Fieldwork in Geography: Reflections, Perspectives and Actions

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Fieldwork in Geography: Reflections, Perspectives and Actions

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Cover illustration: A scheme for applying the experiential learning model to environmental education in the context of neighbourhood improvement as part of environmental education in Vaasa, Finland. The planning cycle is enhanced by the use of various enabling methods and by a self-assessment system. Diagram adapted from that of Horelli (1997: 111).

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This volume is dedicated to the lifelong leadership that Yee Sze Onn has given to making fieldwork a central component of Geographical Education.

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PREFACE

The International Geographic Union's Commission on Geographical Education supports enthusiastically the important role of fieldwork in the life long geographical education of people around the world. Fieldwork is promoted strongly in the *International Charter on Geographical Education* and is reported on regularly in presentations to the various conferences held around the world sponsored by the Commission on Geographical Education.

However, in many countries at the end of the twentieth century, fieldwork is either threatened as a learning strategy and experience or not promoted in educational institutions because of factors such as time to cover comprehensive curricula, financial constraints, legal issues and commitment by educators at all levels. In a non-formal sense, fieldwork is thriving through leisure and tourism as more and more people explore the world in their travels. The challenge for educators is to recapture the enthusiasm for fieldwork that is exhibited by tourists and to re-inject it into their curricula.

This volume has been written by a range of internationally-oriented geographers and educators who want to see fieldwork back on its pedestal in formal education so that geographical education for the next millennium can be as a rewarding personal, first-hand experience as it was in the twentieth century. The virtual experiences that educators can now use derived from the advances in communications technologies are important adjuncts to understanding our environments. However, they still do not encourage the development of strong emotions, feelings, attitudes and values towards different environments that fieldwork does. Hence, the contributions in this volume, while pointing out some challenges, do attempt to rekindle the desire amongst educators and the wider community for more fieldwork rather than less. This is a part of a deliberate longer-term strategy by the contributors to promote the powerful relationship between personal experience and environment. If it works, then readers will become advocates for fieldwork for improving geographical and environmental education around the world.

Rod Gerber
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December, 1999

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SECTION 1
AN INTRODUCTION

1. THE POWER OF FIELDWORK

ROD GERBER and GOH KIM CHUAN

Let us imagine that we are located in an environment of our choice. The weather is excellent with warm balmy breezes wafting over the sun-covered landscape. Very few clouds are dotted across the sky and the surrounding environment beckons us to enter, explore and enjoy. The pressure of time is not crucial at the moment and the enthusiasm of the members in our group is matched only by the diverse sounds of bird and animal life in the nearby fields. We are ready to do geography!!

Instead of sitting in a classroom with four walls, we were out in the environment – the real world – experiencing it and making sense of the environmental phenomena over which we traversed. The quality of learning in an outdoor setting remains unsurpassed in the minds of most members of our group, especially when our geography teacher is asking our group of students to apply geographical concepts as a way of demonstrating that we understamd them. By tramping along several tributaries of a stream basin we have been able to see at first-hand how the concept of stream order is sensible and how it is instrumental in explaining how a drainage basin works. This was the only way that most of us were able to appreciate that different orders of streams are characterised by different profiles and that some stream orders are not perennial. Also, by observing the environment from a vantage point with a topographic map of the area in our hands, we were able to understand the location of the railway line and the highway in relation to the adjoining stream and town. The town had been established at the very point where the bridges for the railway line and the highway had been constructed to cross the stream. It had developed as a key transport link by road, rail and water in previous times, but now was a dominant rail transport centre for the surrounding region. Here, we were interpreting a topographic map and making connections between representations in the form of symbols on the map with actual features and spatial relationships in an actual environment.

Geography was not something artificial that teachers and textbook writers had composed for students to study. It was something real in our experience that we would use in our daily lives, as well as in our examinations at school. Geography had relevance to us. We were beginning to realise that by using geography we could defend its purpose in our formal education.

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 3-12.

Within this experience we began to realise that we were learning a great deal about geography without having to go through the pressure of sitting in a classroom and trying to visualise different geographical features and relationships. In some ways we were working backwards in learning geography. Instead of taking visual representations from our textbooks and defining their essential features, we were moving around in an actual environment, observing actual phenomena, describing them or recording information about them in some sensible way in the form of a graphic or a series of measurements, and finally relating them back to the theoretical constructs that take the form of landform features or distinctive spatial patterns. Once we had gone on a field study to a glacial landscape. We had learned about different types of glacial landforms. However, when we faced our first cirque, fiord and tarn they looked quite different from the drawings in our textbook. We needed to move around these features in the field environment to realise that not all cirques, fiords and tarns look exactly the same in different glacial environments. This was not just a case of finding different formations and landforms in an environment, it was very much the case of situating geographical features and patterns in contexts that could be observed carefully from differing perspectives and viewpoints. The field became the situation for learning through direct observation. With the assistance of the facilitative teacher, students engaged in such field studies were able to see these features and patterns with their own eyes, listen to an expert's opinion (expressed by their teacher) on the relationship between the feature or pattern and the theoretical constructs that have been presented in the textbook, and make connections in their own minds by relating the observed features or patterns with the explanations provided by the teacher. The students were able to make their own connections between the geography of the environment that they encountered on the field trip and the uses to which these features might be put. Thus, geography was becoming a useful subject to their lives rather than a school subject per se.

The process of learning whilst on the field study tends to vary from that done in the conventional or technological classroom. The extent of active learning becomes central to the learning process. Our group of students certainly engaged in different degrees of activity as we participating in various enquiry learning activities using a wide range of data in our classroom. Sometimes this involved library research and sometimes it involved using large databanks of information in the form of a Geographical Information System. While most of us were enthusiastic geography students, we seemed to rise to new heights in terms of the learning that we were able to achieve on a field trip as compared to a lesson in our classroom back at school. Somehow, the opportunity to observe different forms and patterns in an actual environment, hear our teacher talk about them in our presence and vision, and then to think about their relevance for human occupancy always produced learning that stayed in our memory much longer and which was retrieved more easily in our minds when we encountered new examples of similar features or patterns.

Why was this so? As adolescents, we certainly did not understand the process of learning as we might do in adulthood. But, we felt that the relationships that we learned in the field were understood more deeply. There were specific theoretical and applied aspects to the concept, pattern or generalisation that combined to produce a stronger intelligent response to the geography being studied. We were not just dealing with a theoretical construct or a series of examples of particular features separately. Instead, we were correlating these theoretical and real aspects about an environment to make realistic connections to our life-worlds.

This process of learning by doing within an environment brings with it more than cognitive responses to environments. Through exposures to different environments during a range of field experiences, people do develop a strong set of environmental values. Field work can definitely promote all learners being able to: appreciate different landscapes; aim for sustainable practices in the use of our environments; value the beauty of environments; practice environmental conservation; and encourage the use of environmentally-friendly strategies when interacting with our environment. These values are not ones that can be forced upon learners and be expected to be translated into human responses. They are developed over time through sensitive interaction between people and their environments. Such interactions can promote positive responses towards environments when they done in a purposeful way in which the students are engaged in some tasks in which they move around in their environment. Through the combination of movement around in the environment and conscious reflection on aspects of the environment, the students come to realise the importance of their environments to human occupancy and they realise that we must act responsibly in regard to these environments or they will not be a part of our world much longer. The students see at first-hand during field trips the results of irresponsible human actions on the environment and often these experiences provides a timely reminder of the need to act positively towards the environment.

One example of the power that comes from doing fieldwork is illustrated in the publication of the results of the survey of land use across the United Kingdom (Walford,1997). After two years of planning by the Geographical Association the third comprehensive land use survey was conducted across the United Kingdom in the northern summer of 1996. (The first two were conducted in the 1930s and the 1960s respectively.) It was as Walford and Morrish (1997:11) say an opportunity for geographers "to seek a practical demonstration of the inherent worth and value of their subject in schools on a grand scale. In this way, despite competing curriculum initiatives and attractions, there would be an opportunity to bring it to the notice of parents, governors and the general public, through a special event."

The objectives of this survey epitomise the value of fieldwork in geographical education and in wider life-long education. The Council of the Geographical Association approved the following objectives:

1. To provide a contemporary picture of the land use of the United Kingdom through a survey undertaken in an extensive sample of one-kilometre grid squares, based on a stratified sample of both rural and urban landscapes
2. To further the intentions of the Local Agenda 21 of the world environmental conference held at Rio de Janeiro in 1992, in which greater knowledge and understanding of the local environment was urged
3. To identify some local, regional and national issues concerning the current use of land in the United Kingdom
4. To discover the perceptions, views and future visions of primary and secondary school students concerning the environments in which they were to survey
5. To provide data on land use in the United Kingdom in the 1990s which can be compared with the data from the land-use surveys carried out in the 1930s and 1960s
6. To emphasise the value of survey work as a preparation for citizenship
7. To give pupils the chance to develop and exercise observation, map, survey, recording and presentation skills as part of their school education
8. To give teachers the chance to demonstrate the interest, enjoyment and relevance of planned, task-oriented fieldwork as part of the educational experience
9. To give schools the chance to focus on geographical studies as a worthwhile and necessary part of the whole educational programme at all ages
10. To promote the objectives of the Geographical Association, a charitable body founded 'to further the study and teaching of geography' (Cited by Walford and Morrish, 1997:17)

The implementation of this survey involved 1500 schools and 50,000 people following precise instructions on how to record the land use data in their assigned local squares. By taking 100 points recorded on the maps using a point-sampling method for each square, some 200,000 pieces of basic land-use information were stored on the land use database. The results showed that arable land had changed percentages from 19.7% in the 1930s to 24.4% in the 1960s to 30.0% in the 1990s. Land used for permanent grass varied from 44.1% in the 1930s to 29.2% in the 1960s to 35.3% in the 1990s. Forests and woodland changed from 5.7% in the 1930s to 8.0% in the 1960s to 11.9% in the 1990s. (Walford, 1997:41)

What did the people who actually did the fieldwork think about the experience? Walford (1997: 69-70) summarised recurring themes as follows:

1. We were a little apprehensive at first, but it turned out fine.

2. The children thoroughly enjoyed it.
3. The pupils gained a great deal – map skills were improved, knowledge of the locality was gained.
4. I anticipate the spin-offs will be as important as the survey itself.
5. It was surprising to find X (or Y or Z) in our square – although this is our local area, we didn't know it was there.
6. This has provoked much discussion about the environment in our class.
7. We felt proud to be a part of a national project.
8. Our intention is to repeat this in subsequent years.

Why did the teachers become involved in the study? May (1997: 115-116) concluded that the main motivations for the teachers were: fieldwork, data collection and analysis. Teachers felt that the Geographical Association had designed an activity that could be used to re-introduce students to the core benefits of doing fieldwork in their local environment. As one teacher said:

> *I'd been thinking about doing some more locally based work, but things like a lack of base maps and structure that was, well, ready-made if you like, had rather held me back, because actually setting something up initially you have got to get a decent map and decide exactly what you are going to do, how you are going to do the categories and so on. But this was sort of on a plate and I thought, well, I'll give it a go.* (Cited by May, 1997: 116)

The main benefits from data collection and analysis were that there was a mass of secondary data that was now available to schools to access and to use when making geographical investigations of their local and other areas in the United Kingdom. Also, this fieldwork approach to geographical investigation brings abstract concepts to life, making them easier to understand. May (1997:121) concludes that one of the most interesting findings to emerge from the research into this national land-use study was the extent to which teachers welcomed a return to a focus on studying local environments. By focusing on local environmental issues the students can develop local environmental responsibilities that will hopefully make them into better citizens.

This example of a comprehensive national fieldwork study contains a variety of messages for any person who plans to implement fieldwork as a part of a geographical investigation. The motivational effects of doing fieldwork cannot be questioned. Fieldwork is infectious when it is experienced in a well-planned learning activity. Fieldwork is certainly enjoyable when all of the activities go according to plan. It is also easy to implement when the study has been planned thoroughly, the participants have been briefed effectively and they observe normal safety precautions when carrying out the field study.

In point four above, Walford mentioned "spin-offs" from doing fieldwork as being as important as the field study itself. He may have been referring to the different uses that can be made from the data that have been collected. However, he is just as likely to be referring to the development of life skills that will develop younger people into more effective citizens who are alert to changes in their local environment and who are willing to take conscious decisions about caring for their local environment. In addition, the techniques and skills that they developed whilst doing a comprehensive piece of fieldwork may well be transferred to other facets of their lives. Hopefully, associated with this life-long development will come the formation of strong environmental values that will colour how each person sees the world around him- or herself.

This is the power of fieldwork in action. We are sure that you will be able to recount more examples of how doing fieldwork in a serious and deliberate way has proved to be an excellent catalyst for learning.

This book makes a conscious attempt to consider fieldwork as a central topic in the study of geography and environments. It does so by focusing on: the power of fieldwork, the foundations of fieldwork, a series of international perspectives on fieldwork, pedagogic aspects, and several considerations for the future use of fieldwork.

The foundations of fieldwork are presented in this book in the form of two essays, by Bill Marsden. Joe Stoltman and Rolland Fraser, into the historical roots in the development of fieldwork and the theoretical understandings of fieldwork in geography. Although Marsden draws heavily on the British scene for his historical development of fieldwork in education he does offer a developmental sequence that may well be evident in other cultural contexts, especially in Europe. Using thoroughly linked sources from the early nineteenth century to the 1970s, he demonstrates how fieldwork developed through progressive nineteenth century influences such as nature study, science, and *heimatskunde* (the study of elements of the immediate landscape); through early twentieth century influences such as world study, the school journey movement, and regional and social surveys; and post-World War Two publications that focused on fieldwork as a central plank in geographical education. These actions have been seminal in the centralisation of fieldwork in the school curricula in different countries.

In the second chapter in this section Joe Stoltman and Rolland Fraser analyse the theoretical understandings of fieldwork by considering intersection of tradition and technology. They do so by firstly considering the usefulness of fieldwork, ie, how fieldwork benefits the education of the students who practice it. Several philosophical tensions are identified which educators should recognise. They include: the tension between scientific inquiry based fieldwork and the humanistic approach; the interpretations of fieldwork and who does "the work" on a piece of fieldwork; and the different outcomes of fieldwork. The importance of inquiry centred learning as a critical

approach to fieldwork is examined closely and supported strongly by the authors based on an extensive range of literature. Modern approaches using recent technologies such as global positioning systems (GPS) and geographical information systems (GIS), permit students to engage in virtual field studies and can process large amounts of data to argument a field study. Collectively, the extensive range of literature and anecdotal evidence leads the authors to include that there may be a resurgence of interest in fieldwork in countries around the world

A series of international perspectives are then presented to convince the reader that fieldwork is being used successfully in geographical studies at different levels of formal education. Four chapters from different corners of the world are presented here to highlight the varying interpretations that have been placed on the use of fieldwork. They reflect the general importance of fieldwork as an important approach to geographical education. Particularly, these chapters reinforce the power that fieldwork does have in different geographical studies in selected parts of the world. In the first of these chapters Lea Houtsonen from Finland demonstrates the importance of fieldwork in environmental education of children. She does so by explaining how children can become planners in their own living environment, how they relate to their local environments, and how through a Nordic environmental education project children can become aware of the conflicts of interest that affect the exploitation of natural resources. She demonstrates a participatory methodology for experiential learning in the field and then demonstrates through an environmental participation project that was conducted on the children's terms how the children can become ecoagents for their environment. Josefina Ostuni from Argentina discusses the irreplaceable experience of fieldwork in geography and geographical education from a South American perspective. She discriminates amongst a field trip, field work and field investigation in so doing as different modalities of teaching in the field. The role of values and attitudes in field work is also highlighted. The challenges faced by doing fieldwork in South American countries seem similar to those faced in other parts of the world.

Goh Kim Chuan and Wong Poh Poh from Singapore present a comprehensive survey of fieldwork in a range of South-East Asian countries. They relate fieldwork to the geography curricula in schools and higher education. While students appreciate doing fieldwork, their teachers and university lecturers feel a range of challenges that restrict extensive use of field-based studies, except for studies of the local environment. While policy documents promote fieldwork in geography and other subjects, the impact of these challenges is having a dampening effect on the extensive use of fieldwork in South-East Asian countries.

The final chapter in this section by Tammy Kwan from Hong Kong, drawing largely from British influences on geographical education, and recent curricular changes in Hong Kong school education, focuses on the ways by which fieldwork has been used in

the Hong Kong school education scene. She also indicates the problems and issues that arise in Hong Kong from doing fieldwork – many of which are so in other parts of the world. There is little doubt that fieldwork has become more widely accepted in Hong Kong geography curricula. However, the discrepancy between intention and practice is a key issue to be faced in regard to doing fieldwork in the school curriculum in Hong Kong. There is a stated need for geography teachers to strengthen geographical education through more integral fieldwork practices.

The next section in the book consists of three chapters on pedagogic aspects that are associated with fieldwork from different contexts. John Lidstone focuses in his chapter on the experience of learning in the field on the need to consider both the teachers and the students. Whilst the centrality of fieldwork in geography curricula is taken for granted, the nature of that experience is variously understood by both teachers and students. Therefore, we need to consider teaching factors, student factors and situational factors when dealing with the topic of fieldwork and learning. One important derivation from this investigation is a set of variations of teachers' conceptions of out-of-class experiences. He reminds us that planning and implementing fieldwork is a complex, negotiational experience that requires a considerable investment by the teachers.

Kwoh Chan Lei draws our attention to learning in the affective domain that can be achieved through fieldwork. He uses a research study in Hong Kong to find out the adventurous element of fieldwork can be used to promote affective learning. He found that adventure-based fieldwork experiences were remarkable for their emotional impact on students. This raised the dilemma for teachers of using affective-focused fieldwork as a means of using fieldowrk for more than intellectual and instrumental learning. The challenge for him is for educators to strike a balance between both types of learning when doing fieldwork.

Ashley Kent and Nick Foskett introduce the topic of pedagogical issues that are associated with fieldwork in the school geography curriculum. They explore a range of teaching and learning strategies in fieldwork in schools, and their contribution to a number of themes of pedagogical significance. In particular, they focus on the links between fieldwork experience and the development of enquiry skills, information technology development, the enhancement of thinking skills, the exploration of pupil attitudes and values, and education of sustainability.

The final section in the book investigates considerations for the future use of fieldwork in geographical and environmental education. In the first of three chapters, Rod Gerber considers how fieldwork can be an important element in people's life-long learning. He explains the links between fieldwork and life experience; how informal fieldwork permeates the lives of many people as they are growing up; how fieldwork can be a vital part in one's work, and for keeping in touch with one's environment. With the huge

impact of the modern communications technologies, cyber fieldwork is becoming an important source of virtual fieldwork. This causes us to think about the concept of fieldwork leadership and how geographers and environmental educators need to act to promote fieldwork learning.

Jim Petersen and Richard Earl point to future uses of fieldwork by reflecting on past and current trends in teaching field methods courses in American universities. They argue that despite many prominent United States geographers making pronouncements over the twentieth century extolling the virtues of fieldwork and the necessity for field methods instruction, the majority of geography undergraduate majors do not take a field methods course. As the result of administering a written questionnaire across American universities, they concluded that the impacts of information technology have produced technical-applied courses that have overshadowed the value of field methods. A range of challenges were identified by university teaching staff that tended to restrict the extent of teaching field methods. Successful field methods instruction requires a blend of traditional skills and concepts with the purposeful application of new technology. Fieldwork increases students' analytical skills, provides them with experience in practical applications and increases their understanding of fundamental concepts in ways that classroom and digital laboratory instruction cannot provide. These benefits make a continued investment in field methods instruction essential for the well-being of American university geography.

Finally, Adalberto Vallega draws the section and the book to a conclusion by asking the readers to consider the use of the results of fieldwork studies as a way forward for geography in society largely through education. He draws heavily on some of the outcomes of the 1992 United Nations Conference on Environment and Development and recent epistemological discourses on the topic of geographical thinking to demonstrate how fieldwork can play a vital role in *Paideia* (education). In the post-modern world in which we live, Vallega claims that through the use of fieldwork and other educational approaches geographical education can contribute more importantly in people's social development by shaping the geographer of the next millennium and by encouraging educational systems to think globally and holistically.

These chapters certainly should encourage all geographers to want to promote fieldwork fully in their formal education at all levels. However, the challenges of safety, school policy, time in a crowded curriculum and legal challenges mean that fieldwork with all of its motivational forces is often not maximised in educational curricula. What is required is a new commitment to fieldwork in all aspects of living to ensure that it can drive the thirst for understanding our local and less accessible environments more fully and being able to use them more effectively. Nagle (1999) reminds us that linked fieldwork and class activities should help students to learn about factors that affect people in a community. Further, Foskett (1997:200) draws these ideas together in his

plea for an increasingly centralised role for fieldwork in geographical education, a plea that could become a rallying cry for the resurgence of fieldwork. He states:

> *Fieldwork in the geography curriculum has been under external threat during the last decade as issues of safety, cost and the internal managerial and curriculum pressures in schools militate against it. There is increasing pressure to use local fieldwork that is accessible within walking distance and, preferably, within single or double geography lessons. However, the value of fieldwork is still clearly recognized by most geographers, and its position, albeit at a potentially nominal level, within the curriculum is assured. With effective planning and management and a commitment to the educational and personal benefits to pupils of fieldwork, geography teachers can ensure that it remains as one of the most significant learning experiences that pupils have during their school career.*

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SECTION 2
FOUNDATIONS OF FIELDWORK

2. A BRITISH HISTORICAL PERSPECTIVE ON GEOGRAPHICAL FIELDWORK FROM THE 1820s TO THE 1970s

BILL MARSDEN

> *L'importance de l'observation directe en geographie n'est pas une decouverte de la pedagogie contemporaine.* (Personne, 1959, p. 68)

2.1 Nineteenth-century Progressive Influences

The impact of progressive educational influences from Europe was already evident in the thinking of British pedagogues in the first half of the nineteenth-century. The progressive philosophy was based on the principle that book-learning should be delayed, and that the early years of learning should rely on first-hand experience in familiar surroundings. Thomas Wyse, whose work was celebrated enough to merit an annotated version in the United States, was writing in the 1830s of the rudiments of geography being

> *already learned in the daily walk. A child sees all the definitions which load our geography catechisms and grammars, far better in the open page of nature, than in books '* (See Foster, 1837, p.35)

HMI Moseley, in reporting to the Committee of Council on Education in 1845, lamented the mechanical teaching of geography and the miserable quality of textbooks. The first step in a child's education should be to 'teach him to observe', to acquire knowledge and understanding of 'the characteristic features of that portion of the earth's surface which is within the compass of a day's journey'. (MCCE, pp. 235) There was to be sustained support for this position in the second half of the century. Jelinger Symons recommended going 'step by step from the best known to the less known' (1852, pp. 98-9), a position reinforced by the Scottish educationist James Currie:

> *His own neighbourhood supplies the materials on which the whole is grounded; his observations of it shows him the elements out of which all landscapes whatsoever are constructed... The stream which flows through the village common, with its pools and bendings and eddyings, will help him to realize the other rivers of his own country, on whose bosom the tall vessel conveys the*

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 15-36.

> *wealth of foreign lands; which, again, he will expand into the mighty current of the Amazon or Mississippi...* (1861, pp. 429-30)

Harding echoed this view, stating that the children should observe and learn to describe all the local features 'then be led to fancy each hill they have spoken of increased to a mountain, each stream to a river, each village to a town', and so on. (1872, p. 54) Bain affirmed that it was 'from some commanding eminence that a pupil should receive first impressions of geography (1885, p. 273), while Laurie pithily ruled: 'Teaching, like charity, should begin at home'. 'What a happy chance' he stated, somewhat ambiguously, 'is afforded to a paternal Board of giving the children a day in the country at the expense of the rates, on the plea that the excursion is a geography lesson!'. (1888, pp. 96-7) 'The best book of geography is the face of the earth itself', insisted Her Majesty's Inspector W.H. Brewer in his 1878 Report on the Blackburn District (RCCE 1878-9, p. 512), a view already anticipated in the Revd. G. Steele's 1876 Report on the Preston District. The effective teacher would

> *seek his illustrations first of all from local objects of interest, physical or historical, which are familiar to the children. I have seen Preston boys receive quite a new sensation on being told that when they walked up the river and saw the Darwen run into the Ribble, they had before them what the geography books describe in mystic terms as a "tributary" and a "confluence".* (RCCE, 1876-7, p. 577)

How widely and genuinely the rhetoric was translated into practice can only be conjectured. There was some documentation of progressive practice. At Bruce Castle School, Tottenham, geography began 'in the very room in which the class is taught', involving the making of ground plans of the room, then of the school building, then of the school neighbourhood: 'the pupil is gradually rendered familiar with the conception of greater and greater magnitudes and distances'. There was, however, no direct statement that this local map study extended into work outdoors. (Anon., 1837, pp. 16-7) Similarly at Hazelwood School near Birmingham, Thomas Wright Hill and Matthew Davenport Hill also based the geography instruction firmly on plans and maps, first of the classroom, and then of the immediate surroundings of the school, before progressing to maps of up to twenty-five miles around. Physical features were first illustrated from the local region. (Wise, 1948 p. 20)

Another writer of the time, W. Frend, cited as an example of an 'ideal approach' to geography the use of a model of the town in the classroom, being linked with maps to work out the features of the area. In addition he wrote of associated excursions 'on horseback or on foot in the environs of the town' making the work in the classroom 'very easy and pleasant to them'. (1832, pp. 47-8)

2.1.1 THE INFLUENCE OF NATURE STUDY AND SCIENCE

Under the sway of religious instruction, both geography and nature study were regarded as mere tools, there to reveal the glories of God's creation. In Sarah Trimmer's view, 'the great Book of Nature' proved 'the existence, the power and the goodness of God on every page...' (See Marsden, 1997, p. 5) But progressive nature study, like geography, necessitated outdoor work, and under the influence of pioneering teachers became more authentically scientific. For example, Richard Dawes, teacher at King's Somborne School, Hampshire, was an exponent of 'the science of common things', that is of things connected with the every-day concerns of normal life, likely to interest children at present and for the future. Careful observation of natural phenomena through outdoor work was practised. 'Geography was taught in relation to the locality and to the observations of the sky and the weather made by the children in their scientific work'. (See Ball, 1964, pp. 62-4)

Not all the early progressives approved the focus on the familiar, however, among them Robert Owen at his famous New Lanark School. His infants were from an early stage taught the features of other countries in comparison with their own.

> *The minds of the children are thus opened, and they are prevented from contracting narrow, exclusive notions, which might lead them to regard those only as proper objects of* sympathy and interest, who may live in the same country with themselves... (See Silver, 1969, p. 158)

2.1.2 THE INFLUENCE OF *HEIMATSKUNDE*

An important influence on later nineteenth century geographical thinking in Britain was the continental *heimatskunde* approach. It was illustrated in an Austrian case study printed in the Royal Geographical Society's 1887 Report (the so-called Keltie Report) on the unsatisfactory state of geographical education in England. Here, geography teaching began locally with 'the elements composing the immediate landscape and forming the elements likewise of geography.'

> *The neighbourhood, then, must serve as a measure and standard of comparison for the distant, offering as it does an image of the same arrangement and the same relations... We arrange the features of the neighbourhood we survey, say, from a mountain, according to their succession around the horizon...* (Royal Geographical Society, 1887, pp. 116-7)

Other educational methodologists of the time were enthusiastic about the *heimatskunde* type of study, like Keltie, travelling in Europe to find out more about its procedures and

potential value. One of these was George Combe who extolled the school excursions he witnessed. The pupils

> *...I may say without exaggeration...acquire in the course of a single forenoon, a greater amount of useful, practical and entertaining knowledge than they could in six months at a grammar school...How different were my feelings, when thus employed, from those which tormented me in that place of misery, the High School at Edinburgh.* (Quoted in Jolly, 1879, pp. 453-5)

At the same time the Scottish earth scientist, Sir Archibald Geikie, was seeking to change the face of geographical education in schools. In his ground-breaking *The Teaching of Geography* (1887), he strongly advocated the progressive philosophy in general and the *heimatskunde* approach in particular. 'A fact discovered by the child for himself through his own direct observations becomes a part of his being...'(1887, p.8) Geikie's training as a field geologist had a critical influence on his thinking. He recounted that his first fossil collecting excursion as a child in Edinburgh had left him with a sense 'of the enormous advantage which a boy or girl may derive from any pursuit that stimulates the imagination.' (See Marsden, 1979, p.44) In a section on 'Lessons Out of Doors', Geikie outlined the advantages of fieldwork:

> *It is hardly possible to overrate the benefit that arises from this co-operation of teacher and taught in the open air. The restraints of the schoolroom are suspended without giving way the licence of the playground...A teacher full of love for Nature, and ready to share his love of it with his scholars, is sure...to kindle in all of them a respect and in some of them a love for the objects of his own affection... by directing their eyes to the outer world and leading them to take reverent heed of what may there be seen, he fills their minds with a healthy influence, while at the same time he powerfully stimulates their powers of observation and deduction, and thus contributes in a most important degree towards their education.* (1887, p.17)

The overlaps and the tensions between geography, nature study and the new science of physiography exercised the minds both of geographers and scientists at this time. Huxley supported Geikie's view of the integrative value of fieldwork. His highly regarded *Physiography* text, sub-titled *An Introduction to the Study of Nature* (1877), triggered a new field of study in schools and in higher education. Physiography was even accorded inclusion as an optional subject in the late nineteenth century government elementary school Codes.

2.2 Diverging Directions in British Geographical Education

The last two decades of the nineteenth and the first of the twentieth were a critical period in the development of British geographical education. The Keltie report led some

influential headteachers in the secondary sphere to cautious support of the view that geography was an academically acceptable subject. The Royal Geographical Society expended considerable efforts on promoting geographical education, a role to be taken over by the Geographical Association (GA), established in 1893. The fact that geography was regarded as one of the key patriotic subjects, its status rising considerably as the apogee of imperial sentiment was reached in late Victorian and in Edwardian times. At tertiary and soon to be at secondary levels, the genius of Mackinder and Herbertson in offering schemes to unify and raise the respectability of the subject in the period between the mid-1880s and mid-1900s, established what has since been widely regarded as a new paradigm, namely the world's natural regions as the overarching conceptual framework in the subject.

2.2.1 GEOGRAPHY AS WORLD STUDY

But the success of their efforts was to an extent schismatic, diverging from the line of development advocated by Geikie. Mackinder was critical of what he regarded as Geikie's unbalanced devotion to physical geography and geology. In his famous paper 'On the Scope and Methods of Geography', he stressed the unity of the subject in inter-relating its physical and human elements. (1887, pp 146-7) Additionally, he wrote a fairly critical review of Geikie's *The Teaching of Geography.* While approving the book's stress on scientific observation, he clearly felt its integrative methodology too generalist and less than specifically geographical, condemning its inclusion of 'many subjects which even the most grasping geographer would scarcely claim as his.' (See Marsden, 1979, p.44)

The early volumes of the *Geographical Teacher* (later *Geography*), the journal of the Geographical Association, offered regular advice to teachers on how to conduct field excursions. For example, Lucy Reynolds, teacher at a private school in Kendal, vividly outlined the benefits which had accrued from taking her girls on a residential visit to the Lake District, 'yoking their spontaneous activity and loving of seeing and doing as powerful motive forces...'(1906, pp. 152-3) Her sister Joan Reynolds, on the other hand, was concerned about the problem of the towns. She reflected a strand of opinion which saw the main value of fieldwork as getting children out of the physically and morally polluted atmosphere of their urban environments. 'That great question of our towns comes to the front so often when we attempt educational reforms' (1901, p. 33) The polarized stereotype which counterpointed the ill of the town with the good of the countryside was powerfully fixated in the minds of the general public and of professional educationists, including Professor Findlay who, while agreeing on the necessity for outdoor work, was explicit in his concern over the 'misfortune' of children living in inner cities.

> *If, alas, he lives in a great town, and his school, instead of being placed near a park or in the suburbs, is shut out from communion with the purity and fresh air of the world as God designed it, he needs still more to be taken...to see and feel what Nature is.* (1902, p.160)

This widely felt but somewhat defeatist attitude was countered in later articles by, for example, Orford (1906) and Ellen Smith (1907), two practising London teachers, Smith admitting that inner city schools were 'sorely handicapped' but urging that the difficulties were not insurmountable. (1907, p.64)

There were in addition more negative forces which found the notion of field-work educationally problematic, too pleasurable by far, and likely to incite indiscipline. (Harrison and Hunter, p.v) Even famous geographers who shared this view, including Professor Lyde, who objected to outdoor study on the grounds that teachers could not afford the time for preparation, the boys 'regarded it as a picnic', while 'the road to knowledge' must not 'appear too easy'. (1912, pp. 200-1) A later and perhaps more telling objection was derived from a pupil interviewed by MacMunn. He quoted a ten-year old offering the opinion that while 'to begin with your own neighbourhood...might interest a few', it also kept you from 'wanting to find out all about the world'. MacMunn doubted whether the placing of the local post office in 'its proper relationship to the nearest public house' truly gave insight into 'the lie of the world.' (1926, p. 94)

While it would be entirely unfair to state that the Geographical Association did not pay attention to field study, it certainly did not regularly light up the pages of its journals in the inter-war period. Perusing the Association's *The Sir Dudley Stamp Memorial Index to Geography* (covering also the earlier *Geographical Teacher*), based on the journal from its first edition in 1901 to 1969 (Jay and Todd, 1974), it is clear that there was a spate of articles on fieldwork in the early volumes, before World War I, fifteen articles in all. But the number between the wars, a period of almost twice the length, was only nine. In fairness, there were an additional nine titles on the analogous regional survey, which many geographers at this time supported as a more academic approach to field study than the outdoor excursion.

Similarly, while Mackinder and Herbertson were not unmindful of the value of fieldwork, its espousal was not their highest priority. It was a means to an end. Herbertson was preoccupied with the disseminating the world's natural regions framework. Local geography he regarded as a means first of fostering local patriotism, then an affection for country and Empire, and that of a citizen of the world. (See Jay, 1979, p.88) In articles in the *Scottish Geographical Magazine* on of the value of geography before the natural regions framework appeared, the stress was on map reading at different scales, and on the practical and vocational worth of the subject, rather than on fieldwork as such. (Board of Education, 1896)

Fairgrieve also emphasised the critical importance of mapping skills, and acknowledged the value of using the school and its surroundings in this respect. Children would naturally acquire simple geographical facts and ideas from their home neighbourhood. But real geography began as pupils gained an understanding of how people in simple societies overseas lived. (1908, pp. 247-9) Before the age of seven there should be no formal geography, at which time youngsters should 'merely soak in their surroundings by means of their footsoles and their eyes'. The value of early nature study as a lead in to geography was acknowledged. But 'the geography of children of seven to eight should be the geography of the world', first studying child life the world over, then, from eight to nine years, of adult life, before proceeding to deal with the British Isles and the world's continents. Thereafter, the value of home geography, like world geography, was as a basis of citizenship training. (Fairgrieve and Young, 1922, p. 702 and p. 793) Significantly, Fairgrieve did not use the terms fieldwork or local survey in his famous methodological text, *Geography in School*: rather 'home geography'. (1926, p. 251ff).

> *I start with the axiom that geography deals with neither more nor less than the world; the geographer's parish is that of Wesley. One of the very fine advances that has been made in the last twenty years lies in the acknowledgement that all geography is world geography and that, for example, England studied by itself is not geography at all.* (Fairgrieve, 1927, pp. 235-6)

2.2.2 COWHAM AND THE SCHOOL JOURNEY MOVEMENT

While Mackinder and Herbertson and their followers established what became a dominating paradigm in British geographical education, at least at tertiary and secondary levels, this did not extinguish either traditional capes and bays teaching on the one hand, nor more progressive influences on the other. The spirit of Geikie lived on. An alternative geography was fashioned, regarded by many as more suitable for the primary sector. It was helped in the first place by the Board of Education's approval of the object lesson approach. The Board insisted that if practised authentically the teacher must have, in the classroom tangible objects that appealed to the senses. It naturally followed that for more exotic objects children should be taken to museums to study, for example, the camel or the elephant, and on field excursions, on the grounds that many objects needed to be seen in their natural surroundings. (Board of Education, 1896, pp. 73-74)

Geikie's natural successor in the promotion of outdoor work was Joseph Cowham whose text *The School Journey*, subtitled *A Means of Teaching Geography, Physiography and Elementary Science*, came to be regarded as a definitive statement by supporters of the school journey movement. Cowham had organized journeys for his Westminster College students from 1877. He maintained that at whatever level

journeys were conducted, they must be intellectually demanding, involving more than enjoyable outdoor experience and basic observational tasks, and build in an enquiry process which attempted 'to trace the deeper connections of causal relationship' between the objects studied, ranging from 'striking and obvious associations to more subtle connections'. It required the exercise of higher faculties such as imagination and reason. The results of this work should generate the ability to apply understanding of these relationships to new cases back in school. (Cowham, 1900, Preface)

The successful expansion of school journey activity depended on at least a degree of official support. The Elementary School Regulations of 1895 had given somewhat cautious consent for visits in school hours to museums, art galleries and other institutions. The Code of 1905 went much further, allowing, in addition to visits, school journeys during school hours to places of educational value or interest, subject to certain provisions. It insisted that some local study, including inside the towns, should be undertaken. An example of the impact of the Code can be illustrated from the scheme of work planned for children of about seven years of age at Holy Trinity National Schools, Southport, in 1906. It began with a plan of the schoolroom and the position of other rooms, then of the town. Local subjects of study were parks, buildings, churches, railway stations and principal throughfares and streets, the suburbs of Southport and surrounding villages, and Old Southport. The work moved on to nearby towns and cities and, ultimately, in Term 3, to child life in other countries, and 'things brought by ship to Liverpool from foreign lands'. Obviously much of this could be studied in the classroom, but the log books of many elementary schools at the time record local outdoor study work.

The Board of Education treated this area seriously, while aware of impending cost implications if school excursion enterprises took off. Still regarded as a powerful antidote to the corrupting influences of town life, the idea of rural fieldwork both as a contribution to health and moral education, as well as for its intellectual benefits, was strongly supported in one of the Board's 'Special Reports on Educational Subjects'. It included a memorandum by J.E.G Montmorency on 'School Excursions and Vacation Schools' (Board of Education, 1907, pp. iii-iv), which proved a powerful stimulus to the school journey movement, in its early stages of growth at that time.

In 1908 the Board of Education made a further concession, allowing grants for time spent in school camps and open air schools designed for the improvement of health. Parents had to defray the cost of such journeys, which discouraged some Local Education Authorities from supporting them. Ways of helping were found, however. The London County Council (LCC) in 1909, for example, voted to offer £100 for the educational costs of school journeys, providing supply teachers to replace those who travelled, offering grants for special equipment, and for the travelling expenses of teachers.

H.A.L. Fisher was an advocate of school journeys, and his Education Act of 1918 allowed Local Education Authorities to pay not only educational charges, but also the whole cost of board and lodging and travel of children and teachers. The problem was the journeys had to be offered free to pupils and parents. Despite the effects of the so-called Geddes axe, signalling large government cuts in educational spending in a time of economic crisis in the early 1920s, progressive authorities reinstated grants. The LCC produced a useful guide book of suggestions, entitled *School Journey*, which emphasized their educational and recuperative benefits. By 1936, the LCC had supported 378 such journeys, and paid over £15,000 towards the total of the £36,500 cost. (Hollick, 1936, pp. 11-12)

The growing appeal of school journeys had led to the formation of the School Journey Association (SJA) in 1911. (See Marsden, 1998) Its aims were:

- To advocate the school journey as a desirable factor in the education of the child.
- To promote the collection and interchange of information relating to the organization of school journeys.
- To bring to the notice of the Board of Education and Education Authorities suggestions designed to facilitate the promotion of school joumeys.
- To obtain special concessions from railway companies, caterers, and those in charge of places of educational interest.

The Association's supporters counted school journey activity as within the ambit of progressive education. It included but went beyond geographical field study. They counterpointed the value of outdoor work against the limitations perceived of the classroom, and of single subject teaching via the textbook. The project method was seen as closely related to outdoor work – 'an essential and welcome corrective to the study of "subjects"', and to 'the acquirement of inert ideas rather than of living knowledge'. (Blake, 1936, p. 19) Hollick indeed introduced the integrative term 'environmental study' , which he saw as having particular value in the curriculum for the fourteen to fifteen year old. (1938, pp. 6-7)

Within Britain, while most of the school journey centres were located in the rural south, this was primarily an urban movement, designed to transport children out of the cities for short periods of time into the rural world that was seen to have been lost. The majority of members of the Association were based in the London area, and in Lancashire and Yorkshire. (Morris, 1939, p.19) One of the most important endeavours of the SJA was the organization of school journeys to European countries. (Hollick, 1938, pp. 6-7) The mission statements of the movement widely stressed the contribution of school journeys

to international understanding, each participant seen as 'a potential ambassador for peace.' (Anon., 1937, p.277)

G.G. Lewis, one of Cowham's Westminster College students, was the persevering scribe of the school journey movement over three decades. From the late 1890s Lewis implemented Cowham's ideas, and particularly following his appointment to the headship of Kentish Town Board School in 1906. The success of his expeditions also encouraged him to offer guidance for his peers in books and in the teachers' press. Before the pre-First World War he produced three books: *Typical School Journeys* (1909), *A Scheme of Nature Study and How to Work it* (1910), and *Longer School Journeys* (1911).

While the work further afield no doubt included a 'Cook's tour' element, it was also very practical. That on Hampstead Heath included measurement of the flow and width of the River Fleet. (Lewis, 1905, p. 785) Lewis had a creative mind. For an excursion to the Heath, for example, he introduced a simulation activity, based on the theme of 'Colonisation', in part as preparation for later historical work on the colonies. One of the Hampstead Ponds represented the ocean, and the boys had to select a suitable place for a landing. The only sensible choice was the point where the Fleet entered the pond, suggesting a site on a navigable river. They had to assume there was no element of civilization, and therefore needed to make a camp fire and then explore the surroundings. They decided on how they would acquire food, fuel, and so on. Finding a piece of coke suggested there was a coalfield in the area and gold too was discovered. But there was little food, so the gold miners of the interior were compelled to go back down river to the coast to exchange gold for food. They soon realized that a transport system would be needed to make possible the regular exchange of goods. Planning the railway connection was the next task, and two 'engineers' were sent out to see how the hilly land could be negotiated, and what cuttings and tunnels would be required. This was associated with the making of a map, which showed that a circuitous route through a gap in the hills could be built to connect the port with the coal and gold producing areas. Then a new range of ideas was provoked by imagining a second set of colonists. For this set, children had to choose a job, and judge which would or would not be useful to the new colony. It would seem that Lewis suspected that such work was in advance of its time, for he somewhat defensively suggested that this activity might be seen too much as an organized game rather than real geography. (Lewis, 1909, pp. 47-8)

A notable feature of Lewis's procedures was his insistence on the provision both of a school record of journeys for the child, and the keeping of a record for the school, which would become part of its history. One of his mottoes for field-work was to concentrate on sitting and sketching rather than walking and talking. Watching in silence for a number of minutes was a vital skill for nature study, and an aid to concentration. He also insisted that in collection activities nature should be respected, and forbade wanton

picking and discarding of flowers, or the inappropriate treatment of animal life. (Lewis, 1926, p. 293) A proponent of visual education, he stressed the special importance of compiling a photographic record. Many of his articles included photographic illustration. In Lewis's own words: 'The camera is the best friend of the teacher in making a record of his work in most departments of school work, but in none does it prove so valuable as in the school journey.' (Lewis, 1929, p. 1151)

An article for *Junior Teachers' World* in 1933 included what was in effect Lewis's testament, directly in the line of the progressive thinking of his predecessors, Geikie and Cowham.

> *I believe in the school journey because it kills more birds with its stone than any other weapon in the educational armoury ... I believe in it because it is a labour of love, bringing into interested co-operation and sacrifice teacher, parent and child, manager, doctor, nurse and people of all classes in the district visited ... I believe in my own special weapon because it will influence all the future holidays of the scholar..., training for the intelligent use of leisure...I believe in it also as a health-giving holiday... the over-fat child sheds pounds of surplus ... the under-fed wax fat ... Most of all do I pin my faith to the school journey for bringing town and country, poor and rich into contact and better understanding ... The Dean or Canon who in his mind has muttered "Godless board school" changes his opinion when he finds our children asking keen questions on church architecture ... I believe most hopefully in the Continental journey ... This is the most practical path to international amity and the will to peace.* (Lewis, 1933, p.37)

There seems to have been little contact between the SJA and the Geographical Association. Only two of Lewis's many publications appeared in the *Geographical Teacher* (1920). The thrust of Lewis and other colleagues in the SJA was towards the integrated view of curriculum planning, whereas the Geographical Association was more concerned with the specialist focus of the secondary school geography, now firmly re-established as a world study. There is certainly some evidence of tension with geography teachers, Ernest Young, for example, suggesting that outdoor work need not be of the 'elaborate character made familiar to us by the enterprises of the School Journey Association'. (1925, p.62) It may well be that the geographers viewed the school journey idea, especially that abroad, as not sufficiently academic, as attested in a comment from the Incorporated Association of Assistant Masters, representing mainly secondary grammar school teachers, which considered true fieldwork on 'a very different plane' from school journeys or excursions, 'which convey thoughts of happy holidays and days of relaxation..' Members of the Geographical Association later appeared also to give more attention to the work of the Youth Hostels Association, even

though the SJA was seeking to establish hostels of a broadly similar type. (See Fawcett, 1933)

2.2.3 GEDDES AND REGIONAL AND SOCIAL SURVEY

During the 1890s Professor Patrick Geddes established the Outlook Tower in Edinburgh as

> *a place of outlook and as a type-museum which would serve not only as a key to a better understanding of Edinburgh and its region, but as a help towards the formation of clearer ideas of the city's relation to the world at large.*

Such understandings were seen as essential to the geography and the historian, and to the artist, the scientist and the social worker. (Anon., 1906, p. 268) First a geographer, and later a sociologist, Geddes 'brought to bear on human problems the evolutionary biological outlook'. He drew on Le Play's notion of the fundamental determinates of society being place, work and family, the last of which Geddes referred to as 'folk'. His major contribution to education was the idea of the regional survey, a kind of stock-taking of an area, a necessary precursor to planning for a better future. (Rudmose Brown, 1948, pp. 110-111)

Geddes' conception was taken up by, among other bodies, the Civic and Moral Education League, which established committees for the development of regional survey, which promoted regional survey type studies of particular towns by local secondary schools. (Anon., 1917, p. 157) Regional survey also became a popular activity with adult education institutions, including the Workers' Educational Association. (Madeley, 1920, frontispiece) A Scottish Regional Survey Association was formed which in 1922 issued an advisory pamphlet on *The Regional Survey Method in Education*. (Honeybone, 1953, p.4) A Le Play Society was established in 1930 (Beaver, 1962, p. 234), strongly supported by followers of Geddes, among whom were Fagg and Hutchings, whose *Introduction to Regional Surveying* (1930), drew together work in science, geography, history and social study within a region. They pointed out that the most elaborate regional survey had essentially a 'prototype in the child's investigation of its immediate surroundings' (pp. 1-2). They postulated the emergence of 'a better social order through such work, 'when the results of scientific research in regional sociology can be applied to the arts of citizenship and administration'. (p.143)

Another follower of the regional survey method was Charlotte Simpson, whose books *The Study of Local Geography* (1934) and *Making Local Surveys* (1951) were strongly infused with this approach. The final aim was developing 'an eye for country', the sub-title of her later book. She very much saw local surveys as a contribution to heritage education, laying stress on developing respect for the landscape through learning to

distinguish the 'harmful, useless or ugly' from that seen as worth preserving. (p.1)Geddes's famous valley section model of a region from mountain to sea coast, with its associated sequence of occupations and settlement, was an educational inspiration not only to geographers but also historians, for the framework could be applied to such a landscape before and after the industrial revolution. (Madeley, 1920, p. 63) This heritage aspect appealed not only to Madeley and Simpson, but also to another historian, Randall, who regarded the face of the countryside as 'the most important historical document that we possess.' (1936, p. 1)

Not all teachers took the same view, and indeed definitions of what regional survey implied differed significantly. In a series of articles in the teachers' press the nature study specialist Richard Morse saw the survey method as 'a complete and scientific study of the region from every point of view'. Morse's plan of campaign was largely scientific in its early stages, covering the region's geology, weather, relief and drainage, and vegetation, coming to human development and the influence of the physical environment and historical change on it last. (1930, p. 1160) The schemes of elementary schools were integrative, and many offered their particular variant of regional survey implementation, to the teachers' press by way of example, in some cases to win weekly prizes offered. Thus one from Dunmow Council School covered rural science, geography, history, mathematics, handicraft, and follow-up laboratory work, and ended with the teachers' writing up q 40,000 word book, including many maps, photographs and diagrams of their region. (Skellon, 1933, p.852) A particularly telling illustration of success in a local authority was the celebratory Staffordshire exhibition of up-to-date geography teaching of 1934, in which outstanding examples of local fieldwork and more ambitious regional survey from various districts of the county were exhibited. (Stembridge, 1934, p. 22 and p. 37)

Geographers, historians and scientists were not the only contenders for the soul of regional survey. Progressive educationists insisted that it was not a new subject, but an educational process, an idea which had been 'grossly misrepresented' and indeed 'belittled'. The content of the work was defined by the area to be studied, but that should be related to all the areas of the school curriculum, including obviously nature study, geography and history, but also arithmetic, English language and literature, drawing, folk-songs and dancing, handwork and gardening. It stimulated the child's inherent faculty of observation, to the end of fostering 'a natural spirit of investigation and enquiry', and contributed to 'all that goes into the making of an ideal citizen of an ideal community.' While regional survey did not entail the wholesale abolition of textbooks, so long as well written, it showed how partial was the knowledge to be gained from them. (R.M., 1920, pp. 177-8) .

Perhaps the crowning glory of the geographically promoted side of regional survey was the Land Utilisation Survey of Britain of the early 1930s, an idea in the first place

promulgated by the Regional Survey Committeee of the Geographical Association, and led by Dudley Stamp. It was extolled in *Junior Teachers World* as the school children's 'great gift to the nation', a school cartographers' triumph vindicating modern education. Every acre of Britain was surveyed and recorded on 6" Ordnance Survey maps. Beginning in 1930, about 80% of the work was undertaken by schools, and planned on a county basis. Obviously the final versions of the survey were undertaken by professional cartographers, and the maps published by the Ordnance Survey. Apart from the new knowledge engendered, the idea and the value of regional survey was disseminated to non-participating schools, and novel activities worked out for geography teaching based on the survey sheets. (Willatts, 1935)

One of the most far-reaching illustrations of Geddes's influence was the acceptance of the idea that, while regional survey would take town children out into the country, there remained a whole field of social survey waiting to be undertaken inside the towns and cities. One of the seminal applications of the concept of the town as an organism embracing place, folk and work, was Penstone's *Town Study* (1910). Headmistress of a London secondary school, she argued that the urban environment was a vitally important object of study for the city child. As Geikie had stressed, even in the dreary city suburb there was much of educational interest. It contained one of the most striking incitements in the history of fieldwork advocacy.

> *But we do not end wish this urban environment to remain as it is. Because men live in towns there is no reason why these towns should for ever become more overgrown, squalid, and devoid of interest. To draw the child's attention to the town itself and its features is one of the best ways of bringing about interest, enlightenment, and a divine discontent (my italics) which may result in great improvement in urban life. It is one of the most important tasks of education to remove that mist of familiarity which blurs all features together, and makes us, through sheer inertia, acquiesce in the accustomed and the comfortless.* (p.2)

While radical as an educational concept, the Penstone's mission included stringent moral underpinnings. She defined town study Penstone as an introduction to the study of civics, to be used as a training in civic responsibility, local pride, personal betterment and a national patriotism, in the spirit of William Blake. Rather than diverting town children to a reactionary movement extolling rural life, the idea should be arouse the interest of the citizen in public affairs, and make him or her fit to serve the country. (pp. 9-13)

Most of the energy channelled into fieldwork excursions between the wars was, however, associated with rural fieldwork or visits abroad. In the late 1930s Cons and Fletcher broke with this trend, and returned to the theme of local fieldwork in the urban environment. This was as part of a social education initiative, detailed in their *Actuality*

in School text (1938). They sought a 'new intimacy' between the urban school and its neighbourhood, urging that the experiences of children coming to and from school should be a basis for school activity. The neighbourhood was their public world and should be used to stimulate interest. The school should bring the pupils into direct contact with local people who served them, such as postal, police and milk delivery workers.

Two other late 1930a advocates of 'reality in geography' in both town and country were J.B. Dempster, a Dulwich geography teacher, and Olive Garnett, a geography lecturer at the Froebel Educational Institute. Dempster's ideas were well in advance of their time, and included studies of historical changes in land use, comparing tithe maps with land utilisation survey maps of nearly one hundred years later, traffic counts processed by means of proportional circles, and in general the techniques of regional survey. (1939, p. 219) Garnett, like Geikie before her, argued that there was a close similarity between the methods of the academic field researcher and activity-based school fieldwork. She also advocated children being taken not only to experience scenes of harvesting, or observe country landscapes, but also the construction of a road, the excavation of the foundations of a new building, the arrival of fishing boats, and so on. She regretted, however, that so few schools undertook work outside the school building. (1940, pp. 171-172) Not least, through such studies the children would become aware of the rapidity of urban change. (Garnett, 1934, p. 314)

Another teacher conducting socially-oriented local urban study on either side of World War II was Edith Coulthard. In a Geographical Association report on local studies in 1938 her work in Bishop Auckland was cited as an example of such work being conceived as an education in citizenship. (p.178) It included a town planning element. It was made explicit that this was an application of a principle laid down by Fleure, then Professor of Geography at the University of Manchester and a contributor to the work of the Association for Education in Citizenship.

> *Whatever other qualities are needed to make a good citizen, a loving familiarity with and at the same time an objective understanding of the home region are essential. The attitude of mind developed by the study of the home region should lead to enquiry and reflection upon means of preserving what is best in the region's heritage, of rectifying mistakes, and of planning for future generations so as to develop possibilities of a good life for all.* (Fleure, 1935, pp. 68-9)

2.3 Post-World War II

The Second World War proved to be a body-blow for the School Journey Association particularly in respect of its foreign excursions. The war also inhibited school journeys within the country. There was, however, some residual advocacy of regional survey,

which could be regarded as useful for evacuated children. (Walton, 1941, p. 102) Then the Council for the Promotion of Field Studies was established in 1943 with the object of encouraging and helping beginners in fieldwork, especially in geography, geology, botany, zoology, history and archaeology, in a sense usurping activities long since practised on SJA excursions. Field Study Centres were located in properties leased from the National Trust, the first being Flatford Mill in Suffolk. (Jensen, 1946) While in most ways a positive step, such centres rekindled the idea that fieldwork was best conducted in rural areas of natural beauty. For some time to come, the prototype sixth form vacation field weeks were conducted from such centres or from youth hostels.

Many were the post-war publications which re-invented the wheel of field fieldwork and school journeying. (See, for example, Flack, 1945) The Association for Education in Citizenship continued to promote local surveys, sponsoring a 1948 text by Layton and White, which defined the local survey as 'a voyage of discovery into the life, history and organisation of the locality.' It emphasised the progressivist view that it should be seen as an approach, aimed 'to bring the individual into sympathy with his surroundings, not passively, but as an active unit...' (p. 1)

At Bishop Auckland, Edith Coulthard continued her work in this sphere, following her historical geography and economic surveys of the town, respectively in 1937 and 1938. In 1946, a 'non-academic' group of one-year sixth formers was used to make a social survey comparing war-time and post-war conditions. The survey covered the geographical setting, changes in the distribution of population and housing, transport and recreation. Information was drawn, apart from the fieldwork, from topographical, geological and land utilisation maps, and from censuses, Ministry of Labour, Board of Trade and local reports. An exhibition was organised. Professor Oliver of Manchester University's Education Department requested that it be sent there to display to stimulate his students to like activity. (1946, pp. 134-5 and 138) Coulthard was soon to be appointed to a post in his department. The Geographical Association, which had published details of Coulthard's innovative work, added support in an article by Briault stressing the need to integrate local study in the geography course. (Briault, 1953)

The post-war editions of the University of London Institute of Education's *Handbook for Geography Teachers* offered more than mere token approval of fieldwork and, not least urban fieldwork (Roberson, 1955, pp. 69-73) But at the same time, Roberson's colleague at the Institute, R.C.Honeybone, indicated that while there had been considerable development of fieldwork, the situation was regrettably similar to that of 1887, when Geikie referred to otherwise good schools as fatally neglecting it. He claimed that there was still an ignorance of the aims and methods of the field scientist, and cited some of the rationalizations used by teachers for not undertaking it, including the age-old one of the difficulties of working in the urban environment. He reintroduced the principle of Geikie and Garnett that good fieldwork should be viewed as 'research at

the child's own level', linking the life of the school with the life of the environment. (1953, p. 5 and p. 10) Increasingly, official bodies saw the light, and many LEAs and even schools were to establish their own field studies centres. The trend was most marked in the 1960s, the number of centres increasing from less than fifty at the beginning of the decade to two hundred at its end. (Hall, 1976, p. 31)

Certainly by the early 1950s university geography departments were resuming fieldwork operations as integral parts of their courses. One of the most passionate academic advocates was S.W. Wooldridge, who in his Presidential Address to the Geographical Association in 1954 laid down the broad principles which should inform fieldwork teaching. These gave precedence to scientifically based physical geographical work, mainly in rural areas. With a degree of dogmatism and in censorious tones, he asserted that the physical basis of the subject was being supplanted by the narrow humanistic and social studies emphasis that he claimed was the dominating culture among geographical educationists in teacher training institutions. These he argued were diminishing the status of geography as a serious academic subject. But in striving to sustain this hostility, he was caught in the horns of the dilemma that his definition of research work in the field was not essentially different from that which progressive educational thinkers would approve. So while he disparaged 'activity' methods as one of 'the popular educational lunacies of our day...ineffably silly, patently erroneous, and intellectually beneath contempt', he had to concede that proper fieldwork was about 'doing' and not about the children being told. (1955, pp. 73-9)

One of the earliest post-war methodological texts was Gopsill's *The Teaching of Geography* (1956), which, while supporting the need for fieldwork, at the same time appeared preoccupied with the difficulties of organising it. (pp.159-60, 1973 edition) Long's survey of the status of fieldwork with the traditional examining boards, the Ministry, and local authorities, indicated increasing but permissive support. Actual implementation depended on the initiative of the individual teacher. (1962, p. 84) The real breakthrough followed the introduction of the new Certificate of Secondary Education (CSE), intended for less able pupils than those sitting the academic General Certificate of Education. All except one of the fourteen regional examining boards of the CSE offered pupils the opportunity of submitting for coursework assessment an account of a field study, and some made this compulsory. (Boardman, 1974, p.158) While traditionalist teachers complained about the logistics of organizing such activity, not least, again, in difficult town schools, the new examination boards stuck to their guns and insisted that if students were to take the CSE examinations they must undertake fieldwork. Of all the stimuli to fieldwork over the previous 150 years, this was probably the most effective.

By the early 1960s most advanced fieldwork was still being conducted in the countryside, based on field study centres and youth hostels. (Marchant, 1964, pp. 180-2)

There was, however, increasing interest from this time not only in traditional Easter fieldwork weeks at rural field centres, but also for in term fieldwork in towns, integrated into the course. Bull offered valuable advice in *Geography* drawing, among other things, on Smailes' seminal *The Geography of Towns* (1953), furnishing a wider variety of techniques than had been practised before. (1964) The era of central place studies, functional regions, delimiting central business districts, mapping suburban service centres, and delineating urban fields through bus services and newspaper circulation had spread into the schools.

The trend was clearly helped by the fact that during the 1960s traditional world regional geography had lost face and was in a state of near terminal decline in universities and, furthermore, one spreading into schools. A more enquiry-based geography was gaining ground, and fieldwork was an important component of this trend. Graves expounded the benefits of direct observation in the field, regarding it as fundamental and indispensable for true geography teaching, in a UNESCO-sponsored *Source Book for Geography Teaching* (1965, p. 73) By the time that Long and Roberson's *Teaching Geography* was published (1966), fieldwork was considered essential in university and college of education geography courses, was increasingly mentioned in G.C.E. syllabuses, and was virtually compulsory in C.S.E. level examinations. The authors regarded it was 'probably the greatest change' in the subject in the post-war years. (p. 121) Their judgement is confirmed by the Jay and Todd index, for between 1946 and 1969 there were as many articles published on fieldwork in geography as in the previous forty-five. (1974) Long and Roberson cautioned, however, against the continuation of traditional methods of fieldwork of the 'Cook's tour' type, in which an expository attitude on the part of the teacher persisted (p. 125), an approach endemic in many of the sixth-form vacation field trips of the time. They saw it ideally as an exploratory study of the landscape 'on the spot', with the teacher as guide and mentor, ensuring the work was well-planned, implemented and followed-up. They readily used the progressive terminology of stimulating a 'spirit of enquiry', looking at the landscape 'with a fresh eye', exhibiting 'insatiable curiosity' and developing 'an eye for country' as key aims. (pp. 126-7) A wide range of advice on planning fieldwork in town and country was offered.

The so-called quantitative revolution provided a further stimulus to geographical fieldwork, emphasis being placed on more objective, deductive, hypothesis-based based pieces of deductive field research, often using statistically methods in the processing of data, contrasted with traditional inductively based observation/recording/interpretation approach. (Everson, 1973, pp.108-110) By the early 1970s, further impetus was given to field study at all levels through the educational promotion of bodies such as the Town and Country Planning Association, and an increasing number of environmental bodies, as environmental studies took off in courses of colleges of education. (See Marsden, 1971) The idea of fieldwork promoting citizenship was reintroduced through the

advocacy of pupils actively participating in town and country planning, following the Skeffington Report on public participation in planning of 1969, at the same time helping to improve the quality of the environment. (Grimshaw and Briggs, 1970, pp. 307-8) Evidence of its growth in popularity could be attested also by the appearance of ten methodological texts solely devoted to fieldwork between 1965 and 1974, while important sections dedicated to the topic appeared in many other educational publications.

By this stage the Department of Education was recording over half of schools as heavily involved in fieldwork at both upper and lower levels, and only 8% undertaking no such work at all. (see Hall, 1976, p. 32) Like its predecessor the Board of Education, the Department lent guarded support to field work. Economic restraint had still to be exercised. LEAs were advised to 'look with an inauspicious eye on plans to conduct expensive excursions to distant places when the resources of the school's immediate neighbourhood remain unused.' (1972, p. 48) A new cycle of anxiety citing logistical, conceptual, pedagogic and social constraints was pending. An interesting facet of Boardman's early 1970s survey was that teachers were not blaming as inhibiting factors points of principle, but those of logistics and internal school politics, citing as problems issues such as school timetables, large class sizes, planning time required, and attitudes of colleagues and headteachers. (Boardman, 1974, p. 162.)

2.4 Conclusion

This historical account of fieldwork in British schools over one hundred and fifty years reveals both elements of continuity and change. Fieldwork has always been associated with what might be called the progressive educational front of geography, and indeed of other subjects such as history and science: even more with integrated primary school practice. There have of course been enormously enhanced opportunities provided both by more sophisticated pedagogical thinking and through technological improvements, but many features in essence remain the same. Few have gainsaid the fundamental value of starting with the home locality through work in the open air, widening this out to further first-hand investigation in other parts of the country and, hopefully, abroad. One ideal of the sample or case studies movement was to recreate as far as possible field study of distant places through indirect observation in the classroom.

Paradoxically, some of the most famous names in the history of geographical education, not least Mackinder, Herbertson, and even Fairgrieve, while accepting the value of fieldwork in the beginning stages, saw it as a preliminary means to much wider ends, whether defined as producing imperial citizens, or internationalists on the great world stage. Countering this were educational progressives, and a series of academic physical geographers and earth scientists, including Geikie, W.M. Davis and others through to Wooldridge. Investigation of the history of fieldwork in British schools is thus revealing

of many of the tensions played out in the internal politics of the subject and in education in general.

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3. GEOGRAPHY FIELDWORK: TRADITION AND TECHNOLOGY MEET

JOSEPH P STOLTMAN and ROLLAND FRASER

3.1 Introduction

Fieldwork has enjoyed a long standing tradition within geography teaching and research. If one were to identify the very basic elements of the discipline, they would include physical geography, human/environment interaction, spatial studies, regional studies, and fieldwork (Pattison, 1964). Those topics largely identify the field of geography as it emerged to become a fully recognized scientific discipline during the 1950s and 60s. Since that period, the discipline has moved forward to embrace ever more sophisticated applications of data collection and analysis, ranging from remote sensing to geographic information systems (GIS). However, the roots for much of the data collection and analysis progress made in the latter half of the 20th century were firmly attached to the traditions of fieldwork and field study that typified the discipline and its students at both the school level and the university.

Why is fieldwork in geography teaching undergoing a period of change? The new technologies available to observe the Earth from different scales are making it possible to study a place or problem in great detail without ever venturing there for first hand observations. The technological question is aptly put by many field geographers who ask: "Is it possible to zoom in on a one-meter square area of the earth's surface and tell exactly what is there?" A combination of work in the field and work with remotely sensed information in laboratory or classroom seems to be the general rule. However, while the field truthing of remotely sensed information is often required, as the models for analysis of remotely sensed information become more sophisticated it becomes less and less essential to visit field sites first hand. This is true at the research level where fieldwork and virtual fieldwork are increasingly viewed as synonymous, and it percolates down to the earlier levels of education. University students preparing to become geography teachers who do not participate in fieldwork will find the involvement of their students in fieldwork less appealing. Similarly, students in the earlier grades who do not engage in fieldwork will miss significant basic experiences upon which to build later interests and skills. Is virtual fieldwork in the computer laboratory the equivalent of field based work? What is it that students obtain from fieldwork that is significant to their later lives and professions?

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 37-52.

In order to answer those questions, one needs to ask, "Why did field study emerge initially as a major component within geographic teaching and research?" The response is threefold. First, geography is an empirical science. The data of geographic research are observations from the real world and largely from the present time (Holt-Jensen, 1980). The best means to collect those data is to encounter them where they exist, in the field outside of the classroom. Second, the process of field study and observation reveals the relationships between elements on the surface of the earth. While an explanation for the those relationships is embedded within the observations, the larger patterns are observable and may be mapped and analyzed (Board, 1965). Fieldwork lies at the heart of geographic question: Where are things located in a particular place and why are they located there? Third, geography is a spatial science that studies the Earth as three dimensional space. Traditional map and photographic analysis were in two dimensions, and only in recent years has virtual reality opened the third dimension. Fieldwork always has the third dimension open, and provides a unique perspective that could not until recently been readily obtained by any means other than fieldwork (Plumb, 1981).

3.2 The Usefulness of Fieldwork

What are the educational benefits of doing field work outside in the environment in a traditional sense? Most traditional fieldwork experiences would include as a benefit the use of instrumentation in applying tools of field research to apply scientific inquiry to an issue or problem, or to an object of interest. In addition to instrumentation, which may employ geographic positioning systems (GPS) and laptop computers with geographical information systems (GIS) software, at least seven benefits that students receive from doing fieldwork have been identified (Gold, Jenkins et al., 1991). They include:

1. Developing observation skills: All students have some skill of observation using their five senses when they arrive in geography class. Fieldwork takes them back in to the same or a different environment and demonstrates the importance of experiencing an environment first hand, as well as the means to hone those senses. More importantly, fieldwork provides the student with experience in developing a geographic perspective in viewing the landscape, both natural and human (Figure 1).

Figure 1: Field work entails close observation of the natural elements, including plant identification either in the field or back in the classroom from leaf samples collected during fieldwork. (Source: David Lemberg)

2. Experiential learning: Fieldwork provides opportunities to learn through direct, concrete experiences. The experiences that one gains in doing fieldwork are closely related to the experiences one will have in a job or life's general experiences.

3. Direct involvement of students in responsibility for learning: Fieldwork requires that students plan and carry out learning in an independent manner. While fieldwork may occur in groups, each person has responsibility for a particular component, thus being responsible for the collection, verification, analysis, and reporting of information. Direct involvement also enhances the development of language proficiencies if the fieldwork is going to be completed in other regions or countries (Figure 2).

Figure 2: Framing used to both identify sample plot and standardize its size for comparison with other plots on which plant, insect, and sediment sampling may be completed. (Source: David Lemberg)

4. Developing and applying analytical skills: Fieldwork relies upon a range of skills, many of which are not used in the classroom. Observation of patterns in nature, or in the built environment, developing plans to obtain samples that are not readily accessible, taking measurements of dynamic processes, and using classification, mathematical calculations, and theoretical models to organize and analyze the observed data are essential in fieldwork.

5. Experiencing real-life research: Fieldwork exposes students to the problems and issues that are faced by people on a regular basis. Not all of those problems or issues are negative and fieldwork can focus on what is working successfully in an environment or the structure of an urbanized region. The important thing is that the fieldwork engages students in the use of "messy" information that they then have to sift through, organize, and use in testing their hypotheses or comparing their research to models of explanation.

6. Developing environmental ethics: Working in the environment and analyzing the dynamics of the environment sends a powerful message to students about

environmental ethics. The ethical questions underlying the ultimate responsibility for the environment, its quality, and its uses can be a lasting effect of learning through fieldwork.

7. Teamwork: Fieldwork most often relies upon being a member of a team destined to learn more about a problem or issue, and perhaps to develop a plan to resolve it. Community action groups, public policy groups, and neighborhood watchdog groups all rely on teamwork. Important experiences are carried from fieldwork to community activism on a range of topics from environmental aesthetics to sustaining water resources. Fieldwork experiences provide an important teamwork element.

In addition, the following aspects of fieldwork may be added by the authors of this paper to the work of Gold and colleagues.

8. Skills: A powerful set of skills and their application are developed and honed during fieldwork. Beyond the skill of observation are those of synthesizing information, evaluating information, and making reasoned decisions about the efficacy of information. There are also the instrumentation skills that once learned, become life long skills. These include using a compass and topographic map, field sketching and field mapping, using aerial photographs and hand held cameras to obtain a photographic record, and the skills of interviewing people in languages other than one's first language. These are skills developed largely through students' interaction with their environments in the world outside the classroom. Practical problem solving, adaptability to new demands that call upon creative solutions while doing fieldwork, and thinking on the move while making observations and collecting data are important skills are strong benefits of fieldwork.

9. Uses of Technology: Fieldwork provides the opportunity to apply technology to investigating problems and issues. Laptop computers with spread sheet software are easily transported to the field. Mapping software permits recording and mapping observations directly while in the field. Different types of probes for measuring temperature of water and air, chemical analyses of water, and soil moisture content may be connected directly to a computer and recorded using software. Global positioning systems (GPS) permit the recording of relatively precise locational information for observation or instrument stations. GPS information may be coordinated with topographic, soil survey, and ecology maps to study relationships within a fieldwork area. Collecting information using digital cameras and downloading to software on a field computer or laptop enables an analysis of the image and its elements for certain features. Remotely sensed images may be used for detail and for organizing information about the

area of the field study, both as hard copy and on a compact disk archive of images (Figure 3).

Figure 3. Geographic positioning system (GPS) enables more precise locations to be mapped during fieldwork. (Source: Teresa Mau-Crimmins)

The effectiveness of fieldwork as a strategy in which students learn equally or more than using a textbook or classroom experience is not well documented in the research. Conventional wisdom does suggest that hands-on, minds-on study outside the normal

classroom and in the natural or human landscape does have compelling benefits. Of the benefits that can be readily observed and recorded are those related to inquiry as a process for teaching and learning. In fieldwork, the students begin with the questions, or hypotheses, and then engage in a process of inquiry that leads them closer to answering the question or testing a hypothesis. The application and immersion within the inquiry model of learning may be the most obvious learning benefit from fieldwork. That immersion also brings other questions and problems to the forefront, and is a persuasive context for the synthesis of ideas and information. Fieldwork allows and requires the participants to view the world around them as a system of interwoven parts, like the texture of a fabric with its interlaced strands.

3.3 Philosophical Tensions Regarding Fieldwork

The perusal of the literature regarding fieldwork, its focus, and the way it should be carried out reveals two long standing tensions and one newly emerging tension. The tensions of longer standing are between scientific inquiry based fieldwork, emanating from the positivist approach within academic geography, and the humanistic approach that also has a prominent role in geography research and teaching. Slater (1982) summarizes the differences.

> *The scientific approach places a high value on the development of numeracy and analytical thinking skills, along with the ... data collection. The skills and understandings promoted in humanistic geography will be different in emphasis and foster the development of feelings and conscious introspection about people and places which require the exercise of oracy and literacy rather than numeracy* (p. 89).

While both approaches value the power of observation in the field, they reflect different outcomes from fieldwork. The scientific inquiry based fieldwork strives to solve problems and answer questions of geographic significance. The humanistic based fieldwork strives to develop a sensitivity to people and the environment, to establish empathy for people functioning within a particular environment, and to pursue active participation to address issues of social concern. The development of both philosophical approaches and their contributions to understanding and explanation in geography have been discussed and synthesized in recent research (Lai, 1999).

The third element of tension is much more recent, but has its foundations in earlier generations of fieldwork in geography. The interpretations of fieldwork and the "work" aspect of it has varied over the years. In some instances the teacher does the "work" and it is more like a lecture outside of class. Alternatively, the "work" has been mere copying or filling in of worksheets based on direct observation. In other instances the "work" has entailed actually getting one's hands and feet dirty making measurements

and collecting samples for later analysis in the laboratory. A new aspect of fieldwork has entered the scene. It is "virtual fieldwork" completed from the keyboard of a computer. The techniques applied by scientists to observe Mars are now applied to Earth and it is possible for students and researchers to observe the geographic elements of both nearby and distant places without ever setting foot out-of-doors in traditional "fieldwork." The tension results when the question is asked: Is virtual reality fieldwork acceptable as fieldwork?" One only has to review the points made earlier on the advantages of doing fieldwork (Gold, Jenkins et al., 1991) to provide a compelling response that the virtual does not do the same things as does actual work and learning in the field.

The authors believe that the jury is still out on the question of virtual reality fieldwork and it will take considerable evidence to conclude that it replaces the actual experience of being in the field adequately to be called fieldwork. The authors further believe that the tension between the scientific and humanistic outcomes of fieldwork is manageable. While some fieldwork is strictly physiographic measurement and reporting, and others will be perceptions of safe zones by residents of an urban area, there is much about the discipline of geography that makes it practical and essential to move along a continuum between the two. For example, fertilization of lakeside landscaping is usually detrimental to the water quality in the lake. The scientific process of runoff and contamination can be determined by slope, precipitation, soil porosity, and vegetation based on fieldwork. The value that residents place on landscape aesthetics, the tradeoffs they are willing to make for green grass versus lake water with naturally balanced aquatic growth, and the willingness-resistance to changing values are critical to the same problem. Therefore, while there is tension between the scientific and humanistic approaches to field work, the tension seems to rest largely in the types of questions, problems, and issues examined and not entirely in the hardness or softness of the information collected and analyzed.

3.4 Inquiry Centered Learning and Fieldwork

Students of school age are being prepared to be functional and responsible citizens of the larger society in which they live. Part of being a responsible citizen is being able to address problems and issues of public concern and make responsible personal and social choices regarding those problems and issues. Later in life, those same students become the policy and decision makers at local regional, and national levels. Therefore, the types of learning experiences through fieldwork should complement the inquiry process and the problem solving. Scientific inquiry is a powerful and important means to that end.

The use of field work to introduce and further the inquiry process has been cited in bibliographies (Ball, 1969; Lukehurst and Graves, 1972), local community study guides

(Committee on Local Geography of the High School Geography Project, 1971; Arnold and Foskett, 1979), and over a long period in teaching methods publications for teachers at both school and university (Fairgrieve, 1926; Graves, 1965; Gopsill, 1966; Everson, 1973; Glynn, 1989; Gold, Jenkins et al., 1991; Bland, Chambers et al., 1996). Fieldwork readily fits within the larger educational practice of inquiry in that it involves students learning actively and much of the field work involves higher order thinking. Higher order thinking entails classifying information collected in the field to answer a larger, more persistent problem. Learning does not cease with the collection of facts in fieldwork, but goes on to provide explanations, even though they may be tentative.

The approach used in fieldwork is consistent with the inquiry process described by Dowdy and Wearden (Dowdy and Wearden, 1983). They identified six stages of scientific inquiry that may be readily applied to fieldwork in geography: 1) stating the problem; 2) formulating the hypothesis; 3) designing the experiment or fieldwork; 4) making observations; 5) interpreting the data; and 6) proposing conclusions. While the scientific method is presented as a series of steps, it should not be viewed as a rigid formula. The intent is to enable students to become adept scientific investigators (Thomas, Corey et al., 1977). Bartlett and Cox (1982) applied the scientific inquiry process to field study and developed a schema for field based inquiry (Figure 4). The strength of the schema suggested in Figure 4 is that it results in two forms of field based analysis of spatial information. One is the enhanced knowledge and understanding of a particular problem or issue, while the other is the enhanced knowledge and explanation of a particular problem or issue leading to theory building or modeling with far greater reaching explanatory powers.

The importance of field based inquiry is supported by the research about the development of conceptual knowledge (Hinman, 1998). Hinman proposes that science learning is not easy for students because full development of both scientific content and reasoning requires "three essential elements: rigor, measure, and content." An important component of the research question about how students learn concepts of geography and other science is offered by constructivist theory (Rita, 1998). In short, constructivist theory proposes that a student brings along to each new learning situation a whole host of *a priori* beliefs and some of those, in the eyes of the students, are applied to newly introduced information and affect how it is interpreted by the student. It is here that fieldwork and constructivist theory in learning are directly related. An inquiry-based learning process, such as fieldwork, formalizes some of the new conceptual knowledge the student encounters, and part of that new information may conflict with the existing conceptual framework the student has developed for concepts based on prior experience.

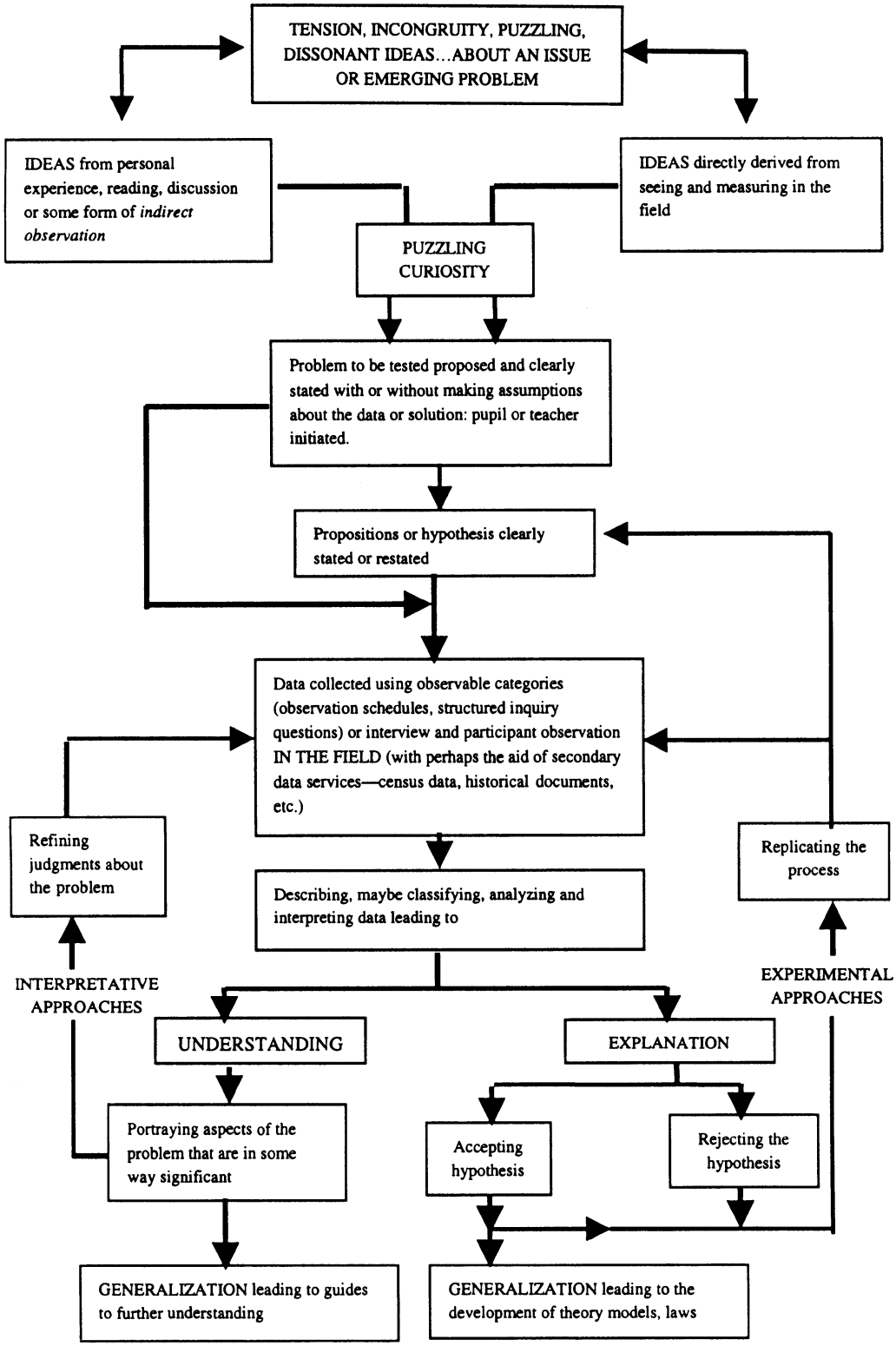

Figure 4: A Schema for Field Based Inquiry (Bartlett and Cox, 1982)

For example, a student may develop the concept that the rate of stream flow is dependent upon the volume of water in the stream bed. This concept could be the result of playing with a garden hose on the lawn, or observing flooded waterways on television programs. However, the information has been received and the concept is accepted by the student. In geography fieldwork, the student and other classmates are measuring stream flow. Two streams with approximately the same volume of flow have very different rates of flow. This observation is in direct contrast to the *a priori* belief that volume of flow is the major determinant for rate of flow. What could explain the incongruence between belief and observation? The fieldwork extends to include measurements of slope and gradient. A new concept incorporating gradient of stream bed and its effects on the rate of flow in the channel emerges and must replace the *a priori* belief that the student had conceptualized prior to arriving at the fieldwork. The earlier constructed concept and its associated relationships have to be replaced by the newly observed information and resulting concept of stream flow. The new concept of stream flow rate and volume is the essential foundation for examining bed load of a stream, erosion potential, and stream valley formation. The newly constructed conceptual knowledge is based largely upon fieldwork, its associated observations, information processing, and thoughtfulness regarding the analysis of the observed information. The newly constructed concept may be generalized to all stream flow and rate-of-flow-gradient problems and transferred to new situations.

The idea that students construct their own knowledge using information and concepts is widely observed in the literature of science education. Conventional wisdom suggests that fieldwork does exactly the same thing using direct experience and subsequent reflections as the source of the information. While the connection between constructivist theory of learning and fieldwork seems natural, there is no body of research literature that has emerged addressing the question. A major research study in 1999 examined the role of fieldwork as experiential learning (Lai, 1999), building on the theory that the experience of participation in fieldwork that gave students direct experiences in "doing" rather than "watching" made the learning more influential and durable. The study by Lai cited a greater level of environmental awareness and the transfer of a fieldwork perspective to other aspects of schooling, both attributable to fieldwork. The study was not specifically designed to test constructivist theory through fieldwork, but it does examine how students used experientially based information to mentally construct ideas about the environment.

Currently, there is no compelling set of research evidence that firmly suggests fieldwork is beneficial to learning. The role of personal experience in building and assessing constructive understanding has been perennially demonstrated by direct involvement in laboratory and fieldwork exercises, and those observations and anecdotal accounts are numerous (Foskett, 1999). As a result, conventional wisdom, tradition, and the positive benefits of socialization and experiential learning for students engaged in fieldwork are

incorporated adequately to build a rationale to justify fieldwork as part of a curriculum at all levels of schooling. The practitioner looks at the same issue of research in field work and concludes that we do much in education that is not supported by specific research evidence, that there is a strong tradition of fieldwork within geography. Therefore, it is judged to be beneficial and sound educational practice since students both learn and apply skills, have memorable experiences with the "real world" content of geography, and apply the overarching process of scientific inquiry to fieldwork.

3.5 Fieldwork Using Technology

Incorporating the splendors of geography and the classic fieldwork example that form the basis for geographic inquiry that are far from the school where students are studying has long been a dream of many geography teachers (Hilton, 1992). It is technology more than any other development that has brought fieldwork to the crossroads. Maps, photographs, aerial photography, and remote sensing are all technologies that provide the means to examine places in great detail without every setting foot on or near the location. While the sounds, smells, the press of the environment against the flesh and the panoramas that provide a holistic view are missed, it is possible to gather a great deal of information without going into the field. Granted much of the fieldwork once completed in geography is now completed using technological aids.

The belief by many geographers is that remote sensing technology is merely a good supplement to fieldwork. On the other hand, there are other aspects of a place that may be gathered using remote sensing that go beyond what fieldwork alone can provide. This distinction comes to the forefront when geographers use the terms "spectral class" and "information class." There have been major strides in rendering distinctions between various land cover and other surface characteristics using remotely sensed data. However, those data are often lacking in the way of human definitions of surface condition, the processes that humans are applying in using the surface of the Earth, and especially in the value that is placed by human occupants on the elements of the Earth's surface. The balance between fieldwork observation and representation of the phenomena observed using technological rendering of the information is the question. This relationship is of interest to geography teachers since it represents the way that technology and fieldwork interact. The tradition of fieldwork in geography arose because the world cannot be brought back into the geography laboratory (Haggett, 1990). However, much of what is in the field can be examined before hand using the products of the new technologies, thus permitting background analysis of areas prior to fieldwork to be much more thorough.

There are numerous aspects of the spatial relatedness between world conditions along with their processes and how they are represented using technology. Take for a moment fieldwork on the stratigraphy of a syncline using natural outcrops as reference points. Maps, aerial photographs, and remotely sensed images, along with geological cross sections of the syncline provide important pre-fieldwork information of the site. The scale of the site ranges from the entire geomorphic structure to the problem of identifying layers of similar sedimentary materials on both of the eroded slopes of the syncline. Fieldwork should be informed by this "abstraction level and scale dimension" discussion, since the discussion sets the parameters of expectations using remotely sensed data. Figure 5 represents the gradients along which technological means provide information to enhance fieldwork . Fieldwork by geography students should focus mainly within the elliptical dashed line on Figure 5 that the authors have inserted on the original diagram that demonstrated the abstracting-scaling dimensions of scientific observation (National Research Council, 1997). Geography does not work at the micro scale of sub-atomic particles, nor at the scale of the solar system and other galaxies. It does apply abstract images to highly abstract diagrams in research and fieldwork, but technology plays an increasingly significant role as one moves outward from the centroid of the sphere. The most sophisticated of this technology adds significantly to fieldwork since it is normally completed as preparation in the laboratory or classroom prior to the fieldwork, or when possible it is taken along in order to ground-truth and validate conditions observed.

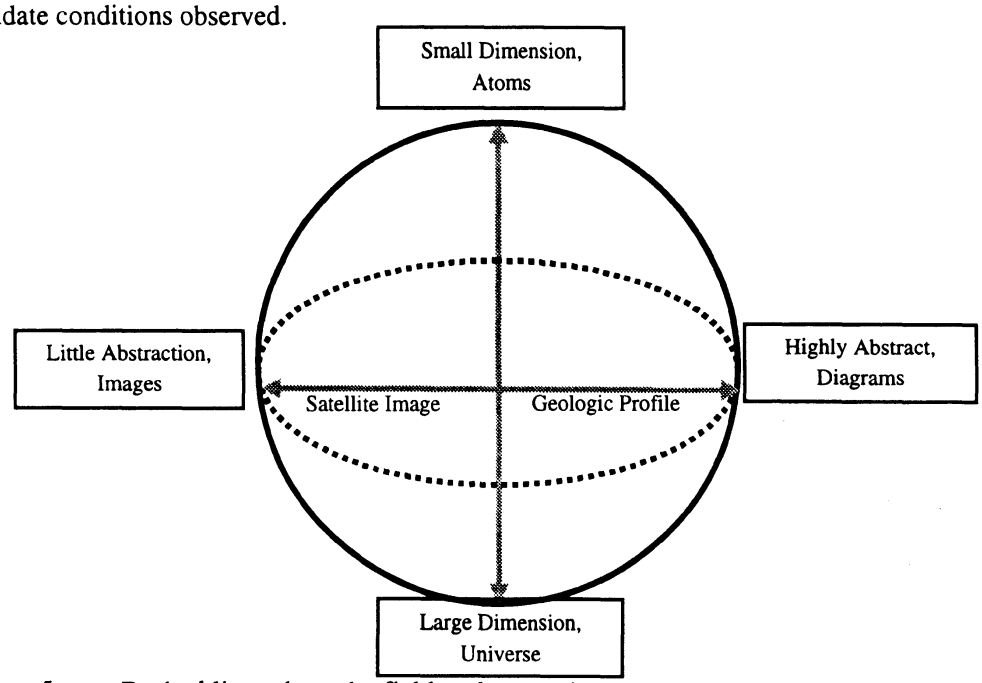

Figure 5. Dashed lines show the fieldwork range in geography along the gradients of observation and representation of scientific observations dimensions. Adapted from the National Research Council (National Research Council, 1997)

Technology also merges abstractness and scale through virtual reality software. Virtual fieldtrips are touted for their graphic design, an ability to generate high interest levels. However, the focus is on fieldwork for this paper, and while fieldtrips are an important part of instruction in geography in many places, there is a difference between them and field work. Usually the main difference is the absence of scientific inquiry in a fieldtrip, and while field trips and field courses sometimes require walking and collection samples, they are more passive or have major components that are more passively organized than is fieldwork (Nairin, Higgitt et al., 2000).

The use of virtual fieldtrips moves from what is a planned passive to active balance of the field course to the passive role of observer (Stanfield, Fisher et al., 2000). Newly developed virtual excursions demonstrate considerable creativity in applying scientific inquiry to such environmental problems as landfills and the long term storage of nuclear waste (Kelly, Ott et al., 2000). In both of these topics the problems of obtaining access and information on actual landfill and nuclear waste sites give credence to using virtual reality software. There are many instances where access is not possible, but which are inherently interesting to students, either passively or actively in approach, such as fieldtrips to regions of conflict. To make information accessible and add some of the adventure and discovery of field geography, computer based experiences such as the Bosnian virtual fieldtrip have been developed (Crampton, 1999). However, while such fieldtrips overcome the friction of distance electronically using virtual reality, a virtual land use excursion seems to the authors to have less educational value than land use fieldwork in the local area of the school of community.

Technology such as global positioning systems (GPS) and geographic information systems (GIS) permit greater specificity and accuracy of measurement, processing of data, and presentation of mapped information. The cost of this equipment is well within the budget of many schools. The software is often reconfigured and made less complex for students of various ages which enables them to become engaged using the software with little more preparation than knowing how to turn on the computer and operate the mouse. On the other hand, there are numerous fieldwork instruments that are low technology, but very valuable. The compass, measuring tapes, magnifying lenses, tree ring borers, water testing kits, sextants, tape recorders for interviews or verbal notes, camera, and thermometers are instruments that students can use to collect meaningful data and information while doing fieldwork. While they may not have the "high technology mystic" about them, they are fundamental to many inquiries made while in the field.

3.6 A Resurgence in Fieldwork?

Based on the authors' reviews of the literature, there have been no international surveys of the amount of fieldwork that has been completed for elementary, middle, secondary, and tertiary education students by country. Therefore, there is not a good baseline on which to judge what is occurring in fieldwork internationally. There have been several other indicators that suggest greater interest in fieldwork in geography in recent years and that do show promise of a resurgence. For example, there have been several papers published in the United States in recent years that build a rationale and provide specific examples of fieldwork in geography for a wide range of students, as indicated in the references presented by Bednarz (1999). Foskett (1999) edited a Forum on fieldwork that presented examples of and a rationale for fieldwork from the United States, The Netherlands, China, and the United Kingdom. While not entirely representative of the geography curriculum internationally, the papers do suggest that there is not only a basis for fieldwork that can readily be justified, but that there is also at least a subliminal commitment to fieldwork. However, a verbal commitment is not going to be adequate in order implement fieldwork and inquiry. It will take an actual commitment where fieldwork is incorporated with the course of study or curriculum and assessed as a significant part of what the student knows and is able to do in geography.

3.7 Summary and Conclusions

There appears to be a degree of resurgence and interest in fieldwork at all levels of education. This may be enhanced by the extent to which fieldwork applies technology to study, identify, and solve actual problems that face citizens in many parts of the world. Teachers and students engaged in fieldwork are generally positive about the experience, citing it as one of the most memorable of their schooling. There is also evidence that hands-on and minds-on experiences such as those provided by well designed fieldwork complement the construtivist theory of concept formulation and the discovery of knowledge by students. The research on fieldwork suggests it complements a number of "opportunity to learn" principles that have emerged from the psychological and educational research. These include affective, cognitive, and social skills learning that result in the fabric of the informed individual and responsible citizen.

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SECTION 3
INTERNATIONAL PERSPECTIVES

4. PARTICIPATION IN ENVIRONMENTAL PLANNING AS A CHALLENGE FOR FIELD TEACHING: A NORDIC VIEWPOINT

LEA HOUTSONEN

4.1 Introduction

The internalisation of an active attitude toward the environment is regarded as one of the main aims of environmental education, and with this in mind, a number of experiments have been arranged in the Nordic Countries in which school children of various ages have been involved in developing aspects of their own immediate environment. It has been characteristic of most of these experiments that many instances have had a voice in the development work and that the frame of reference has been based on learning by experience and an action research approach. The purpose of the latter has been to assess and promote the opportunities for children and young people to participate in developing the environment in which they live.

The points of departure for the developmental research connected with this participation in planning have been an environmental psychology outlook on the interaction between human subjects and their physico-social environment, a collaborative approach to planning, allowing note to be take of the meanings ascribed by children and young people to their environment and a view of environmental education that emphasises not only the accumulation of knowledge but also sensitivity towards the environment, the promotion of critical reflection, practice in problem solving and empowerment of the participants (Horelli *et al.*, 1998).

The Nordic Countries have strong traditions of progressive democracy at the national and local levels, which provide a firm basis for developing new opportunities for participation and influencing the course of events in public affairs, but interactive planning as such is still in its infancy. New forums for cooperation and discussion have emerged, more far-reaching participation in planning has become possible and current procedures for environmental impact evaluation have introduced public discussion into many fields that were earlier dominated by experts. People have begun to look on community planning as a process characterised by user involvement rather than the power of experts as used to be the case. The desire appears to be to replace planning directed at one clearly defined set of goals with a dialogue between numerous participant voices in which several paths are kept open, as one can never be entirely certain what the future will bring. Planning in our modern society is both transparent and also open and flexible on the time dimension rather than being sealed and final. Similarly it tends to be bound to a particular place and to local needs rather than being applicable universally. The improvement of citizens' abilities to influence decisions has been one of the aims of the work that has been put in to developing environmental legislation in the Nordic

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 55-77.

Countries, as there is a general desire to leave more room for the expression of public opinion and for it to be taken into account. Influencing one's environment nevertheless calls for a knowledge of the contributory factors and of the processes by which environmental decisions are taken (Kukkonen, 1995: 64-65; Geesteranus, 1996; Leskinen *et al.*, 1998, 6-15).

One essential question that has been raised in the Nordic Countries is that of what measures on the part of society at large are required in order to create favourable conditions for citizen's to feel that they control their own lives, exercise personal responsibility and pursue sustainable living and learning habits. Education, schooling and the provision of opportunities for participation can certainly create a suitable framework for understanding the significance of one's own actions and the motives lying behind them, and for this reason there is a desire to strengthen the common learning and development processes experienced by actors in society that enhance their ability to face up to changes in sustainable development. Knowledge of one's own environment, local interaction and the strengthening of expertise are looked on as essential elements that can be provided by schools and other educational institutions, but success in this requires extensive cooperation between experts in different fields, and particularly in that concerned with the environment. In this connection a necessity has been perceived for initiating research into the processes involved in teaching and learning sustainable development and devising means of evaluating the effect of environmental education and teaching.

Interactive planning is seen as an arena in which various actors can meet and influence each other and each others' ideas, choices and potentials for action. More efficient communication of information and improved standards of education have increased people's interest in exercising influence in matters that concern themselves and their environment. Participatory and interactive planning is a challenge for the work of developing geography teaching and environmental education. Work carried out in the field and participation in developing their own environment are ways of promoting in pupils the skills and capabilities which are essential for the purposes of environmental education, and at the same time of activating young people's hidden resources and the channels of influence needed to stimulate the transformation of built environments into living communities.

The frame of reference for this article is based on an acceptance of the necessity for interactive environmental planning and on notions of the environmental capabilities of children and the development of these by the methods of environmental education.

4.2 Children and young people as planners of their own living environment

4.2.1 THE CONCEPT OF PLANNING BY PARTICIPATION

Many theories of planning put forward in recent decades have considered the questions of breaking down the hierarchical structures in planning and allowing participation by various user groups. Criticism of the prevailing doctrines of progressive democracy and a rational planning ideology has led to the notion of *planning by participation.* This is a

devolved form of planning that is based on the functioning of small action groups and on continuous learning, which strives regionally, locally and individually to promote the influence of individuals over their own affairs. The desire is to involve citizens in planning processes and to activate them to produce ideas which will contribute to that planning. As a counterbalance to the centralised, "top down" tradition, planning by participation emphasises local "bottom up" development that sets out from the grass-roots level, in which residents have chances to influence the planning process directly. This trend has manifested itself in the Nordic Countries primarily in the form of greater activity on the part of district residents' associations within towns and cities and village committees in the countryside.

Planning by participation is by nature a matter of corporate activity and working together, planning that takes place jointly between the administrative authorities, the residents and other bodies with an interest in a particular area with the aim of developing the environment, improving living conditions and monitoring the outcome of the planning measures. The focus of attention is on the creation and conveying of information, as participation means that the residents are involved in the generation of the data required for the purposes of the planning. The hope is that the everyday knowledge of the those who live in the area can be combined with the specialised knowledge of the experts in such a way that the planning process can be looked on as an act of learning for both.

It has been observed that the expert-dominated planning system that functioned in the days of the industrial society is beginning to be outdated. It is too slow and rigid to respond to the rapid progress that is being made nowadays and to the needs of the various user groups. Aura *et al.* (1997) point to instances in Norway where women's groups, for instance, have succeeded in altering both the planning process and the objectives enshrined in the content of the planning. It is this diversity of viewpoints and interests that we refer to when speaking of the many voices that must be heard in the planning process, alluding to both differences in opinions and the potential for dialogue.

Planning by participation can be interpreted as grounded in a hermeneutic philosophy of science and the neo-humanist planning tradition, in which the ideology lying behind planning conforms to the transactive model. This underlines a human-centred approach and the importance of participation and of making provision for this to happen. Thus planning by participation is based on an emancipatory ideology in which the attitude towards planning itself is one that highlights the notion of the spatial community (Haarni, 1994). This frequently implies at the same time that action research is assumed to be a crucial means of studying planning by participation, as in the statement by Hillcoat (1996: 150-161) to the effect that "emancipatory action research offers geographical educators and researchers the means to bring about social change at the local level by involving the relevant people in the research process."

More efficient communication of information and improved standards of education have increased people's interest in exercising influence over matters that concern them, and planning by participation and the emphasis on local initiative in areal planning matters open up opportunities for creating a better environment in which to live. Thus new forms and methods by which citizens can exercise influence are being developed all the

time, e.g. forums, workshops on the future or residents' questionnaires, in order to activate those living in a certain area to participating in the work of developing their own environment.

4.2.2 PARTICIPATION AND CHILDREN'S ENVIRONMENTAL CAPACITIES

4.2.2.1 *Starting out from environmental sensitivity*

When it is a question of the formation of a sense of responsibility for the environment, sensitivity is regarded as an essential prerequisite. Research indicates that people who act in a responsible way toward the environment are particularly sensitive to it, possess environmentally friendly values and attitudes, are knowledgeable on environmental matters, trust in their own ability to influence such matters and are also committed to this cause (see Hungerford and Volk, 1990; Dibble, 1995; Wahlström, 1997). Sensitivity to the environment usually refers to an emotional relationship formed by the individual on the basis of experience and sensory perceptions, a relationship that characteristically has values, beliefs, attitudes and interpretations linked to it. Thus sensitivity is the set of affective properties through which the individual develops empathy with the environment. But it is also the ability to sense and observe the environment, and where it is a matter of observing changes in that environment, rational knowledge is also required. Following the notions of Hungerford and Volk (1990), Wahlström (1997: 27) illustrates the principal tasks of environmental education by means of the model presented here in Figure 1, in which it is assumed that progress in

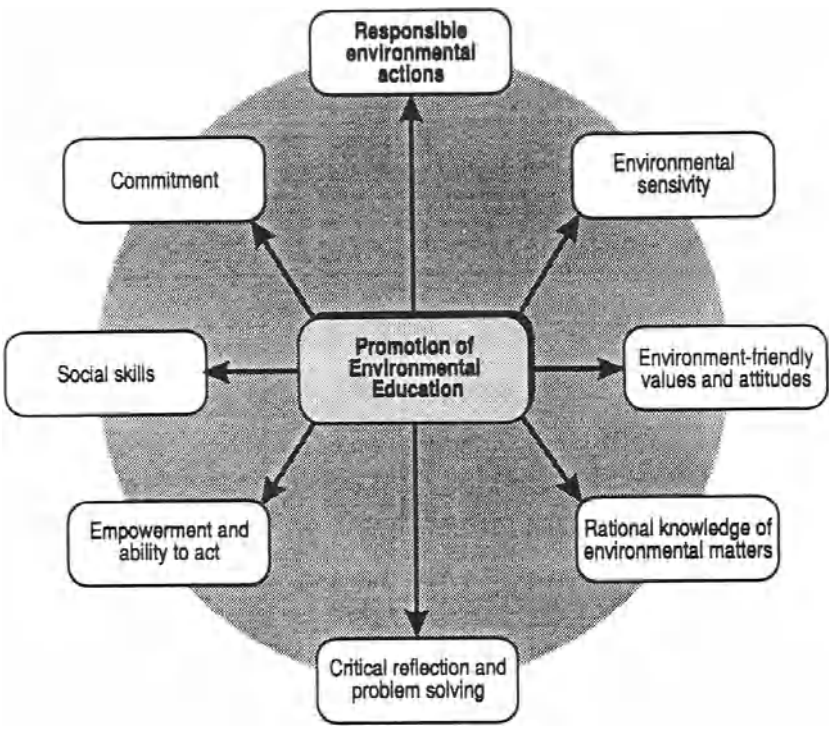

Figure 1. Principal target areas of environmental education (Wahlström, 1997:3).

matters of emotions, values and knowledge is required before the individual is ready for commitment or responsibility. Particularly important aspects are the development of critical thinking, deliberation and reflection.

One crucial aspect of environmental education is the integration of information, emotions and action. A comprehensive concept of learning emerges when emotional experience, thought and behaviour are in interaction with one another (Ojanen, 1995: 61).

Learning by experience is a way of educating people to be aware of the environment and willing to act accordingly in practice. Since people are active and commit themselves better to environmental values when the action concerned involves them personally, learning situations should be problem-centred and connected with pupils' own experiences, observations and thinking abilities. Attempts should be made to select topics that are of interest to the pupils and are associated with their personal needs, and to link the content to their everyday lives whenever possible (Houtsonen, 1997a: 163).

Thus environmental education is a combination of ethics, sensitivity, aesthetics, sociality and scientific knowledge, to which is also added information on the structures existing in society and their ways of working. At its best, it should involve students, teachers and community agencies in collaborative investigations of real issues in their local environments. The model for teaching and learning in environmental education put forward by Palmer (1998, 145) places emphasis on 'experience', 'concern' and 'action' as the elements that are of principal importance (Figure 2), for "without these components, no environmental learning can be truly meaningful and worthwhile."

In Finland, Houtsonen and Peltonen (1992, 1996) have studied the use of the various senses to appreciate urban environments, the subjects in these experiments being trainee teachers. As a result, they were found to achieve a capacity not only for examining the structure of an urban environment but also for analysing such an environment in a historical and architectural sense. One particular aim was that they should develop an ability to make sensitive observations on the way in which they experience an urban environment. The exercises provided were attempts at evaluating the quality of an urban environment and analysing what makes a good environment of this kind. When examining the structure and functioning of a city, the students observed that different values have to be considered in urban planning: aesthetic values, economic values, values connected with health and with traffic, and values imposed by the needs of everyday life and work. The exercises gave the students an opportunity to develop their own values and to advance their own experiences of observing an environment.

Built environments have also been examined from the perspective of how safe they are perceived to be (Houtsonen and Peltonen, 1996; Koskela, 1999). A feeling of security or of fear is part of the image that an environment arouses. Fear influences one's spatial behaviour and movement. The places most often regarded as frightening were parks and forests, for example, and also markets and open squares. Similarly, enclosed places were a source of fear, e.g. subways, narrow passages and alleys, also the parking lots of shopping centres and empty railway or metro carriages.

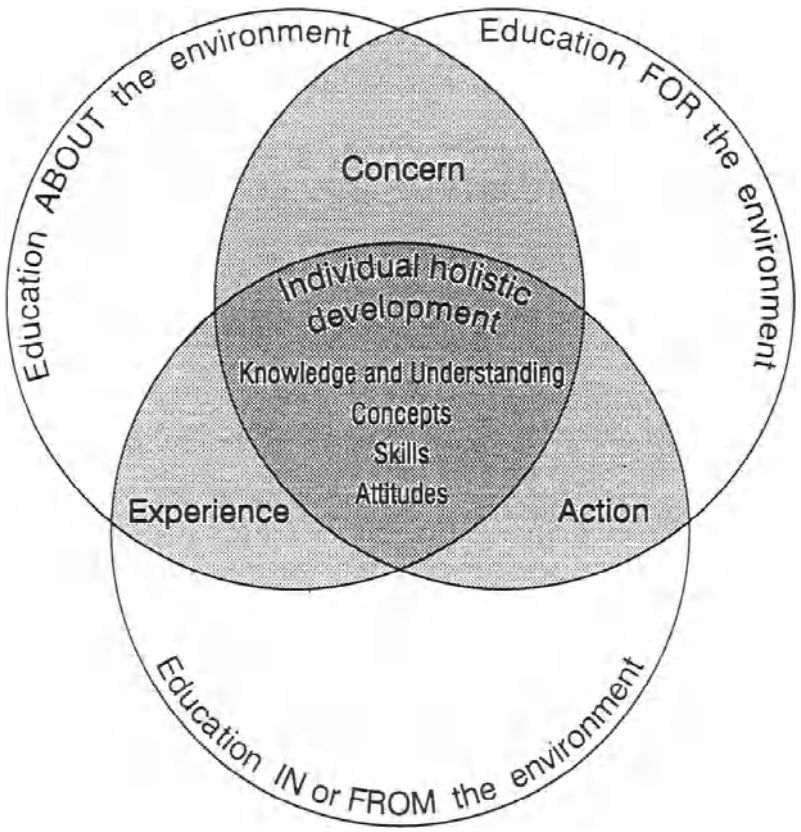

Figure 2. Model for teaching and learning in environmental education (Palmer, 1998: 145).

Houtsonen and Peltonen (1992, 1996) stress that an urban environment should be analysed as a historical and architectural entity in a school context as well, by considering the times when the buildings were constructed, the architecture of the town as a whole and the principles of urban planning. Efforts should also be made to promote a sensitive ability to develop an urban environment, to assess the emotional connotations aroused by each place, and whether a place strikes one as dignified, slummy, bleak, insecure or whatever. It should be possible to examine an environment as a soundscape or as a complex of smells and fragrances, to make observations in terms of touch to the skin, or to assess the overall atmosphere of a place.

4.2.2.2 *Young people's relationships with the environment*

The relation between a person and his or her physical and social environments has emerged as an increasingly significant object of research, the aim being to produce information for use in environmental planning that will promote the achievement of more human environments. Progressively greater interest is being shown in human-place interaction, accepting that every one of us lives in a relationship with some place or system of places, e.g. a hierarchy of home, housing area and town. Every place has its own physical features, activity content and usually a number of actors, and researchers have now become interested in various questions connected with places: How are people's

experiences of various places built up? What places do people feel to be their own, and what places is it difficult to take root in? How do the physical, functional, social and symbolic aspects of places support or confine the actions of individuals or groups? What opportunities do people have for influencing the nature of places and the things that occur in them? Similarly, one object of investigation that has gained in importance is the linking of places into support networks within neighbourhoods or parts of a town that can be of help in the organisation of activities for children, young people or the elderly. A person's relationship with the environment is a constantly developing process that needs to be worked on actively. And it is a two-way, transactive process, in which people alter their environment and the resulting, adapted environment provides them with new development opportunities (Horelli & Vepsä, 1995; Aura *et al.*, 1997).

A good environment in which to live is composed of a network of places which allow for significant activity and interaction on the part of inhabitants of all ages. This means that young people as well should be able to participate in shaping their living environment and to share in a social environment in relation to which they can act and construct identities and personalities of their own. It should be possible in the context of geography teaching in particular to examine the environment and problems connected with it at local, region and global levels. The model presented in Figure 3, which was used in Houtsonen (1996) to illustrate the environmental education viewpoint within geography, serves to emphasise that environmental education should be directed towards examination not only of the global environment but also of local environments, and that it covers both the natural environment and the built and social environments. The essential thing is that it should develop students' sensitivity to environmental matters and their knowledge of such matters, guide them towards responsible behaviour and provide the capabilities to exercise influence in questions concerning the environment.

The elimination mechanisms that operate in our globalising, post-industrial society are apt to arouse feelings of frustration and alienation in young people, and it is certainly the case that various alienation phenomena and instances of a loosening grip on the instruments of control in society have been characteristic of the last decade. As a result, many young people lack the enthusiasm, self-confidence and range of channels of influence that one would expect of an active citizen. On the other hand, there are certain processes of social change, most notably what has come to be referred to as glocalisation, which not only pose threats but also offer better opportunities for participation to new groups such as women, children and young people. The term *glocalisation* denotes the contradiction that arises from the trend towards globalisation of the economy and a decline in the influence of nation-states as against the new significance assigned to the local and regional levels. It is impossible for local administration or the traditional planning system to react to these challenges by invoking old-established methods (Heiliö, 1998: 47; Horelli *et al.*, 1998).

Our post-modern society demands of its members ever more versatile skills and flexibility. The expression *post-modern* as such alludes to a society characterised by uncertainty and contradiction and by the disappearance of the great self-evident truths, so that ethical questions are returned to the individual level. The tension between modern and post-modern is perceivable above all in the emergence of individual young voices.

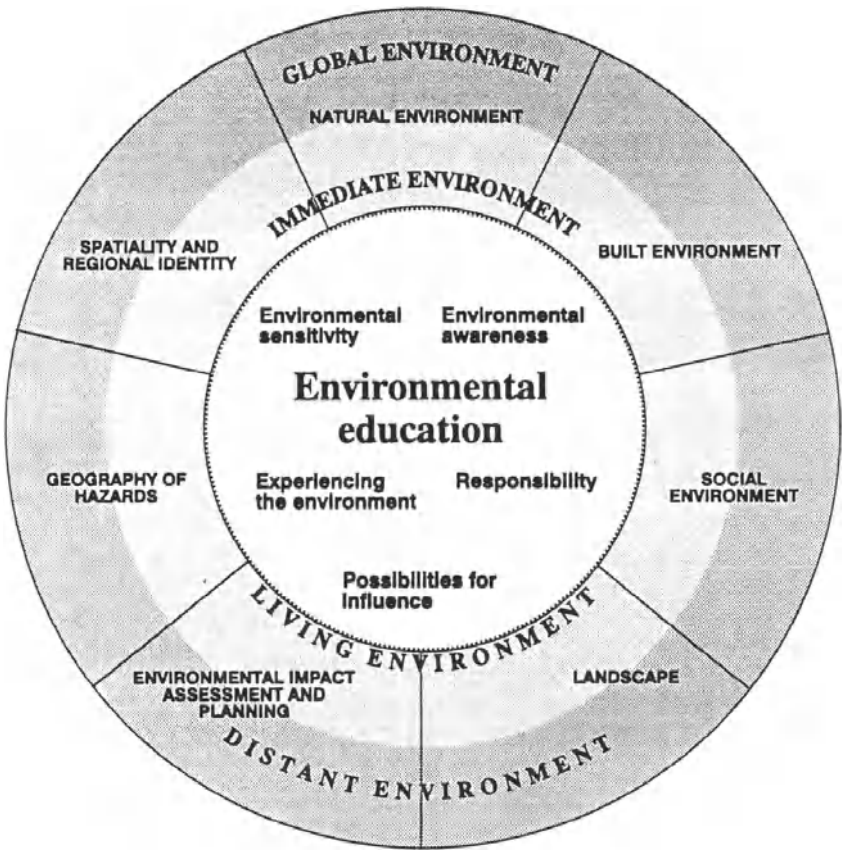

Figure 3. A geographical view of environmental education (Houtsonen, 1996: 70).

People's identities develop in constant interaction with their environment, so that individuals are both active participators in their culture and products of it. At the same time the reinforcement of young people's social affiliations and participation by means of various networks and project action groups is regarded in the Nordic Countries as offering opportunities for action for which school education can provide the necessary capabilities (Uusitalo, 1998: 39). Biilmann (1997) emphasises that environmental education is an important political issue, and maintains that it is for this reason that it has been an object of much lively discussion in Denmark in recent decades. He notes that it is a central aspect of traditional geographical education and calls for the introduction of strict scientific methods into Danish environmental education. One important research project in Finland from the geographical viewpoint has been that concerned with the living environments of junior school pupils (Rikkinen, 1992), one outcome of which has been the encouragement of a broad range of research.

Changes in concepts of learning, developments in teaching technology and the gradual changeover from mass teaching in schools to workshop, individual or team-based study in real-life situations are all trends that have called for the development of new field teaching techniques, means by which pupils can themselves examine the environment and the bearing of responsibility for it. Similarly, the principles of sustainable development require skills on the part of teachers for educating young people to be aware

of environmental questions, to have a knowledge of environmental values and to act as responsible citizens in defence of these values (Horelli *et al.*, 1998; Palmer, 1998). Teaching of the means of exercising influence in society also calls for a personal sense of responsibility. The important thing is to be happy in the feeling of being able to influence matters and to be conscious that one's own actions are of significance (Käpylä, 1994: 15).

The views of children and their possibilities for participation in the planning of the physical environment have been taken seriously in Norway, and a recent reform of the building law has obliged every local authority to appoint an official with the task of pressing for the rights of children and young people in connection with public planning decisions. Horelli *et al.* (1998) claim that this has given the children's viewpoint greater prominence, but the ways of acting in such situations and the means of participation are not yet fully resolved.

In Finland the Nuorten Suomi (Young People's Finland) 2001 project was carried through in the late 1990's with the aim of creating new, innovative practices for organising citizens' participation on their own initiative in the development of the environment in which they live, the services available to them or the social or cultural aspects of their community. The project has raised the question of the extent to which real, new opportunities can be found hiding behind the clichés of the information society. It has been asked, for instance, whether young people can really act in a pioneer role to assist in the spread of a genuine networking culture and the creation of models for influencing local affairs. One possibility would be an electronic young people's parliament, a project for a form of social debate, exchange of ideas for concrete action and the production of culture taking place via an inter-school data network. The Nuorten Suomi 2001 project also came up with the proposal that a series of courses should be included in the work done in schools in order to prepare young people for exercising influence in their immediate neighbourhood, for advancing their media skills, for project thinking and for developing organisational capabilities (Heiliö, 1998: 47-48).

The following five criteria were proposed in Houtsonen (1997a) as a point of departure for evaluating the success of environmental education in developing young people's capacities in this field:

(a) *Does environmental education develop an understanding of the topics to be studied?*
The education provided can be regarded as successful if the pupils have personally internalised the matters that have been discussed.

(b) *Is environmental education based on the pupil's own experiences and processing of these?*
Learning by experience is a way of educating people to be aware of the environment and willing to act accordingly in practice. The dynamic learning that arises in this way stems from the tension between earlier experience and new knowledge, so that learners' attitudes change and their cognitive structures develop. This also implies ethical considerations and the acceptance of responsibility for their actions.

(c) *Does environmental education involve knowledge, emotions and action?*
Environmental education should develop the pupils' ability and desire to act independently and responsibly in matters concerned with the natural environment, built environment or social environment. It is important that pupils should become capable of independent, responsible action on behalf of the environment and other people on their own initiative. Pupils need to be encouraged to express their feelings and should be given positive feedback.

(d) *Is environmental education implemented in cooperation and interaction with other sectors of the community?*
Environmental education should develop pupils not only as individuals but also as members of the community and its organisations, a task which places emphasis on cooperation and social values.

(e) *Does environmental education contain an element of enthusiasm?*
Shared experiences, workshops, meetings and other events can lend an air of reality, rhythm and prominence to the work. Various kinds of projects and themes, excursions, fieldwork opportunities and school camps are well suited to environmental education, as they provide situations for learning by experience and generate enthusiasm for the subject as a whole.

4.2.3 YOUNG PEOPLE AND THE MANY VOICES TO BE HEARD IN THE PLANNING PROCESS

The natural environment has been discussed a great deal in connection with environmental education in schools in the Nordic Countries, and in earlier decades it was understood primarily as applying to this form of environment. It is only in recent decades that increasing emphasis has begun to be placed on the built environment, as it is this that provides the surroundings for the pupils' everyday lives. At the same time environmental education as a whole has evolved into an activity than tends to concentrate more on ethical questions and the empowerment of participants.

MUVIN is an acronym for MiljöUnderVisning I Norden, a joint Nordic environmental education project aimed at developing cooperation between a number of school subjects touching upon such topics in the context of compulsory schooling, the upper secondary school and vocational schools (Houtsonen, 1997b). The general aim is that pupils should become aware of the conflicts of interests affecting the exploitation of natural resources. The more detailed aims contributing to this are (Jääskeläinen and Nykänen, 1994):

- sensitivity in recognising conflicts over exploitation of natural resources
- skills for analysing the values lying behind these conflicts and for identifying the individuals and groups subscribing to such values
- skills for developing ethically and aesthetically acceptable alternatives for resolving the conflicts
- skills and courage to take action with appropriate cooperation partners to further a solution that is regarded as desirable.

The MUVIN project thus draws attention to matters concerned with environmental education through the perception of conflicts in everyday life and underlines the importance of mastering the factors lying behind these conflicts in order to arrive at solutions. School classes are asked to discuss conflicting interests that arise in the human use of natural resources and to place particular emphasis on ethical and aesthetic questions. The project sets out from the recognition that environmental problems are fundamentally conflicts of values, and that good teaching should not gloss over these but should train pupils to acknowledge their existence, handle them and resolve them (Anttila-Muilu, 1996; Breiting, 1996).

The built environment is never neutral, but always reflects the values and objectives of its creators, usually adults in positions of power, and these values and objectives do not necessarily make any allowance for the process by which children and young people gradually extend the range and depth of the circles in which they live. It is typical of most housing areas that they are rarely designed with children in mind or in order to allow children and young people to participate in the production of information on their surroundings and in the shaping of their environment. A monotonous spatial, functional and experiential environment can make it more difficult for children to develop in a favourable manner. Horelli (1992: 5) nevertheless stresses that information exists on the demands placed on the environment by the various stages of development through which children pass, and thus their participation in the planning and construction of the reality that surrounds them is a great challenge for society.

It has been claimed that the guiding principle for planning an environment that is friendly for children is that it should form a support network, i.e. it should incorporate all the significant factors that help children and young people to manage in their daily lives (Horelli, 1992: 10). This network, as defined by children and young people themselves, should possess the following features:

- **ecological factors** (nature, clean air, absence of rubbish, animals)
- **physical factors** (low, spacious buildings, play areas and meeting places, traffic arrangements that consider children)
- **functional factors** (different activities, hobbies, sensible forms of participation)
- **psychosocial factors** (friends, adults who care about young people)
- **organisational factors** (cooperation between young people, adults, schools and officials)
- **experiential factors** (safety, a sense of community, beauty, ethical satisfaction).

According to Horelli (1994: 11), children and young people have a multidimensional concept of their environment and an ability to employ what they know about it to improve its quality. Rigid structures in their surroundings can impair their growth and development and prevent them from participating fully in society. This means that the elements of the supportive network cannot be transformed into opportunities for action which will carry their development forward. Creation of the necessary conditions for these supportive networks to function properly means that the physical structure of the

whole area must be looked upon as a progressively enlarging environment in which the daily functions of children, young people, the disabled and the elderly have to take place as smoothly as possible. Viewed in this way, the most important factors are usability, safety of movement, the service network and an environment that operates on a human scale. For this reason the developing of an environment that is suitable for children calls for the involvement of numerous instances - including the children and young people themselves - in a planning process in which many voices can make themselves heard.

The research methods employed in this sphere include both techniques that support pupil participation and traditional means of data acquisition, usually combined with qualitative methods of analysis and interpretation. The various participation methods adopted in the project meant that the pupils were able to develop a wide range of fieldwork skills.

The results indicate that the children and young people who took part in the experiments had learned to analyse the surroundings in which they lived in a well-informed manner and that they had acquired skills that increased their ability for critical reflection. Such results pose challenges for environmental education as it takes place in schools, as this teaching can evidently affect how pupils develop as critical evaluators of their environment and innovative generators of ideas who really want to influence their own surroundings. Williams (1997: 27) similarly puts forward a process-based model for fieldwork in which the students' awareness is a key entry point for challenging attitudes and assumptions and developing positive environmental participation.

4.3 Methodology of participation projects

4.3.1 EXPERIENTIAL LEARNING

Involvement in the 'shaping' of society and local culture has a favourable effect on the individual's relation to the environment, as this involvement is at the same time a learning process grounded in action and the experiences derived from this action. In the best case, planning by participation and dialogue can be a process of learning and development for all the parties concerned (Taylor, 1996; Aura *et al.*, 1997, 162). In the context of Nordic participation experiments the experiential learning model of Kolb (1984) has proved to be a useful means of describing participation and influence as a learning process. This theory, 'Kolb's circle', provides an analytical framework in which action, e.g. to solve problems in environmental planning, increases experience, deliberation and the ability to distinguish and conceptualise particular issues, and leads at the same time to more profound action. In the terms of the model, action and critical consideration of the experiences arising from it can increase both conceptual understanding and the level of the ever more complex activity (cf. Ballantyne and Uzzell, 1996). Horelli (1995: 129) seeks support for Kolb's model by combining the concepts developed by Engeström (1992) for the association of action with the surrounding society with an attempt to apply suitable methods and tools to the various stages of the circle (Figure 4).

4.3.2 METHODS OF DEVELOPMENT BY PARTICIPATION

Planning projects designed to promote pupil participation have been carried out at

various levels in the school system within the Nordic Countries. In most cases they have been in the nature of evaluative development studies, characteristically defining certain values as starting points and certain scenarios, applying theoretical viewpoints to the performing and interpretation of empirical descriptions, initiating action in accordance with mutually agreed objectives and assessing the results of the process (Horelli, 1994: 15). Assistance has been obtained from the theoretical models and concepts of developmental work research in order to bring about changes and evaluate the results, effects and development processes from the perspective of the various interested parties.

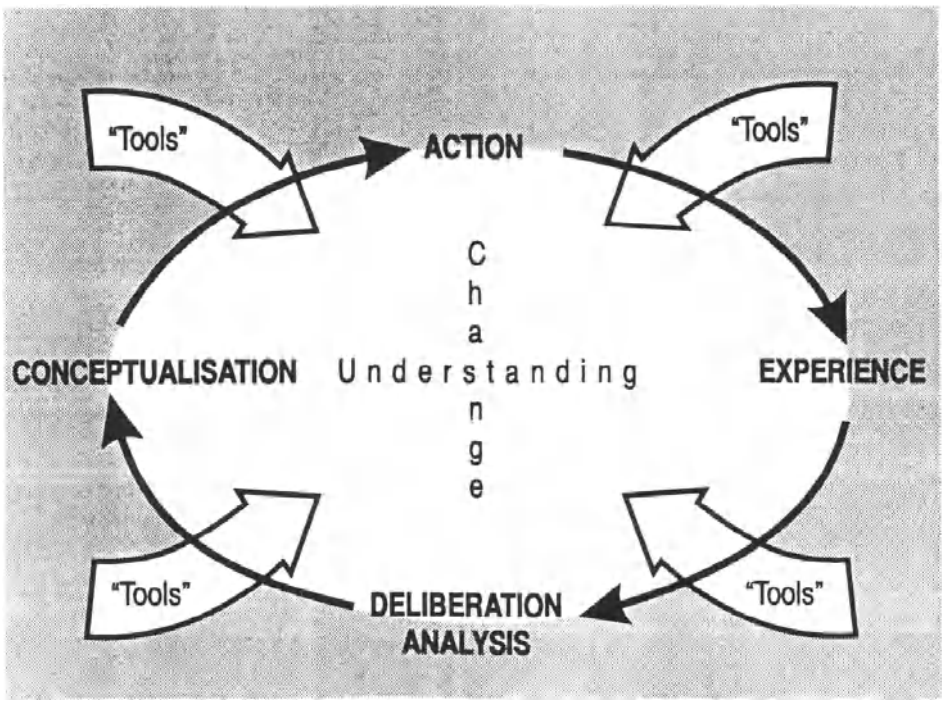

Figure 4. Circle of learning based on action and experience, which can be divided up by various appropriate methods. This scheme presented by Horelli (1995: 129) is based on the experiential learning model of Kolb (1984).

The methods employed have included both techniques aimed at supporting participation and traditional means of data acquisition and analysis. We will take a look now at the extensive package of environmental education material used in the project of Horelli, Kyttä and Kaaja (1998), which was adapted in cooperation with the teachers at the schools involved in the experiment for inclusion in the normal teaching. This package contained various techniques for encouraging participation, or developmental methods, applying to various stages in planning (Figure 5). The developmental stages recognised in the project were motivation, analysis, planning, implementation and evaluation, and a variety of techniques were on offer at each of these, the largest numbers at the motivation and analysis stages and the least at that of implementation.

The developmental methods employed included diagnostic, expressive, situational, conceptual, organisational and political ones, these being integrated into the stages of community planning as parts of the normal teaching at the school. The methods were most frequently of the diagnostic and expressive types, with organisational and political methods in the minority. The effects of the project on the young people were studied as it progressed and in retrospect, by means of interviews, questionnaires and essays. The developmental methods used by Horelli, Kyttä and Kaaja (1998) were the following:

4.3.2.1 Diagnostic methods
These served as analytical techniques for evaluating situations and environments, e.g. for evaluating the workshop on the future employed at the motivation stage or the surveys of environmental attitudes and mental maps used at the analysis stage.

4.3.2.2 Expressive methods
These include methods that elicited expressions of thoughts and feelings, e.g. the voting and essay writing approaches used at the motivation stage, the map stickers used at the analysis stage and the individual and group approaches to the planning stage.

4.3.2.3 Situational methods
These were techniques for producing and analysing situations, e.g. the walking tour at the motivation stage, or the environmental panel discussion and exhibition at the implementation stage.

4.3.2.4 Conceptual methods
These were techniques that helped the pupils to understand the models, concepts and ways of working, e.g. the project for evaluating young people's influence on the environment at the analysis stage or the self-evaluation at the evaluation stage.

4.3.2.5 Organisational methods
These supported implementation of the results of the process, e.g. the environmental panel discussion at the implementation stage or the exhibition at the evaluation stage.

4.3.2.6 Political methods
These were techniques for exercising influence in society, e.g. the environmental panel discussion at the implementation stage, or the negotiations with key persons and the exhibition at the evaluation stage.

4.4 Pupils as agents in the development of their living environment: Nordic case studies

4.4.1 AN ENVIRONMENTAL PARTICIPATION PROJECT CONDUCTED ON CHILDREN'S TERMS

Familiarisation with the environment in which one lives and the importance of participation by children in bringing about change were the topics of a research and development project carried out in the small town of Kitee in eastern Finland in 1992-1994 in which pupils aged 7-12 years were allowed to plan their own environment (Horelli, 1994; Aura *et al.*, 1997). The purpose of experimenting with a number of

methods was to initiate dialogue within and between the various participating groups, while the associated research element was aimed at supporting, monitoring and analysing the participation of the children and young people in the planning process, where participation was taken to mean involvement in the development of the environment to such an extent that there was room for growth in knowledge, emotional commitment and responsibility on the part of all the groups concerned.

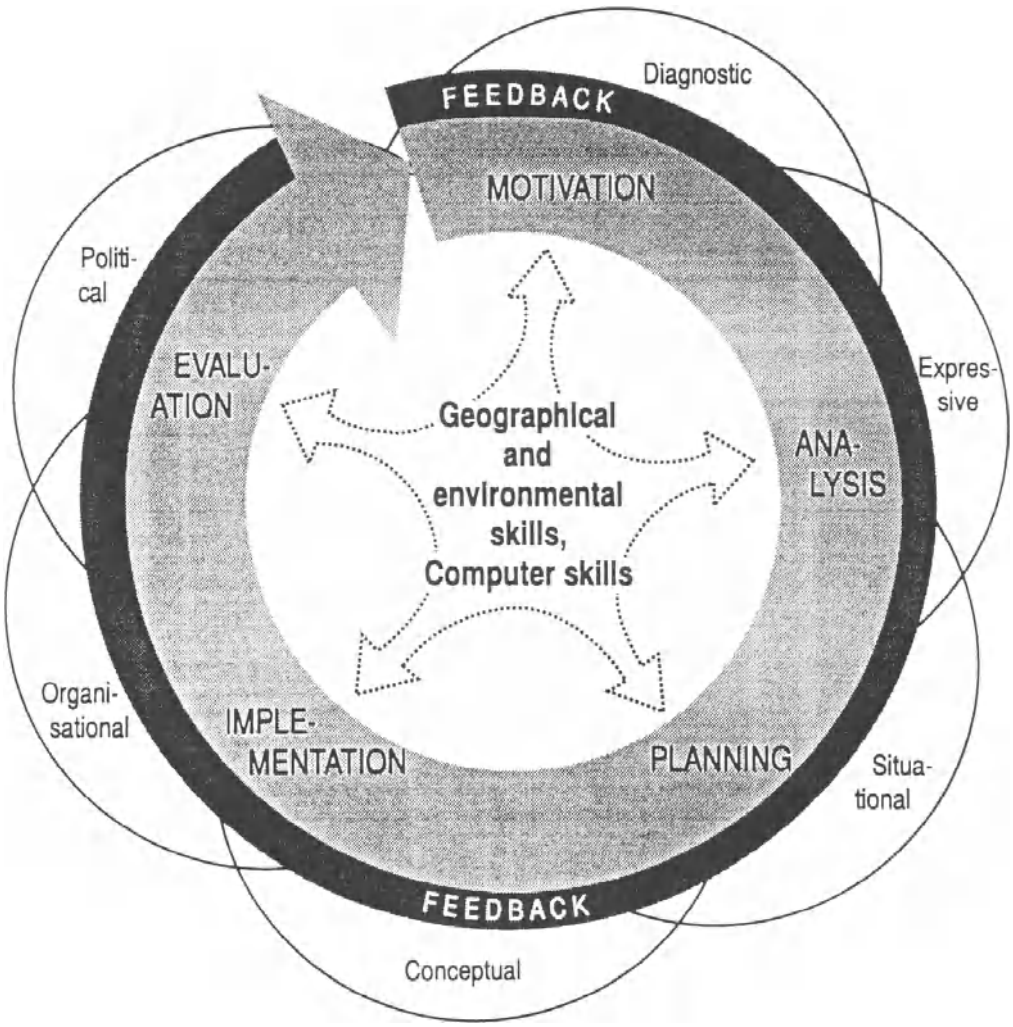

Figure 5. A schema for applying the experiential learning model to environmental education in the context of neighbourhood improvement as part of environmental education in Vaasa, Finland. The planning cycle is enhanced by the use of various enabling methods and by a self-assessment system. Diagram adapted from that of Horelli (1997: 111).

A variety of methods were employed in this project, including the following means of generating situations, acquiring data and communicating information (Horelli, 1994: 15):

- instructions and tools for planning by participation
- workshop for the future
- organisation of events
- participating observation
- interviews and questionnaires
- analysis of the children's environment
- analysis of documents
- evaluation of the project

The project was initiated among the Environment Club at the school, by developing a plan for the immediate surroundings of the school with the aid of a scale model. The project led in time to the formation of a Residents' Association in the area, to local and national exhibitions of the plans drawn up by the pupils and to implementation of some of the ideas generated.

The pupils' opinions regarding the planning of the environment in which they lived were concerned with conservation of the natural and built environment, the provision of play areas and places for various activities, protection of the yards of houses, improvement of play areas and yards, safe traffic arrangements, the utilisation of shore areas, good personal relationships and the importance of the role of children themselves in their own everyday environment. Children's knowledge is different from adults' knowledge, but the children proved to be excellent sources of ideas and inspired 'environment builders'. Their plans typically raised a great number of highly diverse questions and unconventional solutions and were on quite a different plane from the routine predilections of the professional planners. The traffic safety proposal submitted to the town council jointly by the pupils and the Residents' Association was a good demonstration of the equality that prevailed between these children and adults in planning matters, and also a good opportunity for the children to learn in practice how local government decisions are made.

The aim of the research aspect of the project was to support, monitor and describe the participation by the children and young people in the planning of their environment, extended environmental education and preventive social policy. The factor common to all of these things was regarded as being development work that required participation by various user and expert groups. The children's participation gave them a feeling of being involved in an activity that was important and of real, practical significance, and also a pattern of action for this involvement. Particularly their visit to the council chamber and their opportunity to put their own case to the council members gave them a good introduction to the world of local government. The Kitee Project certainly lowered the fences dividing ordinary members of society from those responsible for its decisions and taught them something about cooperation.

The plans developed by the schoolchildren contained large numbers of points concerned with nature and various structures which would allow all kinds of new activities to take place, particularly ones connected with intensive movement, games, more peaceful

undertakings and social interactions. The traffic safety plan, for instance, pointed to widespread adoption of the methods of environmental education, as the proposal made by the children to the town council was built around the following actions:

- observation, both individually and in small groups, of geographical features in the area and activity taking place in it, and evaluation of risk factors
- documentation of the findings by means of photographs, drawings, models and essays
- identification of danger spots for traffic, analysis of these and suggestions for solutions devised in small groups
- presentation of the proposed solutions to the whole class
- practice in performing and communicating in public
- cooperation with the Residents' Association
- appearance at a Town Council meeting
- appearance in a panel discussion at the Museum of Architecture in Helsinki
- answering questions from the press, radio and television regarding their own exhibition
- writing the script for a video film of the project for an exhibition of local history

The planning work done by the children thus taught them how to make observations on their environment and document and evaluate these, to design and construct a model, to solve problems and to express these solutions by various means. Their participation and activity in this work taught them to see the immediate surroundings of the school, the area where they live and the ways in which local government bodies work in a quite different light, and at the same time they gained in cognitive and social skills such as communication, appearing in public, collaboration with others and the acceptance of personal responsibility. But above all the planning development work carried out in Kitee showed that 7-12-year-old schoolchildren are capable of evaluating the environment in which they live and thinking up new, creative solutions to the problems afflicting it.

The Kitee Project demonstrated that a school can function not only as a diversified learning environment but also as a real focus of development for its surroundings. Children's notions of community planning emerged in the light of the research as manifesting a broad-based ability to care for practical matters that affect the place where they live and the patterns of their daily lives. The recent revision of the land use and building legislation in Finland and the greater opportunities for private citizens to influence decisions in these fields that are provided in the new laws acted as a stimulus for this project, but most of all, the experience showed what a great challenge for the development of teaching in schools is presented by the task of ensuring that the children and young people of today grow into active and responsible citizens at the local government level.

4.4.2 CHILDREN AND YOUNG PEOPLE AS ECOAGENTS FOR THEIR ENVIRONMENT

Research into participation has shown that children are critical evaluators of their environment and innovative sources of ideas, but that their participation is frequently restricted to a single occasion. One of the aims of the work of Horelli, Kyttä and Kaaja

(1998) was to improve children's and young people's opportunities for participating in the development of the environment in which they lived. Their fieldwork took place at Ristinummi, a suburb of Vaasa in western Finland, and involved a total of 348 primary and secondary school pupils aged 7 - 14 years. Methodologically, this represented evaluative development research employing the techniques for supporting participation mentioned above together with traditional means of data acquisition and analysis.

The focus of attention at the organisational stage was on participation by the young people in development of the area and the generation of new practices in the school and in local government, the tools employed for this being planning and mobilisation meetings, a workshop on the future and walkabouts. The outcome was an agreement with the school and its teachers regarding participation in the project. The focus at the analysis and planning stages was then on the pupils' concrete analyses of the area and the production of their plans, the tools being project meetings, with the Deputy Mayor with responsibility for public works as chairman of the steering group, a package of environmental education materials, exhibitions and panel discussions. The outcome was an areal plan constructed by the pupils and an exhibition. The third stage was devoted to implementing the plans and the establishing of new forms of contact between the school and the city authorities, through the medium of meetings of the steering group, negotiations, summer jobs for the young people and monitoring of the project.

The outcomes were development of one small area within the suburb partly in accordance with the young people's plans, the status of an ecoagent as the core of the school's Agenda 21 programme, the emergence of new projects covering the whole area of the suburb and an educational programme for environmental entrepreneurs. The goal at the fourth stage was to make improvements to the yards of three primary schools and to develop cooperation between the schools. This was done through the medium of the environmental education package and exhibitions, and the product was a plan for an adventure trail joining three parts of the school yard that was based on the children's designs. The fifth stage entailed implementation of the plans for the school yard and the further development of cooperation, the means employed in which were meetings of the steering group, negotiations and dialogue between the children and the authorities. The result was a plan for improving the school yard and implementing the adventure trail, which was then carried out jointly by the council's public works department, a group of long-term unemployed young people and the teachers, pupils and parents of the three schools, working on a voluntary basis.

The techniques which were found to promote development best at the primary school level were the walking tour, map stickers, ecological analysis and the planning work carried out in groups, while at the secondary level the workshop on the future, map stickers and general planning by the whole class together succeeded best, alongside the planning groups. The main methodological deficiencies were connected with implementation and evaluation. Implementation of the plans calls for situational, organisational and political methods, and these were the ones that were used to the least extent. The exhibitions and panel discussions were good ways of paving the way for the necessary decisions before implementation could begin, but they were somewhat inefficient as far as the final outcome was concerned. The self-evaluation system used among the children and young people similarly failed in the researchers' opinion to

promote the children's self-awareness and lead to changes in behaviour. All in all, the methods that gave the best results were those that emphasised improvements in knowledge and critical reflection and those which allowed the children to acquire information on which to base their evaluations and planning. One consequence of the project was that the content of the environmental education that was given was widened from the teaching of cognitive subject matter towards the teaching of relations between processes, people and the environment, mastery over space and situations and collaborative working.

The individual planning work was followed by computer-assisted planning, employing the Archi-CAD program to produce designs both for the whole area and for separate new buildings and the Photo-shop program to adjust the façades of the buildings. The ideas lying behind this computer-assisted planning included the introduction of more colour into the surroundings and the replacement of some of the apartment blocks with waterways, vegetation and hills.

The research phase of the project consisted of an assessment of the process by which the pupils participated in analysis and planning of their environment and in the implementation and evaluation of their plans. As one example of the results of this research, we consider below the community planning stage carried out among the young people at the secondary school level (Horelli *et al.*, 1998: 29-30). The foundation for this planning had been laid by the techniques adopted at the motivation and analysis stages for acquiring the information and capacities necessary to support the planning process.

The planning began with individual designs drawn by the young people themselves. The distribution of all the elements planned is shown in the diagram in Figure 6. As individuals, both the boys and the girls concentrated mainly on designs connected with the built environment, the boys slightly more often than the girls, the difference being statistically almost significant. The girls paid more attention to preserving the physical environment than did the boys, and were more ready to consider repairing buildings and changing their colour and to propose the replacement of apartment blocks with individual houses. They also submitted many more designs connected with the natural environment than did the boys, the difference in this case being statistically highly significant. The girls were also anxious to improve the social environment, while the boys laid more emphasis on aspects of the built environment that supported greater functionality.

The impact of the project in terms of environmental education was assessed primarily by measuring the pupils' ecological attitudes before and after participation and comparing the results for the 'agent group' with those for a reference group. The answers obtained to the questionnaires led the researchers to conclude that the project did have a positive effect on the pupils' ecological outlooks, but it was not possible to deduce the nature of this effect any more precisely.

The impact of the project on the pupils' environmental knowledge was studied by means of mental maps, again assessing the situation beforehand and afterwards. The content of the conceptual maps representing the actual environment altered in the course of the project to the extent that the proportion of concepts associated with the built

environment decreased slightly and those of the natural and service environments and the environment of doing and influencing increased. Likewise the percentage contribution of criteria connected with the environment of doing and influencing to the description of the ideal environment increased and that of concepts concerned with the natural environment declined. The researchers claim that there was evidence of increased knowledge about the environment and increased critical reflection on environmental problems as a result of the project.

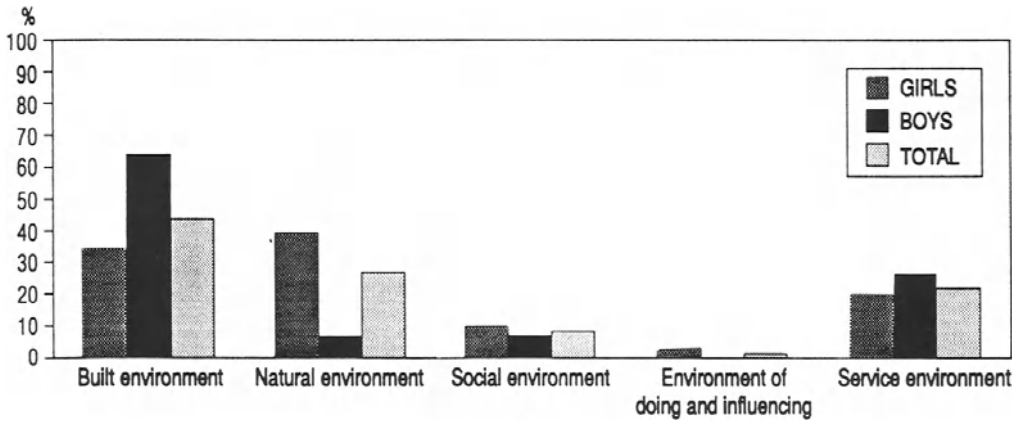

Figure 6. Content of the individual designs put forward by the boys and girls. Percentage distribution of the elements designed by content (Horelli et al., 1998: 29).

Horelli, Kyttä and Kaaja (1998: 50-54) stress that the performance of the children and young people at the planning stage in particular indicated that they were able to resolve the problems and conflicts that arose in the course of the planning no matter whether they were working alone, in groups or all together. They analysed the environment in which they lived in a well-informed manner and put forward ideas connected with nature, the aesthetic qualities of built environments, safety, freedom from pollution, services and a spacious community structure. By contrast, they were able to exercise very little influence on the implementation of plans, as they lacked adequate channels for approaching those responsible for the decisions.

The effects of the project and of the environmental education as a whole on the pupils were found to have been significant. They had above all learned cognitive skills and skills of a kind that would increase critical reflection, their discrimination ability with respect to their own living environment had improved and their views of their own environmental role had become more favourable and more active. The higher one goes on the scale of educational objectives (Figure 1), the more difficult it is to demonstrate that the project and the environmental education provided in it had any specific impact. As one potential measure of empowerment, the young people involved were asked after the project about their plans for the future, in order to examine whether their plans differed from those of a reference group, e.g. by containing more themes associated with the environment. The results suggested that they did refer very much more often to ideas connected with the quality of the living environment than did the reference group.

The methodological package employed in this project did fulfil its function of stimulating participation on the part of the pupils. It was also noticeable that the children tended to favour small-scale features and spaciousness in their plans, in the belief that residential communities should have a wide variety of joyful activities going on, places where young people can meet and pursue their hobbies and opportunities for influencing the course of community affairs.

4.5 Conclusions

Viewed from the perspective of environmental education, the participation projects reviewed here had the effect of teaching the children to look in a new way at the area where they live, the role of residents' associations and the organisational mechanisms by which plans are conceived and decisions made at the local level. Although it would be unrealistic to expect that young people's environmental plans could be implemented as such, the researchers involved in the development projects emphasise that the inevitability of having to make compromises should not be allowed to detract from their motivation for participating in these matters (Horelli *et al.*,1998: 50). The skills of defending one's own ideas and persistently carrying one's proposals forward are essentials for any citizen, however active, who wishes to exercise an influence on affairs in our democratic system. An active role for children and young people in matters connected with the environment can probably best be secured by means of concrete projects connected with their immediate environment, as was done here. Environmental competence is a complex of attitudinal sensitivity, emotional and cognitive skills and above all responsible individual and collective action under significant conditions in everyday life.

The transition from participation experiments conducted with children to more extensive participation practices is looked on in the Nordic context as a particular challenge for both teaching in schools and new areal planning procedures that are designed to provide opportunities for citizens' participation. New action networks will have to be created at the local level which are capable of responding to problems, including those perceived by young people, and it will continue to be possible to extend projects taking place in schools to concern development of the local living environment. These Nordic projects provide support for the notion that the schools of the new millennium will be typically outward-looking in their orientation, so that they will become real agents for change and develop into activating elements in the community (cf. Uzzell *et al.*, 1995). Participation in improving their immediate environment can bring children and young people forward as active citizens and exercisers of influence in the community.

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5. THE IRREPLACEABLE EXPERIENCE OF FIELDWORK

JOSEFINA OSTUNI

5.1 Introduction

The terrain as a laboratory *par excellence* is one of the most repeatedly used statements in any publication about the methodology of geographical research. This concept is already anticipating the significance of field work in the training of professionals and teachers alike. However, this statement, when applied in practice, paradoxically contrasts with the little theoretical development aimed at this issue. The abundant bibliography devoted to the graphic expression, in particular cartography, seems to indicate that the deep conviction about the benefits of field work among geographers is so internally rooted that it has been considered unnecessary to analyze its application in a teaching-learning situation.

The bibliographical search on the theory underlying field work as a procedure was no easy task. Very few books include some pages about it, and almost none contains a single chapter on the topic. Consequently, the exploration for sources was carried out in the area of scientific and social research, in which the work based on real facts is given special recognition.

By confrontation of all the bibliographical material, it was intended to set the criterion for a definition of the term "field work" and the different modalities that are used. At the same time, common guidelines were searched for the procedure. For this purpose, it was decided to have as a parameter what in the teaching field are considered to be the learning elements in a procedure. Out of this consideration, a model scheme was prepared in order to undertake the analysis of some teaching practices in field work, obtained from a general questionnaire sent to faculty members at various Geography Departments in Latin America and in Argentina in particular. Even though there was no massive response, the feedback was enough to understand and evaluate the state of the art, since certain constant elements appear which allow for generalizations with a high degree of certainty.

The potential of this procedure in the teaching environment makes it necessary to apply it at the different levels of teaching, especially at college level. In the educational reform policies, the procedure is included in the teaching contents, but without any appreciation for its application. The recognition of its positive effect on stimulation and consolidation of students' attitudes and values is fundamental to motivate the development of the necessary effort to overcome the multiple barriers which create an obstacle for its coming into effect. It is convenient to emphasize the value of field work in the global context of the teaching/learning process.

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 79-98.

5.2 Field work: its meaning

The bibliographical search evidenced not only the problem of the limited availability of bibliography but also certain profusion of terms, both of which made the understanding of the topic somewhat complicated. The translation into Spanish of French and English bibliography in part accounts for the diversity of terminology: excursions, field observation or work on the terrain, itineraries, etc. The ordering of the searched bibliography was necessary to throw some light upon some of these inaccuracies.
In the bibliography consulted, the following observations were made:

- *regarding the denomination used:*
  70% of the bibliography uses the term "observation or work on the terrain" or simply "work on the field".

- *regarding the different modalities:*
  only 30% make some mention of them.

- *regarding the steps of execution:*
  a scarce 25% list them, and there is no evidence of total coincidence among the authors.

In general it is observed that before the 80's there was a tendency to highlight the ***observation*** function in the task of the geographer and in the training of students in geography. And even though there are exceptions when indicating the steps for work on the field, most of the authors limit themselves to present activities applied to different situations.

After the 80's, the bibliography presents a more rigorous treatment of the topic. The rigor is shown both in the handling of terms and in the concern for considering field work as a procedure.

This change is evident in the teaching profession in these southern latitudes as a consequence of the influence of the cognitive-constructivist learning theory, adopted in the Educational Reform in Spain (1990), and widely spread in Latin America through the bibliography in the Spanish language.

The analysis of the bibliography points out a greater concern by the Anglo-Saxon authors for the theoretical treatment of the topic. This aspect is pointed out by a French geographer who, when referring to observation, states the following:

> *Out of a specific observation method can thus arise a problem, a theoretical reflection, and a proposal for an explanation. In truth, many geographers follow this course in a spontaneous intuitive manner, and without knowing it they are performing scientific geography. Such is the case of the French geographers in general, whereas some foreign ones, in particular the Anglo-Saxon, are more concerned with this type of reflection.* (Beaujeu Garnier, J., 1971:37)

Most authors, while using terms such as trip, or work, are making reference to field work, even though some of them make distinctions representing modalities which depend on the degree of participation of the students and on the function the instructor may perform, as can be seen in Table 1. The example of the Tupungato Valley (see Figure 1) approached from the different

modalities of outing into the field, will permit an illustration of its differences in the way of execution and in the results of the teaching-learning process.

Table 1. Modalities of field teaching

Characteristics	Common or defining criterion	Discrimination of activity by		Ex.
		Teacher	Student	
Field trip	Observation of terrain to obtain information	Informs or teaches aspects of itinerary	Takes notes passively	N° 1
Field work		Organizes and directs work	Participates actively in recording and communicates Results.	N° 2
Field investigation		Counsels upon request from students	Designs and performs all activities	N° 3

EXAMPLE N° 1 - FIELD TRIP

The teacher, or team of teachers, has outlined an itinerary following their objectives, with selected stops. The students carry their notebooks, and have been warned that there will be long walks to do.

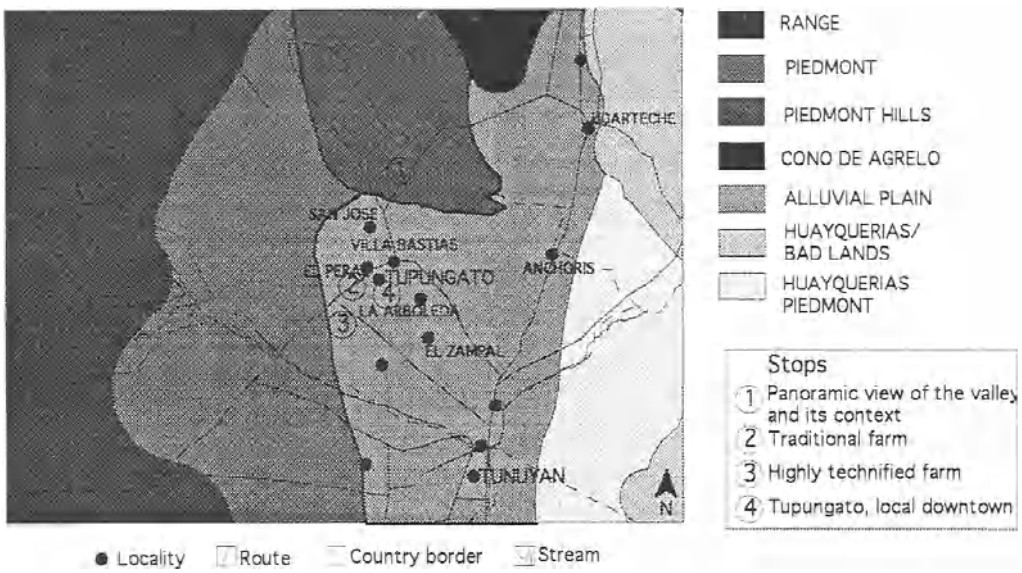

Figure 1. Map over the Tupungato Valley, showing the areas of the selected examples.

At the first stop, the students are requested to climb a small elevated point. Gathered up there, like in a kind of watchtower, they are shown the valley with all the structural or geomorphological units that it features. So as to complete their information, students are given the hydrographic and climatic characteristics of the various geomorphological units, as well as data about the most representative economic activities in each one of them.

The trip goes on, and the second stop is in a valley, where visits to two farms have been prepared: one of them uses traditional methods and the other one uses advanced technology. The persons managing these land properties shall provide information as to how to run them, land use, labor, production and marketing problems, main natural risks that have to be faced, etc.

Next, a time and place for a rest is proposed. This time for relaxing, for enjoying the natural landscape, for the analysis of the notes taken, will predispose teachers and students alike for a lively and fruitful discussion, used by teachers to clarify some points which may not have been well understood by the students.

After taking care not to leave any litter lying around, in protection of the environment, the last programmed stage is undertaken.

The group shall walk along the main street of the locality serving the area, and then stop at the main square or park, around which are situated the main buildings that give life to the locality: administration, health, security, education, religion. In this square the teachers shall talk about the different stages of settlement that the valley and the foothills have gone through, from colonial times up to the present time. Information is provided about the features of the downtown area that is being visited, its origins and its standing in the local urban network.

In this example, teachers are giving explanations all the time, and students taking down notes about as much information as possible, with some brief interventions to ask for some clarification. The information provided, sometimes overwhelming, is not always associated with that which can be directly seen or perceived. The advantage of this activity over classroom activity is that reality itself is providing the framework for the presentations and explanations, thus making them easier to comprehend. In addition, communication between teachers and students becomes more fluent.

At the end of the trip, teachers and students feel satisfied: a trip to the field is a pleasant activity for the students, and for the teachers, even though it demands a greater effort and preparation, it is also a satisfying activity due to the response they find in their students.

EXAMPLE N° 2 - FIELD WORK

In order to appreciate the differences, the same stops as for the field trip shall be maintained.

Prior to departure, the team of teachers who planned the outing shall explain the objectives and shall mention the conceptual and procedural contents to be applied. By way of a diagnostic evaluation, the students are brainstormed about their previous knowledge of the contents, thus being predisposed for the task. Students are organized in groups and they are provided with guides for the work to be performed on the field. The instructions in the guides are explained and clarified prior to departure. A briefing about the itinerary and the area is given. The place where

the groups shall split is determined, the time is allotted for the assignment, and the final meeting place is equally established. At this place, comments, reflections and conclusions about the work shall be made in common by all group members.

The first stop, as in the previous example, shall be at the watchtower point. The assignment shall be to work on a topographic map in order to identify the different geomorphological units, recording additional and supplementary information about observable aspects that are not indicated in the map. Also, a draft sketch shall be made identifying the different elements, describing their features, establishing comparisons and relationships about what is strictly observable.

Once in the valley, the same farms as in the previous case shall be visited, having been already visualized from the elevated point. On these rural properties, the groups or teams shall have to use the questionnaires included in the guides, but the possibility is given to students to add any questions they deem convenient. These interviews are extremely important since the students come into contact with the protagonists of the life of the area. They are also helpful to reflect upon the notion of scale, by comparing the panoramic view taken from the elevated point with what is perceived along the valley itself.

Later, in the town, the meeting places are determined, and the groups are assigned the different sectors in which they have to undertake their work with the questionnaire. The questionnaire in the guide is designed to collect the following information:

- the perception the inhabitants have of their own town, or locality, whether positive or negative;
- the environmental risks they consider to be most serious, and decisions made about them.

The teachers and instructors split accompanying the different groups so as to support and orientate their work in case they need it, performing some control action as well.

Once this activity is finished, and after a short rest, each team presents their results, the difficulties encountered, aspects for which more time is needed in order to have better results or to analyze more deeply.

In order for this not to be a mechanical type of work, the students are motivated to reflect on the work just done, what they got out of it, their flaws or mistakes and why, their best achievements and the reasons for them.

The task shall be completed at home, by making a supplemented report with the consolidation in writing and graphic form of all the information obtained, for the best expression of the results.

In this example, the students were the protagonists; the teachers simply controlled and guided the work. The students verify what they already know and what they have obtained as new and enriching elements. They exercise a series of mental operations: comparison of common and diverse aspects, comprehension of why a concept is an abstraction, etc.

The work on the field is performed in an agreeable atmosphere, as in the previous case, but in this case the students feel satisfaction for the job done. And although facing some difficulties at

times, they do not feel discouraged but rather more motivated to insist on a certain procedure so that their skills are improved for better and more reliable work in the future.

The personal contact and individual participation when working with the questionnaires develop a critical and responsible attitude in view of the problems of the territory under study.

EXAMPLE N° 3 - FIELD INVESTIGATION

This is the type of research performed by students as their final graduation work. In this case, the objectives, conceptual and procedural contents, techniques, and design of the research scheme are the responsibility of the student, though under supervision by the seminar tutor or lecturer.

At this stage, the students are expected to have undertaken and experienced a number of field work instances, and that they are in possession of a wide range of techniques both for gathering and processing information and for communicating the results.

The students have a double motivation: to solve or to find an explanation for the problem that initiated the research, and to obtain their graduation. In addition, the students expect their final work to reflect as best as possible the level of professional preparation they have achieved. All along their undergraduate career the students have understood that, even though direct observation on the field is an invaluable source, other sources such as topographic charts, aerial photography, satellite images, statistical data, etc., cannot be ignored. The students conclude, then, that both direct and indirect observation is the cornerstone of the geographer's work.

5.3 Field Work: teaching a procedure

When including the topic of field work in the teaching/learning process, it is proper to deal with it as a procedure.

The teaching of any discipline comprises the knowledge of something, the knowledge of how to do something, and the will to do something. In other words, it includes the learning of conceptual contents, of procedures, and of values and attitudes.

These three components are always present in any educational process, though in some instances one has predominance over the others.

Even though work on the field constitutes a procedure and implies the knowledge of how to do something, it cannot be undertaken, however, without resorting to concepts and without setting in motion attitudes without incorporating other procedures. Work on the field is a complex task that involves a series of activities belonging both to the cognitive and to the psychomotor domain. Such activities are sometimes so well integrated among themselves that it is difficult to ascertain when they belong to one or the other domain.

The specialists in didactics hold that the learning of a procedure belongs in the orbit of application, whereas the learning of a concept is an experience of acquisition.

> *The procedure is an application of general action methods that follow a pre-established order with regards to a common objective.* (Castañeda Yañez, C., 1985 :55).

The learning of work on the field, as any other procedure, involves a series of elements that must be clarified so that students may acquire the skill to put it into practice when conditions are given for its implementation. Successive applications will result in greater reliability and in satisfaction produced by the autonomy of knowing how to do something.

Students and teachers undertake intensive work: the former with the execution of the different steps, and the latter with their preparation and orientation of work.

Based on the bibliography, a detailed analysis has been carried out of the different steps proposed for the implementation of this type of work. Using those contributions and the teaching guidelines for the learning of a procedure, a scheme has been elaborated in which the elements of learning have been included (see Figure 2).

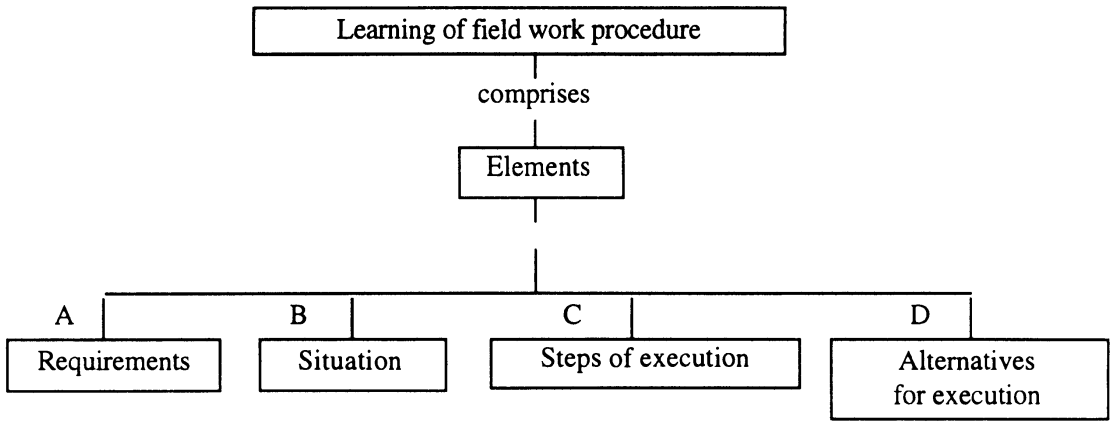

Figure 2 Scheme of Learning of Field Work Procedure.

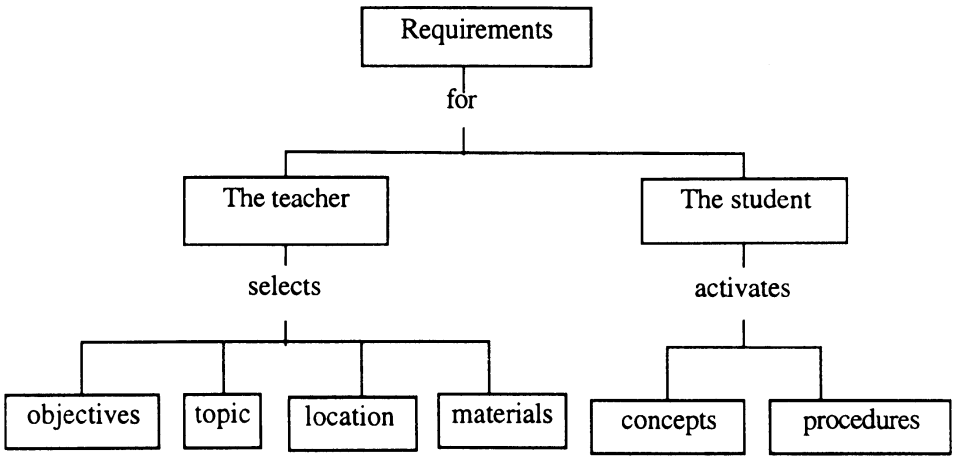

Figure 2.A. Requirements.

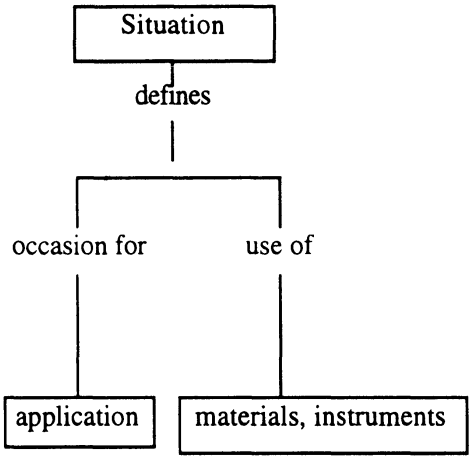

Figure 2.B. Situation.

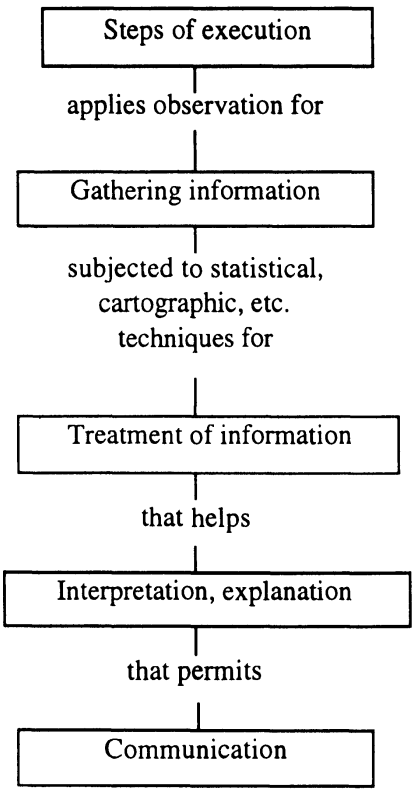

Figure 2.C. Steps of execution.

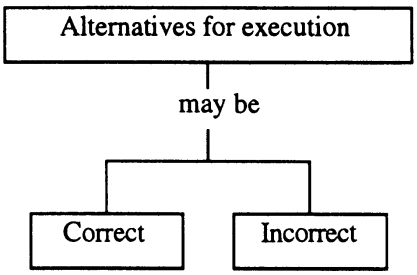

Figure 2.D. Steps of execution.

The activities of teachers and students in relation to those elements are presented in the form of a table see Table 2).

Table 2 Activities corresponding to the elements of learning of a procedure

Elements of Learning	Purpose	Activities	
		Teacher	Student
REQUIREMENT	Preparatory conditions	Sets objectives, topic, and location. Performs diagnostic evaluation about the contents to be used.	Activates prior knowledge. Predisposes intentionality and receptivity for the new task.
SITUATION AND MATERIALS	Circumstances in which the procedure is applicable. Materials and instruments necessary for execution.	Lists circumstances for implementation. - Field work is performed when observation and information gathering are required. - Presentation of a hypothesis or a subject may act as a signal. Prepares materials. Most frequently used materials: topographic maps, aerial photography, satellite images. Instruments: compass, GIS, thermometer, clinometer.	Gives examples and non-examples of situations for application: Example: Perception and behavior of rural population facing climatic phenomena. Non-example: Information about climatic phenomena that have affected the vineyard.
SEQUENCES	Different steps in the execution of procedure: Phase 1: Collecting observation, questionnaires, interviews. Phase 2: Treatment of information. Phase 3: Interpretation, explanation. Phase 4: Communication	Suggests various techniques for use at different phases. Controls execution of steps.	Performs activities corresponding to the different steps. Controls coherence of different steps. Communicates results: Verbal/graphic language.
REFLECTION	Acquire meaningful knowledge about procedure.	Evaluates achievements. Perceives most frequent errors by students: - Recording what is non-observable. - Gathering superficial information. - Not adapting information detail to the chosen scale or resolution level.	Makes a note of errors made. Restructures the net of contents acquired with the incorporation of new ones, or with modification of associations.

Since the procedure incorporates a variety of techniques, it is convenient that they be introduced gradually, so that the highest level of complexity occurs in the final courses, when students have already acquired a wide range of techniques. It is likewise important to warn that, given the complexity of the procedure, it is advisable that work on the field should be the result of the convergence of several academic courses which will not only make this type of work richer but will also give it more strength and soundness. The horizontal and vertical integration of the academic courses in the planning of any type of field work should be a condition widely accepted by the community in a Geography Department. It is convenient that the students should reflect constantly upon the activities they perform on the field, so that learning is not mechanical but really meaningful.

5.3.1 OBSERVATION: A PERMANENT PRACTICE

For a long time, field work was associated with observation, or observation was considered to be its main component. While it is true that observation is important in all scientific investigation, it is not enough in itself. Field work involves other activities as well. The sequence of field work has been presented in the form of a schema, in which the results of observation have been matched with other stages of activities (see Figure 3).

In all the bibliography on methodology, special emphasis is given to observation; therefore, it is advisable to make some special provision for its consideration.

If it is acknowledged that by definition observation is the result of observing, and to observe is to look or examine attentively, to scrutinize carefully, then it is evident that not any act of looking is observation. To observe is more than the mere act of looking we exercise in our daily lives. The act of observing is an important operation in scientific work, and its correct practice is what insures progress in any type of investigation.

Two definitions show us the essential function of observation:

> *Observation understood in a broad sense encompasses all the procedures used in the social sciences not only in order to examine the sources where facts and data under study are found but also in order to obtain them and record them so that they can enable us to know reality. Observation provides the researcher the raw material with which to work, which in turn will later be the subject of final treatment, through classification, tabulation, analysis, and explanation.* (Sierra Bravo, R., 1985 :196)

And also:

> *It is a process that requires voluntary attention and intelligence, guided by an objective that is terminal, organizing, and directed towards an object in order to obtain information.* (De Ketele, J.,1984 :21 quoted by Pérez Serrano, G. 1994 :23)

Both definitions give a total view of observation: on the one hand its function, that is, what it supplies us with, and on the other hand the attitude of the observer.

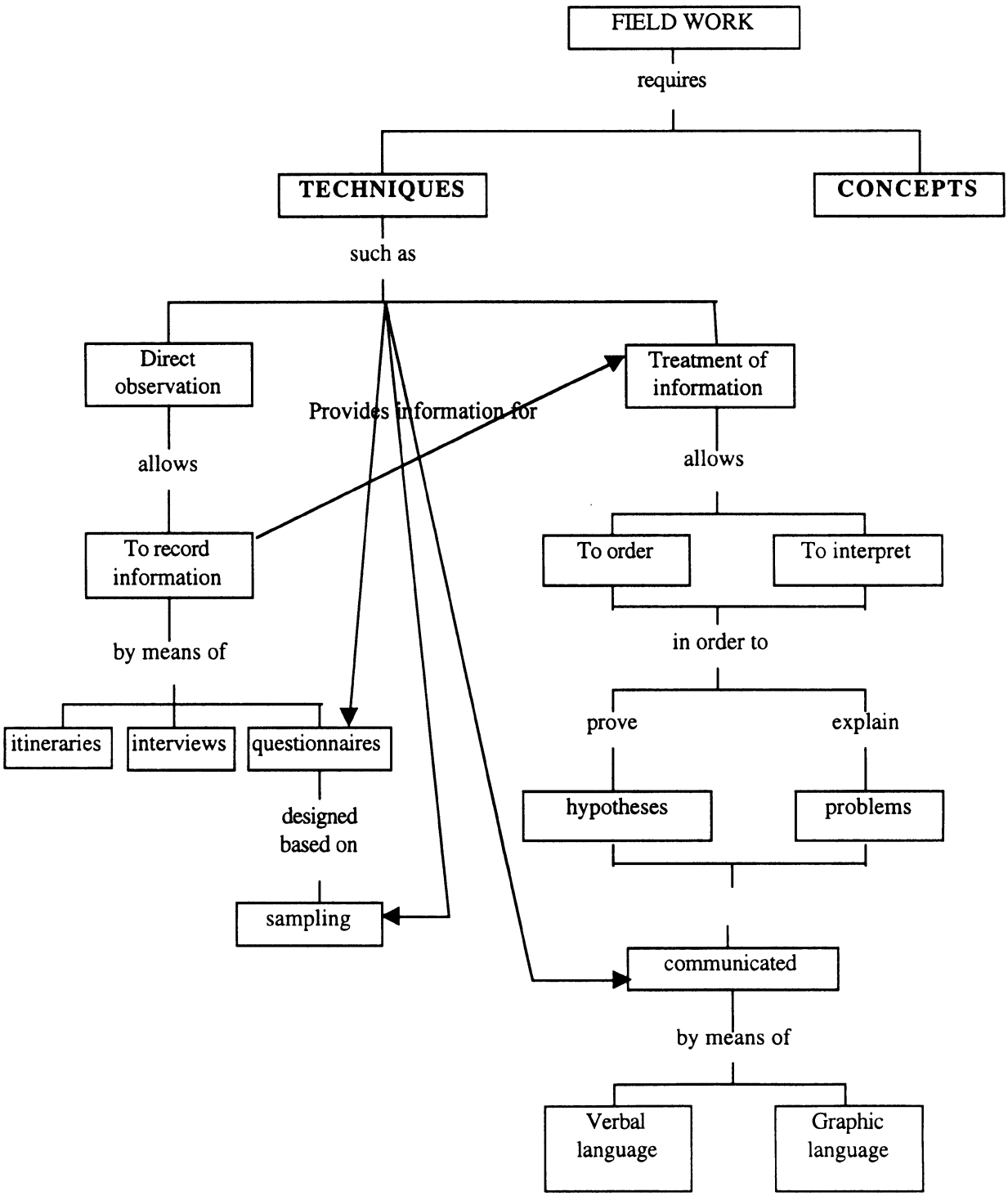

Figure 3. Schema of Field Work as an integrating procedure of various techniques and concepts.

It is convenient to keep in mind that observation is the result of two components, the observer and the object observed, and it can only be understood within the encircling totality of both terms. Observation defines a relational situation, since in order for it to occur, the presence of both terms is required, and it can only be understood in the analysis of both.

A good observation work demands certain conditions such as setting the objectives, the topic, the area on which observation is to be carried out, etc. In this way, the intentionality, receptivity and memory are all activated in the observer.

Intentionality is what makes observation not to be dispersed, but rather to be oriented towards definite aspects. Receptivity is achieved with an activation of the cognitive structure of the observer, which makes possible the identification of the objects of reality that shall be analyzed.

Memory enables the incorporation of new information and its availability for future observations. At an early stage, all these conditions constitute the requisites for field work, and it is necessary to meet all and every one of them so that the work on the field is properly performed and the expected results provided for in the planning are fully obtained.

If we consider the proposal of the social sciences about the observer's position in relation to the observed object, then we can say that in Geography, in most of the cases, such position is not participative, is not committed with the object, since the subject is situated outside the object. However, in the areas of perception, behavior, and social problems, even though it is situations that are observed, it is difficult not to have a participative internal attitude.

In order for investigation to be a powerful instrument, it must be rigorous, accurate, and comparable; these features shall be dependent on the way the object is approached. Observation not only bases itself upon the senses but it also resorts, as much as possible, to special instruments which pinpoint and widen the scope of the senses. It must be borne in mind that numbering not only provides accuracy but in addition it allows for operations that make the analysis deeper. Numerical description of objects or phenomena poses two preliminary concepts: the criteria or features to be analyzed, and the measuring scales or levels to be used.

The result of observation becomes materialized in the form of description. Only through description can the result of observation be made known objectively, stating the purpose by which it is undertaken and the conceptual framework that sustains it.

In teaching, it must be especially remembered that the capacity for observation of the student is the result of permanent exercise. In this way, "guided and graduated, the student gradually acquires the habit of observation which s/he has not received in perfect form from nature." (Titone, R., 1968:492)

Hence, it is worth noting an author's statement: "The high art consists in teaching the students how to use their eyes and to draw their own conclusions." (Wooldridge, S., 1960 :3 quoted by Board, C., 1970 :190)

5.3.2 STEPS FOR EXECUTION

In the proposed scheme, it can be noted that in the steps of implementation, observation constitutes an important step, because it provides information, which is the raw material. But

that function performed by it shall be completed by other moments in the field work, which above all belong to the assignments or activities the students perform after the work itself has been completed. The need to avail oneself of all the information possible, which at times calls for observation exercises, this time in an indirect way because it is performed on documentation, implies important work undertaken by students prior to execution of the step of treatment of information.

The ***treatment of information*** shall have different levels of complexity, according to the levels of knowledge of the procedural contents the students have. Nevertheless, whatever techniques are applied, the purpose of such techniques aims at reducing information, ordering and classifying it, establishing relationships between elements, and at setting the spatial relationships between the different variables analyzed. The higher or lower degree of sophistication of these techniques shall depend on the grade levels of the students.

Ordering and classifying would not be enough if they are not followed by interpretation. ***Interpretation*** looks for the relationship between the observed facts and the theoretical context. That is why the different interpretations given about the same phenomenon are a consequence of the theory adopted as framework. Interpretation facilitates the explanation of reality. Explanation is a basic step in intellectual work. Through it the conditions in which the phenomena take place are understood. Different modalities may be applied: to investigate the causes, the elements, and the relationships that structure the phenomenon, the function of the elements that make it up, the system into which it is inserted. Since it is no easy task, its mastery will be acquired gradually.

According to one author, "it is necessary to have some depth and some base of knowledge to be able to question the reasons, to demand for an explanation. This knowledge can be the result of field work or classroom work, but whichever of these instances shall be the result of prior systematic observation and description." (Randle, P.,1987:50).

One important facet of field work is the ***communication*** of the results through a well-structured and organized report, following the guidelines previously established. With regard to this type of activity, there are specific courses in which the different techniques for oral and written expression are taught.

For Geography work, a special place is provided for graphic communication. The graphic chart as a logical way of communication must transmit and show the results obtained. It must be a clear, accurate, evocative chart; one to see (Bertin,J., 1977:147), on which the different situations that have been observed are given spatial shape.

One important moment in the learning through field work is the final reflection that aims at achieving the ***meaning*** of what has been acquired.

With the joint participation of the different groups, students shall present their difficulties and accomplishments, and their comments about previous knowledge that had to be corrected or further specified. Students shall be instructed that in field work, only information that can be seen must be collected, not the kind of information acquired via some other means and not directly observable. Very often, students comment that a field outing enabled them to prove and rectify the idea they had about a certain concept. Opinions shall be exchanged as to the

convenience of starting out from hypotheses or rather to formulate the problems after observation in the area has been completed.

Most of the authors dealing with the issue of field work are coincident in that this type of work demands from the teachers a good knowledge of the area selected for study and careful planning, as for any other teaching unit. A proper exploitation of the teachers' high potentials in the training of geographers is necessary, avoiding the tendency to superficiality that is frequent when the teaching/learning medium is not the traditional classroom.

5.4 Attitudinal aspects

The teaching/learning process of field work is not be restricted to conceptual and procedural contents; it does also incorporate those of values and attitudes. In relation to the latter, educational institutions must take them into due consideration, in view of the crisis or weakening of various social institutions.

Field work is a learning exercise ideal for integration of the different kinds of contents. The special atmosphere created during its execution fosters -more than any other teaching/learning situation- the strengthening or the creation of certain attitudes.

Spontaneous and enthusiastic participation is generated by the de-compression of the teacher-student relationship created by work in the open air, and excellent results are obtained, sometimes going far beyond expectations. Students value this kind of activity because they are aware of the benefits it contributes to their formation, so much so that when consulted through questionnaires about a certain study program or course, their most frequent answer or suggestion is "the need to incorporate more field trips, since on the field they perceive everything with more clarity", adding that "learning and retention of contents improves considerably".

Field work develops values and attitudes related to the conceptual and procedural contents, because students show their interest to know more, to go on searching; it is as if the contact with reality encouraged them to go deeper into the different topics. In field work, communication and exchange among the different groups are made easier, something that rarely happens in the classroom. This situation fosters -and sometimes corrects- moral values and attitudes associated with personal behavior. The students express themselves as more confident in their actions, and in the expression of their judgments and the defense of their positions, maintaining their respect for arguments that are different from their own. Mutual support generates a cooperative and collaborative attitude, putting it into practice within a framework of solidarity necessary to overcome selfish individualism.

All this contributes to a more fluent relationship among students themselves and between students and teachers; hence the convenience of including field trips in the planning of a year's course in order to make classroom work easier.

Contact with reality allows students to discover problems, to deepen their critical thinking and judgment, to develop their respect for the environment and for the management of resources, to develop their sense of responsibility when facing the problems derived from the observation of a certain territory. Thus, one of the social goals of education is achieved: civic formation.

Certain values and attitudes are acquired and consolidated through field work in different courses, whether it be through their individual contents or through cross-participation among them. Field work is a suitable procedure that should be more intensively incorporated at the different levels of education, and in particular at college level.

5.5 The situation in Latin America and particularly in Argentina

Field trips were always considered of fundamental importance in Latin American countries, especially due to the influence exercised by many foreign and local scientists in the realization of many exploration enterprises. Later on, many scientific entities played a relevant role in this respect.

In Argentina, merit goes to the efforts of the Argentine Society of Geographic Studies GAEA. Through its Geographic Weeks, it promotes the knowledge of the country by including in its activities field trips or pedagogic itineraries that provided for visits to industrial plants or agricultural and cattle-rearing areas that showed the most representative activities in the different regions. The illustrative support material distributed among the participants and the living experience acquired made it possible to give another meaning to their teaching of geography classes about the country in their transmission of knowledge, both at secondary school and college level. The same modality is still in practice for the present-day Geographic Weeks, and also for the Geography Meetings of Cuyo, organized by the Geography Institute of the National University of Cuyo, in Mendoza.

In practice, differences have to be made for implementation at primary and high school level on the one hand, and at college level on the other.

At primary and high school level, field trips are scarce or almost non-existent. This is due to the very rigid structure of school activities that make it difficult to undertake field outings. The situation is further complicated due to the responsibilities imposed on the teachers in case of any personal mishap. Even though at administrative level regulations have been dictated tending to make bureaucratic dealings more flexible, these measures have not been able to revert the predominant situation. There are exceptions, of course, especially in schools officially dependent from the university government and in some private schools, in which the students' socio-economic condition makes the expenses of a field trip affordable. But even in such exceptional situations, and with the educational benefits they bring about, field outings are simply pedagogic itineraries to visit certain locations without ever constituting a true field work activity.

In order to know what was the situation at college level, colleagues from different Geography Departments in the country and in the rest of Latin America were requested to send in information concerning this subject. While there was not a massive response, the information obtained was enough to present a picture of the existing situation.

Modalities currently present in the curriculums of college level Geography studies are the following:

- Programs in which no explanation is given about field work or field outings.

- Programs in which field works are outlined, with the number of hours to be completed, length of itineraries, presentation of reports, etc.

- Programs in which there are no rigid guidelines but rather field work is suggested for the different courses, and interdisciplinary courses. In general, these Geography Departments had field work activities contemplated for in their earlier Study Trips, as a promotion requirement. At present, the economic difficulties posed by this type of undertakings has led the Geography Departments to eliminate the compulsory demand and to provide for a more flexible structure.

In any event, many of these situations are subjected to modifications being introduced in the curriculums.
Planning of these outings changed since the mid-seventies. Before that time, outings into the field had all the features of field trips. The itinerary was carefully studied, the different stops were planned for teachers to explain and show the aspects previously presented in the classroom, or to enlarge some of those topics. Most of the time, students limited themselves to take down notes in a rather passive attitude, even though some motor skills were developed. However, those first experiences left a very positive result. Along the walks and rides, students were introduced to and given practice on the difficult exercise of firsthand observation of reality.

By the mid-seventies several changes were perceived. Excursions or trips for study purposes started to include other activities in addition to observation. The gradual change from field trip to field work was perceived, thus preparing the student for the final graduation paper. Even though no reference was made to field work as procedural learning, in the analysis of the planning for many of such practices there was a clear intuition of the activities that must be included.

From the material supplied by colleagues from different Geography Departments, a table is presented on which the main activities for the different steps of execution are listed (see Table 3).

Two examples are used in order to show the grading of difficulties – fieldwork in a first year course to understand the effect of water resources on the organisation of a territory (Figure 4) and a field study in the final year of the course to develop a proposal on environmental ordering (Figure 5). In general, the teaching technique used is group work, since students rely on one another to accomplish a task which if done individually, it would be very difficult and time-consuming. Objectives in general tend to make students appreciate the value of field work. As for the steps of execution, it has been observed that many of them are accomplished though they are not always explained, in particular the requirements and the situations for application. There is lack of systematization of field work activity as a procedure. While the activities programmed for the initial courses consist of assessment of conceptual information and identification of elements and measurements, in the later courses students have to solve more complex assignments. For both field studies, the activities, techniques, conceptual contents are practically the same. The fundamental difference lies on the fact that the final-year study has a duration of four or more days, and is taken to a location that in most of the cases is in the provinces away from the university to which the students belong whereas the first year study is a single day experience in an area near the university.

Table 3. List of main students' activities in the different steps of execution of field work (in accordance with questionnaire responses received from the Geography Departments of Argentine universities and universities of Chile)

Step of field work itself - Record information	Treatment Phase	Phase of interpretation and explanation	Communication phase	Application phase
Observe in order to: - verify or identify against reality the elements presented in a topographic map - verify concepts of reality - list elements and their characteristics qualitatively - identify elements and their characteristics quantitatively - compare elements against reality - carry out interviews - implement questionnaires based on sampling	- ordering and classification - tabulation of results - correlation of two variables - application of treatment to relate more than two variables - recording data on a chart - deepen analysis by means of bibliography - drafting of graphs	- Description of sets - Establishing relationships between elements and sets of elements - Trying to give causes of phenomena dealt with - Application of explanatory models	- Elaboration of verbal report - Elaboration of thematic chart	- Evaluation of models - Proposal for territorial ordering

The sequence of execution can start with exploration of the field, with the purpose of pinpointing the problems, or perhaps with the utilization of an alternative route, as that of starting from a hypothesis.

5.6 Conclusion

Geographers in South America, the same as their colleagues in other continents, have considered field outings as a means of special value for professional formation. For a long time, the activities were restricted to direct observation. Even though direct observation, together with indirect observation, is an important channel of information, it does not represent field work in its totality. Within the context of the cognitive-structuralist theory - which serves as the basis for many of the current educational reforms - field work as a whole is situated within the procedural contents.

Just like for the learning of certain conceptual content, the learning of a procedure must consider as an integrated whole those elements of its specific learning with which the procedure is approached. This integrated whole, representing a complex network indeed, must be planned with due consideration for the different levels of knowledge of the students. It will be highly positive to undertake a vertical and horizontal integration of the different courses in order to gradually incorporate the techniques and operations that shall be put into practice.

The exercise of observation on the terrain, as well as the application of other mental operations, provide students with powerful tools to make a critical reading of reality, to formulate questions, or to present problems.

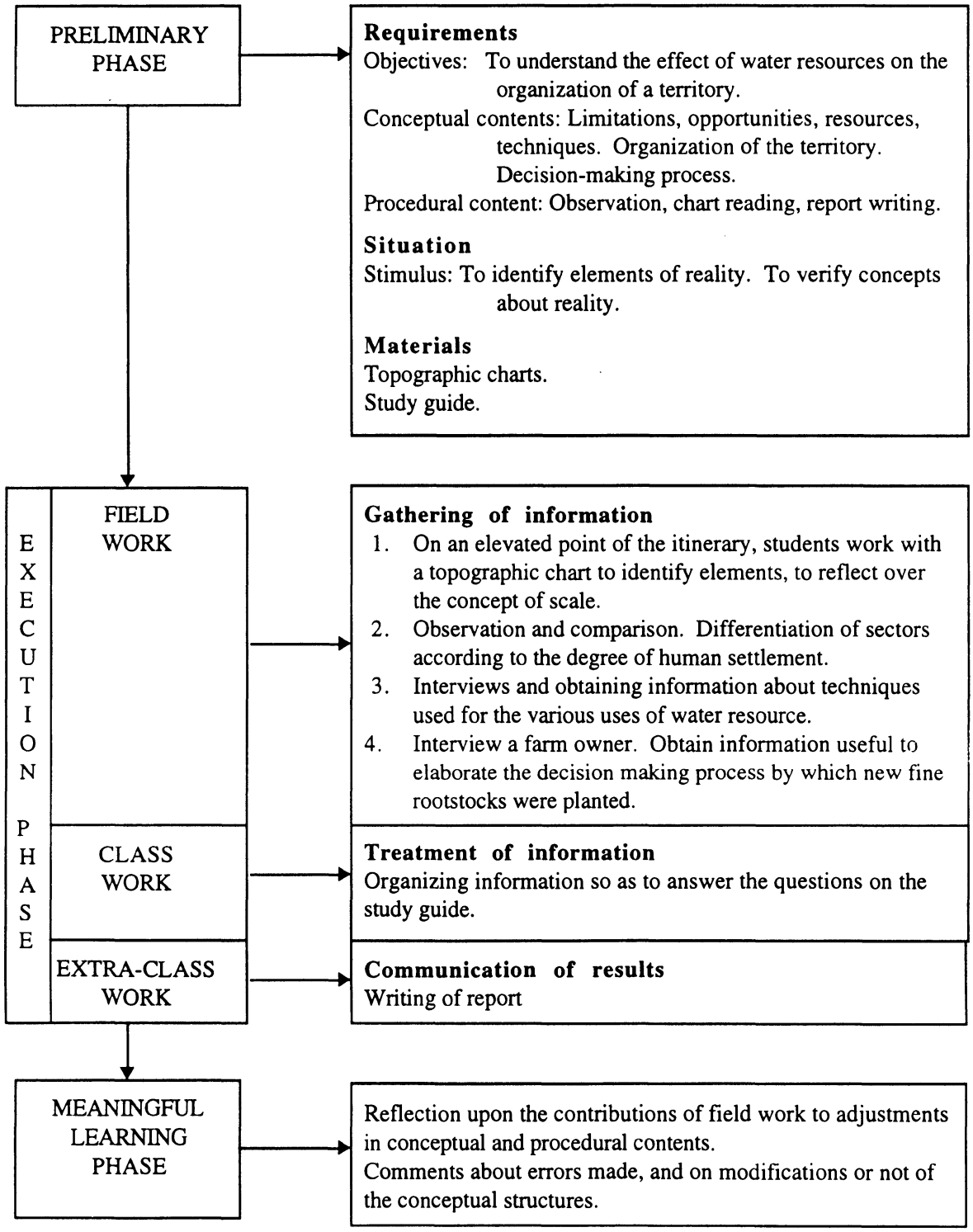

Figure 4. Schema of Field Work belonging to first year courses.[1]

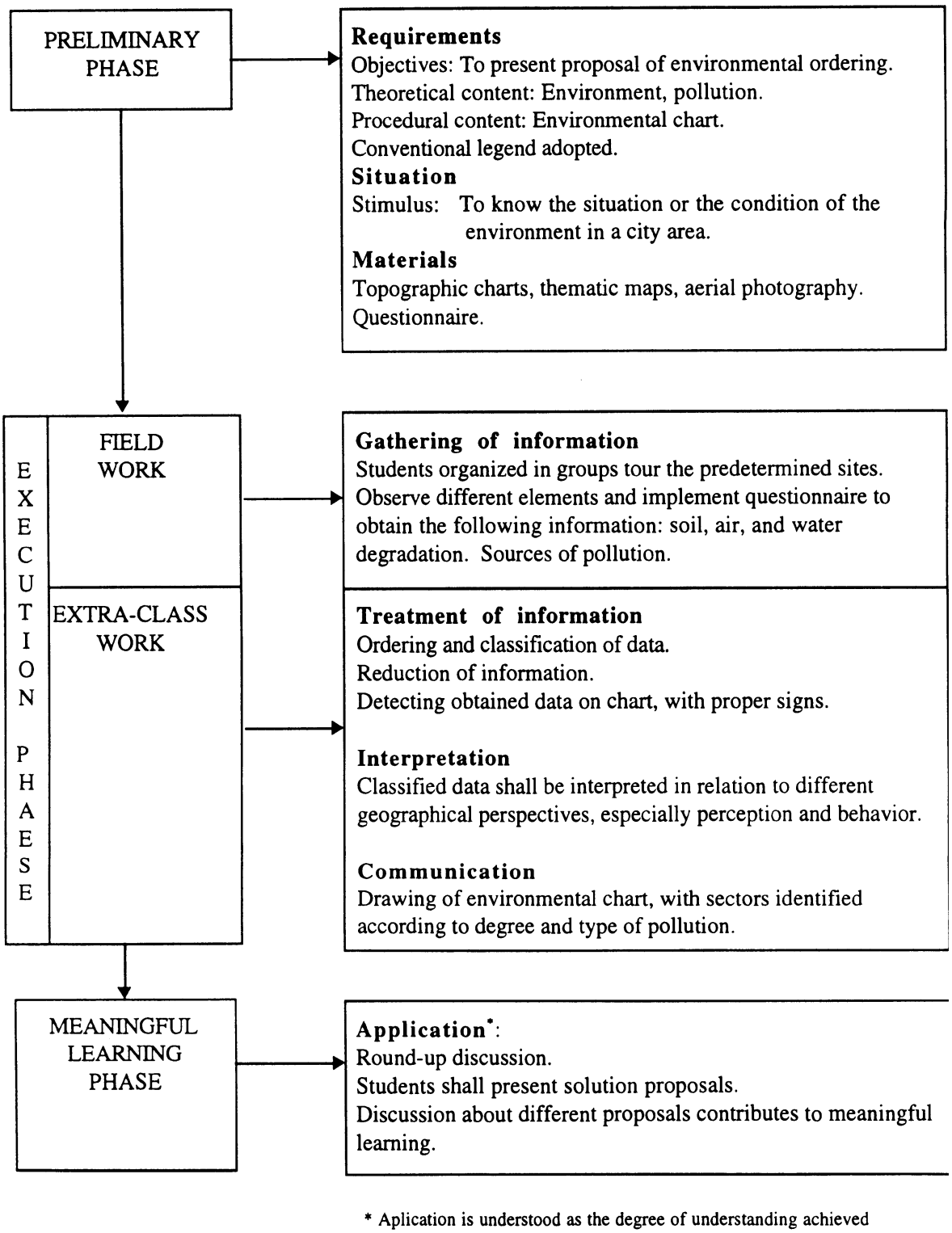

Figure 5. Schema of Field Work belonging to final year courses.[2]

The frequent practice of field work makes students aware of the polygenetic characteristics of the landscape. They will have been prepared to expect that the elucidation of the features and indicators observed will be achieved through the analysis of the complex cryptosystem underlying such observations. Diachrony -as the result of the crossing of the different tracks left on the terrain by the action of different processes - very frequently masks the true evidence. In order to carry out the work, it is necessary to resort to other documentation sources. Field work awakens the appreciation for the aesthetic value of the landscape, the respect and the responsibility for the delicate balance of the environment. Contact with reality enables the student to participate critically and with solidarity in the community, to make decisions that contribute to the solution of problems affecting the local territory. Meaningful learning of the field work procedure is a powerful means for the scientific formation of the geographer and in addition, it contributes to the transformation of the student into a well formed citizen.

Notes

[1] In the first year course, field work is a very simple activity, since students find themselves at the initial stage of their career, and have a very limited knowledge of conceptual and procedural contents.

This example has been elaborated based on the work guides of the following courses of the Geography Department of Universidad Nacional de Cuyo : *Introducción a la Geografía* and *Técnicas de Estudio y Trabajo en Geografía*. It has been adapted to the model proposed about the learning of a procedure.

[2] In the final year course, students have the mastery of many conceptual and procedural contents, and considerable experience in this type of activity.

This example has been elaborated based on the work guides of the following courses of the Geography Department of Universidad Nacional de Cuyo : *Ecografía de las regiones áridas.*

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6. STATUS OF FIELDWORK IN THE GEOGRAPHY CURRICULUM IN SOUTHEAST ASIA

GOH KIM CHUAN AND WONG POH POH

6.1 Introduction

Geography has been taught as a secondary school subject for almost a century in most Southeast Asian countries. In the universities, it would have had at least eighty years of existence as, for example, in Singapore where the Raffles College offered courses in geography as a minor component in 1928 (Goh and Cleary, 1991). In Indonesia, full-fledged university geography programmes did not commence until the 1950s (Adikusomo, 1990). However, the approach to the teaching of the subject in the region varies from country to country, much depends on the traditions indelibly left by the various colonial powers that ruled the respective countries. The British influence tends to be dominant in countries like Malaysia, Singapore, Myanmar, and to some extent Brunei Darussalam while the Dutch tradition is evident in the case of Indonesia while the French in the case of Vietnam, Laos and Kampuchea. A strong North American influence is evident in the Philippines, although geography as a subject in that country is not as strong as in the rest of the region, while the same influence is discernible in the case of Thailand even though that country was not under its colonial rule. Other reasons for these varied but significant influences are that many early academics in the geography departments came from these western European countries, and many locals have had their postgraduate training in the previous colonial countries. Despite this variety of traditions influencing geography in Southeast Asia, fieldwork has remained an integral part of geographical inquiry. It is implicitly assumed in the region that the learning of geography without fieldwork would be deficient and that it bridges theory and abstract concepts on the one hand, with classroom learning and the real-world experience, on the other.

Developments in geography in countries in Europe and the North American continent and, to a lesser extent, in Australia and New Zealand continue to exert strong influence on the way the discipline is perceived and taught in the region. It is almost true to assume that what developments take place in the geography curriculum in Europe and America would have a direct trickle down effect on the way geography is taught in the region. Herein lies the danger of Southeast Asian geography in that it unquestioningly

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 99-117.

imports and follows, in many cases wholesale, what have been developed in an essentially different environment in response to different needs. This concern applies to fieldwork in geography. There is little questioning of the value of fieldwork in the geography curriculum to meet the needs of national goals of these respective countries, especially in a situation where geography as a subject is getting less and less official recognition. In England for example, much has been debated about the value, purpose and effectiveness of fieldwork in the geography curriculum. New ideas have been generated as a result, which serve to engender improvements in the nature and effectiveness of fieldwork in light of new contexts posed by larger classes and increased costs in universities (Kent, et al., 1997). Because of much discussion and strong articulation of their views, geographical groups in England have managed to make themselves heard, and have brought pressure to bear on curricular reforms in the country. Geography's position as an important core curricular subject has remained relatively intact and fieldwork as an approach to studying geography has been incorporated as a component in the A-levels examination (see for example Bradford, 1995).

Instead of questioning the value, effectiveness as well as the practice of fieldwork itself and charting its own tradition with respect to this activity, geography curricula in schools and the universities in the Southeast Asian region has continued to replicate those that have been developed in the more advanced countries. And yet when it comes to fieldwork as a component in national examinations, this has not been introduced at all.

The above concerns notwithstanding, an appreciation of the status, nature, types and rationale of student fieldwork carried out in the region is needful, but so far this has not been attempted. The lack of information from the various Southeast Asian countries has made such an attempt difficult, and this is compounded by the variety of national languages in which geography as well as other subjects is taught and the curricula written. Despite these hurdles, this paper is an attempt to piece together a picture on the status of geographical fieldwork in Southeast Asia based on a questionnaire survey, personal communications, reading and travels, and the authors' own wide experience in teaching, research and fieldwork forays within the region. This paper does not cover all the Southeast Asian countries and, therefore the broad strokes on the subject may not do justice to the actual variety, vibrancy or value attached to fieldwork by each country in its geography curriculum. The regional perspective provided here would focus more on the subject at the tertiary level although some remarks will be made with respect to school geography first. One must also bear in mind that fieldwork is not peculiar to geography but has been and continues to be advocated by other disciplines such as biology, history and other disciplines. The current emphasis on encouraging independent learning in schools and letting students take control of their learning process through efforts such as integrated project work will make fieldwork an important feature in the new curriculum. There is no doubt that geography lends itself well to integrated

project work and the long experience in such holistic educational exercises makes the geography student and teachers well placed to lead in such cross-curricular activity.

6.2 Fieldwork in Geography at the School Level

Geography has been recognized as a compulsory school subject in almost all Southeast Asian countries but only up to the lower secondary level, beyond which it is an optional humanities subject that is facing stiff competition from History, English Literature, Art and others. At the secondary school level, it remains as an arts subject, but in Singapore, students in the science stream can offer geography as an A-level option, although the number involved is small. Geography has been facing serious challenges in recent years, and in some ways, the present position of geography in the region is very much like that of the more developed countries. Geography is recognized as a subject that provides a good general education with useful knowledge of the environment and skills to aid in that understanding. In some countries like Malaysia, history has upstaged geography due to official pronouncements recognizing it as necessary to a proper appreciation of nationhood. This means that geography has been sidelined at the 'O' and 'A' Levels, despite definite interest and preference shown by pupils to read the subject. As a result of this 'unwritten' policy geography in some secondary schools in Malaysia has ceased to exist, and geography teachers have been re-deployed to teach other subjects. On Penang Island, out of approximately a dozen form-six schools, only one currently offers geography to a group of about 20 lower six students. In Malacca, for the first time in its history, the premier Malacca High School no longer offers geography as a subject in the lower-six[1]. Though anecdotal, these cases serve to show the extent of the decline of geography in Malaysia. Recent pronouncements by the Prime Minister to encourage students to do science and IT, at the same time deprecating the arts subjects including geography did little to promote the subject.

In Indonesia, Adikusomo expressed fears about the strength of geography in high schools outside Java where more than a quarter of the geography classes was taught by teachers who had no college training of any kind in geography (Adikusomo, 1990). In such a situation, fieldwork and other geographical knowledge and skills would not be properly taught to geography students, if they are taught at all.

In Malaysia, at the lower levels fieldwork activity gained greater importance through a compulsory course work that every Form three geography students have to do. This coursework, which is in the form of a folio that students have to submit, is marked, and it accounts for thirty per cent of the overall geography marks in the national PMR (Penilaian Menengah Rendah) or the Lower Secondary Assessment. This was introduced in 1993 and, given the enthusiasm with which students carried out their

[1] Lower six is equivalent to year 11 in Britain or Australia.

research through fieldwork, it promised to revitalize the subject in the country. However, this optimism did not last long because, about two years ago, due to strong parental objections and the sheer pressure it created on students, parents and teachers, the course-work has taken a more diluted form. Students are no longer expected to carry out fieldwork and in its place teachers provide information, data and other necessary materials for students to analyze during class hours, and a folio prepared for submission for examination afterwards.

Other activities that lend themselves to student involvement in fieldwork, but not necessarily through geography, include each school adopting a river under the 'Love Our Rivers Campaign' in Malaysia, or through 'Adopt a Park or Beach' scheme in Singapore. Pupils are encouraged to monitor river water quality, measure discharge, compile an inventory of plant species and other related activities to create an awareness of the natural environment. It is thus ironic that geography no longer plays a leading role even though it is a subject that lends itself to those activities within this atmosphere of encouraging fieldwork, whether for a broader education or for general environmental awareness.

In Singapore, the situation with respect to geography at the higher school levels is more sanguine in light of the recently introduced National Education (NE) Curriculum. Although, as in Malaysia, the need to understand and appreciate the nation's beginnings and its progress since independence would render history the more favoured subject in the context of NE, geography has been able to hold its own. National Education issues dealing with nation building, Singapore's vulnerabilities as a result of limited resources and space, globalization and the importance of a strong sense of place and citizenship, can well be discussed within geography, thus making it an equally valid and relevant subject in schools. In fact, with this recent emphasis on National Education, geography in Singapore has gained in importance. In practice, the importance of NE has now been translated into the teaching of Social Studies at all levels in the primary school from the year 2000, instead of from Primary 4 to 6 only in the past. Social Studies has also been extended to the secondary levels and in the form of a new subject called Combined Humanities which will be compulsory at the 'O'-levels in 2002. Under this subject social studies will form the compulsory component while an elective is chosen either from geography, history or literature. This does not mean that geography, as single O-level subject, is no longer available. Students can still choose this option, on top of the compulsory Combined Humanities. Although Social Studies is a essentially hybrid of history, geography, sociology, economics and some elements of civics, it is evident that the objectives of the National Education ensure that a significant dose of geographical knowledge and skills could be still be taught to school pupils. Certainly, within this component, fieldwork would form an important means of imparting National Education messages and bringing about a better appreciation and sense of place among school pupils.

Geography in Singapore has always occupied an important position in the school curriculum. This is made possible through the active role played by the Curriculum Planning and Development Division (CPDD) of the Ministry of Education, university academics from the two university departments of geography, the Singapore Geography Teachers' Association as well as the Southeast Asian Geography Association. The geography specialists in the CPDD together with some academics and teachers have, in the past, consistently mounted field camps for secondary school pupils during the school holidays, but these have been discontinued in the last four years. In place of field camps which were held within the country and, in wishing to encourage fieldwork outside Singapore and to know the region better, the CPDD was instrumental in locating fieldwork sites in neighbouring countries so that teachers can bring their geography pupils on such residential fieldwork outings. One such site is the Wanagama Reafforestation Centre in Jogjakarta, Indonesia. Besides such specialized fieldwork centres, secondary schools and junior colleges are also actively taking their students on fieldtrips to countries further away such as to Africa (eg. Zimbawe, Kenya, South Africa), Europe, Australia and New Zealand, and China, besides those within the region. Most of the trips to Africa by junior college students are related to their A-level examination in which map analysis and interpretation form a compulsory component of their paper, and in most cases topographic maps of Africa are used. Given the relative affluence of its people and the Ministry of Education's funding allocation which schools can utilize to subsidize the costs of field trips abroad, field trips have become a regular feature of Singapore school geography.

The role played by the Southeast Asian Geography Association in Singapore is also significant. Two nation-wide seminars on the teaching of geography, particularly geomorphology were held in 1995 and 1998 for all secondary school and junior college teachers. Among topics discussed by eminent geographers were those related to fieldwork in geography. A workshop for secondary school and junior college teachers on geomorphological fieldwork to be conducted by Professor R.C. Twidale of the University of Adelaide is planned for early December 1999, which will also include a fieldtrip to explore the spectacular granite landforms on Karimun Island, Indonesia. The Geography Division, National Institute of Education, Nanyang Technological University has been running in-service courses on fieldwork for secondary school teachers. Currently, one staff of the Division is helping geography students in two secondary schools to undertake fieldwork projects using IT on an experimental basis, and there is potential that this could be extended to other secondary schools in the country. These joint efforts have to a large extent kept geography vibrant. Without doubt, interest in fieldwork has made geography popular among students in secondary schools and junior colleges in Singapore. It is apparent that this interest is also reflected in university geography enrolment among the arts students.

For fieldwork to be effective teachers themselves should be well aware of what (such fieldwork planning, execution in the field, etc) it entails and must be convinced of its educational worth. In order to up-date teachers on fieldwork techniques in-service courses on 'Teaching of Geography through Fieldwork' have been conducted for many years by the geography division of the National Institute of Education. Knowledge on how to conduct fieldwork obtained from the in-service course would not be sufficient without teachers regularly going out to do fieldwork themselves. In this respect, the Singapore Geography Teachers' Association has been instrumental in organizing 'Cook's Tour' type of fieldtrips abroad, the latest in December 1998 to Vietnam. A range of physical and human geography landscapes was studied on that trip. A trip to China is planned for the December 1999 holidays and some 35 secondary school teachers will take part in this fieldtrip. While geography teachers in Singapore have been active in student fieldwork, one worry is the lack of male teachers. Yet despite the high percentage of female geography teachers, fieldwork has been encouraging (Wong, 1990); field trips have been organised regularly to places within and outside Singapore.

Another boost to geography fieldwork comes from a concerted effort by the Ministry of Education, Singapore to encourage independent, creative and critical learning through project work of an interdisciplinary nature. This initiative follows the revision of university admission criteria which was announced recently (The Straits Times, 14 July 1999) whereby project work will feature as one component in the admission criteria[2]. In anticipation of its implementation in 2003 schools are now encouraging project work of various kinds. Geography is in an enviable position to capitalize on this for the simple reason that fieldwork-based research is not alien to geography students.

In Brunei Darussalam, Elgie (1990) has conducted a survey of Government Secondary School geography departments in the Brunei-Muara District in 1989 and he was surprised to discover the gap between the intentions and practice of fieldwork for Forms 4 and 5. While all geography heads interviewed agreed that fieldwork was essential in geography teaching, only one school out of eight had taken students out on a structured fieldwork exercise. He attributed this lack of student fieldwork to the lack of both commitment and experience of teachers.

It is apparent that the status of fieldwork in geography in the other Southeast Asian countries is intertwined with the position of geography education in the school

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[2] University Admission Criteria A-Level Students

	2003	**2004**
A Levels	75%	65%
Reasoning Test	25%	25%
Project Work	-	10%
Extra-curricular Activities	Bonus	Bonus

curriculum. Various authors representing some of these countries bemoan the decline in importance of the discipline over the years. Some have attributed this decline to the limited time and the wide range of topics to be covered in the secondary school syllabus. As a result of school curricular adjustments geography has to give up some time in order to accommodate other more essential subjects (Adikusomo, 1990; Pongprayoon, 1990; Voon, 1990). Another reason could be the short supply of well-qualified geography teachers (Adikusomo, 1990; Wong, 1990). Evidently, the picture is not complete for the region as a whole as very little information is available from countries like Myanmar, Laos, Kampuchea and even the Philippines. If the number of geography departments in universities in such countries is any measure of the strength of the subject, and by extension, the significance of fieldwork in geographical inquiry, then it would appear that Myanmar would lead the pack. There are some 29 university geography departments in the whole of that country (Maung Maung Aye, personal communication).

6.3 University Geography and the Nature of Fieldwork

There is strong conviction within the region on the need for fieldwork for all geography undergraduates and the dictum that geography must be learned through the 'soles of one`s feet' still holds true. So is the belief that fieldwork is "the true geographical experience" which makes the subject "come alive for the thrill of exploration and self-discovery" (Shamsul et al., 1972). But fieldwork appears to have various meanings as reflected in the way it is conducted and assessed among geography departments within the region, echoing the point made by Gold et al., (1991) with regard to geography fieldwork in Britain. Fieldwork as understood within the region has different connotations. It varies from the compulsory or optional `Cook`s Tour` type to a day in the field as an activity within a geography elective, to a compulsory residential fieldwork within the country or abroad, and to a semester or a year's stint as instructor-planner in a village. This great diversity is reflected in Table 1.

Table 1 Aspects of fieldwork carried out in Geography Departments in some Southeast Asian countries

Country	Fieldwork Type	Duration	Student Group	Site Location	End Product	Assessment
Brunei	Intensive, residential	One week	Final year majors	Within the Country	Individual Academic Report	Compulsory, Constitutes one core module
Malaysia	Intensive and varied	One week	Final year majors	Within the country	Individual Report	Compulsory, Constitutes a core module
	Field trips	Half-day	First to final year modules	Within the country	With or without short reports	No assessment
Myanmar	Intensive Fieldtrips	Two days	First to final year courses	Within the country	Submission of a field report	Compulsory
	Intensive Fieldwork	One week		Within the country	Individual Research report of 15000 words	Compulsory and constitutes 20 of the geography course
Singapore	Fieldtrips	Half to One day	Individual modules	Within the country	Submission of field report	Not for all modules, but compulsory for all students if conducted in a module
	Residential, intensive fieldwork (only at NTU)	2-weeks pre-, fieldwork proper and post field work activities	Final year students	Outside Singapore	Submission of individual research report of 4000-6000 words	Compulsory, and constitutes a core module
Vietnam	Fieldtrips	Half to one day	Depends on courses	Within locality	Submission of short reports or maps	Assessed
	Fieldwork	2 weeks on geodesy/topographic mapping	Second year majors	Within the country	Reports and maps	Assessed
		3 Weeks on basic geography	Second Year majors	Within the country	Reports	
		3 weeks in professional subjects	Third year majors	Within the country	Reports	
		4 weeks	Thesis subject or diploma in field work	Within the country	Reports	

The Geography Department, National University of Singapore used to have compulsory fieldwork for first year undergraduates in the first year human and physical geography courses. Hence, students were asked to complete a traverse through a part of Singapore to produce annotated profiles; student groups measuring and recording temperature and humidity at various locations on the island, conducting simple questionnaire surveys or traffic counts. In some years, first-year students had to submit individual reports based on fieldwork conducted around their home district. This was an interesting learning process for students and also possible at a time when Singapore had a much more varied geographical character than the present day where public housing estates predominate. Like many geography departments in the region in the sixties, seventies and even in the eighties, surveying was considered an essential geographical skill in the University of Singapore where all first-year students had to carry out surveys on the Bukit Timah campus using compass, plane table, level and theodolite. With increasing numbers of first year students (from about 50 to more than 250 students), the field work component has become more difficult to implement for every student. Students are now taken in buses for general field trips. Surveying was weaned out as other geographical methodologies became more important, e.g GIS and other methodologies in human geography. To some extent, this was balanced by a wider variety of laboratory classes that have gone beyond mapping and rocks, to look into geomorphological, geological and hydrological techniques. At one stage, when the Department had a field station, batches of students could be put through in various field techniques on meteorology and soils. The field station was also popular with teachers and for several years several field courses were conducted for geography teachers. However, the loss of the field station where the site was required for an electric substation had certainly not helped physical geography in the 1990s. While fieldwork is also incorporated in other physical geography electives such as biogeography, coastal geomorphology, fieldwork in human geography electives at the National University of Singapore range from visits to various organizations, questionnaire surveys to structured fieldtrips on landscape interpretation. Field techniques were also included for several years in a compulsory techniques course. This course was not well received by students and it subsequently became an elective.

Field trips lasting half-a-day or one full day are conducted by many geography departments in the region but they are not necessarily commonplace. They are usually conducted within the optional courses by staff concerned, but not all electives adopt it as a common practice. There is a tendency for more fieldtrips of this kind in physical geography related modules than the human related courses. Such trips are becoming more difficult to organise as the problem of having a time-block off is real, especially in the semester system that most universities in Southeast Asia are operating on and with big student enrolments.

From a questionnaire survey of geography departments in Southeast Asia it became clear that very few departments hold field trips for first year students as an induction course held early in their degree programme (Gold et al., 1991), as is the practice of many geography departments in Britain. Such field trips have the benefit of bringing students of geography together, to provide opportunity for them to know one another and hence lay the foundation for cooperative work in their subsequent years of study. Such fieldwork also serves to induct new students into the departments by providing them an opportunity of getting to know the staff thus creating a sense of belonging to the department and the discipline. It is also instructive in providing a means of determining what students do know from their junior college geography, given the variety of such colleges and instruction.

6.4 Models of fieldwork in geography departments: some examples

Several models of compulsory fieldwork have been adopted by geography departments for their students in the region, and this is usually conducted in their senior years as one major experience in their three or four year undergraduate course. Obviously the objectives, the nature and programme of the fieldwork, and what is expected of students afterwards, vary a great deal from department to department. Even within Malaysia where there are three geography departments fieldwork varies greatly. At the University of Malaya and the National University while fieldwork is compulsory it is not examinable whereas it constitutes a compulsory one-semester module at the University of Science (Voon, 1990). Such fieldwork involves a large number of students (more than 150 each year) under the guidance of lecturers. Very often such field trips will take them to other parts of the country to look at geographical issues more closely. Such issues involve actual geographical situations and relationships at the local level, particularly those relating to development and its impact on the area of study, studies of settlements, agricultural, industrial and other projects (Voon, 1990). These field trips are very often supplemented by briefings given by officers from state or federal government departments. While students are expected to hand in a short report, the report does not carry any marks and hence has no bearing on the final examination results. At the University of Science Malaysia, fieldwork is a core module which students must pass to graduate. In this case , fieldwork would involve all students gathering data on a research topic, coding and analyzing them and the results used for individual reports to be submitted for examination.

This type of fieldwork is also offered at the geography departments at the University of Brunei and the Nanyang Technological University respectively. To elaborate, fieldwork proper may be supplemented beforehand by lectures given by staff to prepare students for this exercise. In the field, briefings by government departments will be held (early in the fieldwork) to provide the necessary background for the research problem under study by students. Students will then carry out field surveys depending on whether the

research topic is physical geography or human geography biased. In the evenings, sessions will be held when staff and students discuss the problems encountered during the day so that improvement in data gathering could be made for the following day. After the completion of the fieldwork proper and, on their return to home base, information and data collected would be analyzed by students using statistical, GIS and other appropriate techniques with lap-tops brought along for that purpose. The common results obtained from such analyses are then distributed to students who will then write their own individual reports to be submitted for examination. At the geography departments, University of Science Malaysia, University of Brunei and the Nanyang Technological University, the introduction of this type of field work owes much to the initiative of one of the authors (Goh) in his capacity as head at each of the respective departments. Its introduction was highly motivated by his unsatisfactory experience of fieldwork that he, as an undergraduate, undertook almost three decades ago when students like him were 'used' as cheap labour for staff's own personal research. It is to ensure that maximum benefits of fieldwork accrue to students that this form of fieldwork as a core module properly structured and conducted, was introduced in the geography curriculum at the three respective departments.

In some departments fieldwork has become an important part of the honours course. At the National University of Singapore, the greatly reduced number of students in the honours course made it possible for them to benefit from fieldwork in two ways, from the department and from doing the honours thesis. Up to about 1966, various staff of the department took honours students to Malaya (present Peninsular Malaysia) for fieldtrips to observe and learn additional field techniques. Thus students were taken to historical Malacca, fishing villages and granite tors in Johor, beaches along Trengganu coast, etc. Some honours students also undertook field work for their theses in Malaya. Dobby, E.H.G, the first professor of geography at the University of Malaya[3] was a strong advocate of fieldwork and virtually posted honours students to do their field work in various parts of Malaysia. It was then known that the department attracted few female students in honours year because of the rigours of fieldwork that could last up to a month in the paddy fields of northern Malaya.

Fieldwork has continued to form a strong basis for the honours thesis and has taken more depth and breadth over the years, if measured by the titles of the dissertations. It is at this stage that the student learns more about fieldwork and often directly from his supervisor. As not all students have the necessary surveying, mapping and other field techniques for his work, the supervisor will have to teach the supervisee the necessary field techniques. Through informal feedback, many students have commented that they learn a lot about fieldwork while doing their honours thesis.

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[3]Renamed University of Singapore in 1966 and subsequently amalgamated with Nanyang Technological University in 1980 to form the National University of Singapore

6.5 Benefits of fieldwork

Questions have been raised about the real benefits of fieldwork given the amount of time expended to plan and execute student fieldwork as well as the costs involved. Many benefits have been assumed to accrue to students such as developing the ability for independent work, developing observational skills through experiential learning, developing analytical, research and social skills, and respect for the natural world. But the actual effectiveness has not been objectively evaluated or assessed and there is as yet no clear evidence on the real value of fieldwork (Gold, et al., 1991). These concerns notwithstanding, the benefits of fieldwork should not be measured purely by empirical data. There are other ways of ascertaining its benefits, and from the experience of conducting such exercises over the years, the following are some ways of determining such benefits.

It is important to know how fieldwork fits into the overall geography curriculum of an undergraduate degree. Fieldwork, in the way that it is conducted at the three geography departments where one of the authors has been associated with, has always occupied an important position in the students' learning experience. In fact, fieldwork has been designed in such a way that it is the epitome of what students have learned in their first three and a half years of geography. It is intended that students must bring as much of what they know of physical and human geography learned in their earlier years to bear on the fieldwork research. And the use of techniques, be they map reading, GIS, remote sensing, statistical analysis and IT courseware development skills would be required of students to make sense of the data collected during their one week or more in the field.

Another important point to make is that fieldwork should also try to incorporate elements of physical and human geography. Thus very often the choice of topics and of places for fieldwork would have to be guided by this objective established beforehand. Given the variety of landscapes and issues that lend themselves to an integrated treatment from both the human and physical geography perspectives, there is no shortage of such topics to select or places to visit from within the region. Based on the authors' experience in planning students fieldwork over more than two decades, some topics which have been selected and which incorporated both the human and physical dimensions are shown in Table 2.

Table 2 Topics of fieldwork integrating both the physical and human geographical issues

Topic	Physical Geography Elements	Human Geography Elements	Place of Fieldwork
1. Flood problems of the Kelantan River delta	River basin dynamics, Meteorological conditions, Physical properties	Landuse, settlements, human perception of floods, costs, and adjustment	Kelantan, Malaysia - prone to floods annually during the winter NE Monsoon
2. River erosion within a meander	River dynamics, meander feature, river flow characteristics	Erosion as it affects a town, costs to roads and property, town planning issues, adjustment	Teluk Intan, Perak, Malaysia - The town is situated on the bend of a meander that is eroding rapidly its convex bank
3. Upland land use	Topographical attributes, rivers, erosion problems, and meteorological characteristics, warming	Tea cultivation, vegetable and flower farming, crop type and production, population involved, land title issues, slope conservation measures, costs, adjustments in terms of new farming techniques or change to different crops due to warming of temperature	Cameron Highlands -situated at about 2000 m above mean sea level is an important centre for the growing of temperate vegetables and flowers, as well as tea. It is also a popular upland tourist resort.
4.. Island water supply	Topographic features, catchment areas and river basins, river discharge, water storage and treatment works, meteorological characteristics	Water consumption patterns by various sectors, interviews of consumers, perception of water quality, services and management	Penang Island - highly urbanised and industrialised, limited water resources, issues of island water management
5. Decline of the Tin mining industry	Resource distribution, geological formation and topographic features, location of mines, erosion problems, water quality	Economic costs of mining, types of mines, market behaviour and employment, effects of the decline of tin mining on livelihood of people in nearby settlements	The Kinta Valley of Perak - the chief tin mining area in Malaysia.
6. Economic development of a fishing village	Coastal and sea characteristics, fish resource types, swamp ecosystem, aquaculture areas and water quality	Decline of sea fishing and growth of aquaculture as a thriving industry, output and income, employment and business opportunities	Kukup - a coastal fishing village in Johor, Malaysia
7. Upland resort	Physical characteristics, meteorological conditions, natural environment	Hotel and other development, tourist arrivals and types, facilities, tourist perception, income generation, social and environmental problems	Himachal Pradesh, Simla, India
8. Urban expansion	Types of land use, forest resources, soils, slopes and topography	Use of fire in forest clearance, crop cultivation, residential and urban development	Tutong and Kuala Belait Districts of Brunei Darussalam

The individual reports produced thus far have shown the capability of students in synthesizing and integrating concepts, theories and knowledge of human and physical geography while at the same time applying the various techniques listed above. Beyond the use of statistical, GIS and remote sensing and computer-aided cartographic techniques, students have been able, on top of their academic reports, to produce, in teams, multi-media courseware on topics researched during the fieldwork. Such products have become valuable resources for the teaching of geography in schools. Given the positive endorsement of external examiners of the fieldwork projects and the amount of learning taking place among students, this type of fieldwork will remain an important feature of the Geography Division's programme at the Nanyang Technological University, Singapore for a long time to come.

The benefits of fieldwork go beyond the immediate performance in a module or course. Students have affirmed the benefits that they have enjoyed through such exercises as indicated in the comments received voluntarily from participants. The sentiments expressed by a sample of returns are indicative of their attitude and response towards fieldwork of the whole class.

Student A - Fieldwork study on the decline of Tin-Mining in the Kinta Valley, Malaysia. (Note: The Kinta Valley is also rich in limestone features)

> *This trip was really a fulfilment of my wish to go on a geography 'adventure' since I took up the subject ten years ago. It was indeed a great experience.*
>
> *A geography student is never complete if he/she has never seen any geographical feature in relation to the numerous texts that can only provide small scale, 2-dimensional visuals. Thus it was indeed an eye opener to 'feel' how majestic limestone features can be.*
>
> *Well, apart from work, this fieldtrip had created a golden opportunity for me to foster new ties with course-mates whom I've never spoken to. In short, this trip will always be the pride for my future teaching career.*

Student B - fieldwork on water supply problems of Penang Island, Malaysia.

> *I really have to tell you that the entire fieldwork to Penang was indeed a wonderful and enriching experience.*
>
> *The survey work taught me a great deal. I learned and experienced the art of interviewing people across various economic and social backgrounds. And above all, I realised the amount of patience and determination that it took to be able to conduct a survey successfully and meaningfully.*

Student C - Same as above

> *The trip to Penang has been a memorable experience for me especially as it involved all who will be graduating soon. It helped us to build rapport with one another, not only with other students, but also with our lecturer. Initially, I thought the trip would be very taxing as it involved talks and fieldwork. However, it turned out to be otherwise. Even the surveys were exciting. Through this, I was able to meet and to get to know the locals better. I personally think that the fieldwork was the most exciting part of the whole geography programme.*
>
> *The exposure that I had in doing fieldwork has provided me with an array of knowledge about the lifestyle and culture of the people in Penang.*

While the above sentiments are qualitative, they serve to indicate emphatically the worth and value of fieldwork that transcends the immediate academic benefits. Fieldwork provides experience in problem solving, meaningful relationships, an opportunity of appreciating other cultures, and an exposure to environments other than our own. It is also fun which is an important ingredient in the "classroom without walls". The experience of being in another place, which to many Singapore students can be a culture shock compared to the predictable and orderly home environment, provides the students an sense of appreciation of 'other' places as well as of one's own.

6.6 Fieldwork issues raised from the Southeast Asian experience

To a large extent the pertinent issues raised by authors like Gold et al. (1991) and in particular Kent et al. (1997) in relation to the various modes of field teaching, value and effectiveness in the British context apply to the Southeast Asian scene. Several conclusions can be made from the discussion attempted above.

- There is a clear conviction that fieldwork is necessary and beneficial for students of geography. Arguments like fieldwork bridges theory and practice, making the classroom come alive, engaging students in designing and carrying out research thus preparing them for the demands of either higher education, teaching profession or work, and a host of others do apply. How the actual fieldwork fits within the overall curriculum, and why it is conducted at a certain level of the students` education, the extent of students` participation in the selection of study topic, design of research procedure and choice of site, and many others however, have not come out clearly.

- It also appears that very little by way of feedback briefing is conducted after students have completed and submitted their reports, and thus there seems to be a

premature break in the whole process of the exercise. Since the students are the learners, some mechanism of getting feedback to them, good or bad, should be provided. One reason for this absence of feedback may be that there is little time left for students to meet with staff for such sessions, as usually students will be caught up with the demands of other courses as well as the need to prepare for the semestral exams. Even when the reports have been submitted it will normally take quite some time before the lecturer or lecturers concerned are able to complete marking. And then there is the need for external examiners to validate the internal examiners' marking. The opportunity for feedback would thus be even more limited.

- Finally the effectiveness of the fieldwork in the Southeast Asian context has not been objectively evaluated. To what extent the field experience has enhanced learning of geography in terms of increased overall grades, more enlightened thinking in examination answers, and how significant this `value-addedness` is to the overall training of students or helped students in their honours research a year later is difficult to answer objectively. However, comments are deliberately sought from students in the case of the geography department at the Nanyang Technological University after each final year's fieldwork in the form of open-ended comments - positive and negative - that students are free to write and submit to staff in charge of the fieldwork. A sample of such comments has been shown above. Where a more structured questionnaire is given to students, remarks have been equally revealing. Such comments have been useful in helping staff to improve subsequent fieldwork endeavours.

6.7 Problems of carrying out fieldwork in Southeast Asia

Southeast Asian geography departments have progressed comfortably past the stage where their staff members are mainly locals, many with degrees from abroad. Much responsibility rests with the local staff to carry out fieldwork excursions, as much of Southeast Asia has not yet been properly studied. We strongly believe that they have to be masters of their own backyard before venturing to other regions, which unfortunately is not the case presently. Many new and applied ideas can be discovered from careful geographical observations and measurements in the field. It is through actual investigations in the field, and comparisons between sites that problems of development can be identified and models for better management of the environment could be proposed. In Southeast Asia, geography also has a social responsibility, as its ultimate aim is to contribute to the wellbeing of the communities and the betterment of the environment.

The varied problems and opportunities offered by Southeast Asia in terms of geographical fieldwork notwithstanding, there are inherent problems that do limit

opportunities for fieldwork investigations within the region. These could be historical in nature, practical as well as perceptual particularly with regard to security and safety when conducting fieldwork in countries 'foreign' to one's own.

It was alluded to earlier that the geography students at the University of Singapore in the 1960s had no problems of going into Peninsular Malaysia for fieldwork investigations. Singapore, being part of Malaysia, was within one country until its separation in 1965. Up to 1966, Malaya has been a natural choice for field trips because of its easy access and it has a wider variety of physical and socio-economic landscapes. As a student in school, one of the authors (PPW) remembered the many fieldtrips to Malaya during the 'A' level years - to a rubber estate, a pineapple estate, fishing villages, an iron mine, etc. The same applied to undergraduates. From 1966, regulations prohibited groups of Singapore students from meeting clandestinely in Malaysia. The detailed and official arrangements to be made to both Singapore and Malaysian authorities, greatly discouraged field trips made by Singapore students. This law has since been relaxed and field trips can be made easily.

Within Southeast Asia generally, inherent problems that discourage fieldtrips and fieldwork include some practical problems of language although fieldwork investigations that do not involve interactions with humans can still be carried out in such a context. It is not surprising then that Singapore students would be comfortable conducting fieldtrips or fieldwork in Australia than to do so in Thailand or Vietnam for reason of language. Another factor that discourages fieldwork in the Southeast Asian countries seems to be one of perception of security and safety. The division of Southeast Asia into the democratic and communist blocks and the conflict during the Vietnam War years precluded any trips from countries belonging to one block visiting others in another. Even today, the tight control imposed on foreign groups in countries like Myanmar makes it difficult to carry out fieldwork there, and certainly, recent turmoil and inter-ethnic conflict on many islands of Indonesia also discourage groups from conducting fieldwork in those areas. The question of safety of members in any group on fieldwork trips to another country or even within one's country is a paramount consideration to parents and institutions. In the case of institutions, students who are below twenty-one must ensure that a parent signs an indemnity against liability form, or in the case of those above that age their own signature would suffice. The form declares that the student shall have no claim whatsoever and howsoever against the organisers or the institution for any mishap or injury or loss of any kind including loss of life that may be sustained during the whole period of the fieldtrip or fieldwork.

6.8 Conclusion

The value of students fieldwork in geography has been affirmed more by the implicit assumptions and quiet acceptance of its worth than a vociferous articulation of its value

or defense against its shortcomings. This has been true of the geography departments in Southeast Asia where fieldwork of one kind or another is conducted to further the understanding of the subject matter. The variety and wealth of cultural and physical landscapes, and research problems within such an heterogeneous milieu - environmental, social, cultural, economic and political - of Southeast Asia should challenge the geographer to carry out fieldwork to test and discover new theories and explain various geographical phenomena in the field despite the difficulties mentioned above. It is the well structured, organized and executed fieldwork conducted in the context of the curriculum that will ensure geography's continued relevance and vibrancy as a subject that prepares students for the real world. The competent application of skills and tools that geography students are taught including the more up-to-date GIS and remote sensing and other IT techniques for fieldwork projects make the geography students better able to combine a repertoire of skills and appreciate the complexity of the real world. Geography departments in the region recognise that the marketability of their graduates in a diversity of occupations could be enhanced by giving emphasis to problem-solving skills and techniques, including techniques of research and field work. It is this that geography in Southeast Asia, whether at the school or at the tertiary level, should aim to achieve and excel.

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7. FIELDWORK IN GEOGRAPHY TEACHING : THE CASE IN HONG KONG

TAMMY KWAN

7.1 Introduction

In Hong Kong, teachers will agree that geography is a lively subject which frequently involves students doing practical work in the actual environments in order to introduce, reinforce and develop both general and subject specific skills; to provide the opportunity for first hand and experiential learning; to allow response to the challenges of different environments; to allow textbook derived knowledge to be sorted, confirmed and clarified; to allow fragmented or compartmentalized knowledge to be integrated into a coherent whole; and to facilitate the development of tacit knowledge (Keung, 1986; Leal Filho, 1993; Lonergan and Andresen, 1988; McEwin *et. al.*, 1996). However, local research indicates that Hong Kong teachers are not keen to conduct fieldwork with their students and that 50 per cent to 75 per cent of the Secondary 1 to 5 geography teachers did not conduct fieldwork for their students (Ip, 1988; Keung, 1986; Wu, 1992). For those who did carry out fieldwork with students, the fieldwork tends to be unstructured and not well organized. We may perhaps barely classify such organization a field teaching technique (Hill, 1976) or simply a 'Cook's Tour' where sight seeing is to take place in the open (Kent *et al.*, 1997).

This chapter will base on the case of Hong Kong, to reflect on its recent curriculum development and revision on the three geography syllabi to expose the way how field work has been and will be treated by the geography teachers. The problems and issues arising from carrying and not carrying out fieldwork will be addressed. The possible future direction that teachers should go about doing fieldwork with the students is suggested with the hope that fieldwork in geography teaching will have a brighter future to move into the new millenium of the Hong Kong education system.

7.2 What is fieldwork and why does it occupy a special position in the geography curriculum?

Fieldwork is any structured experience that takes students to learn outside the classroom, when the object of their studies – whether it is a building, geological site or museum – is also the place where the students study. The field trip can be a brief visit for an hour or a day, often it can involve an overnight stay or last for a week or more and is likely to be formally assessed to indicate the students' learning outcomes (Jenkins, 1997). Foskett (1997:190) further elaborates that such outside classroom activity "provides pupils with experiences, knowledge, understanding or skills form part of the geography curriculum".

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 119-130.

At the very low level of understanding, fieldwork perhaps can be described as just the simple transference of words from the textbook into a real learning environment. But Lonergan and Andreson (1988:70) made it explicit that "effective learning cannot be expected just because we take students into the field." The effectiveness of fieldwork has to be seen as a method of planned discovery (Boud and Feletii, 1991; Hill, 1976) that teachers need to prepare situations which allow students to work purposefully and meaningfully in a particular environment so that they find and confirm geographical facts and ideas in a holistic manner by using a number of geographical fieldwork techniques for themselves. At a higher level of conducting fieldwork, students are expected to involve in hypothesis testing with the underlying fieldwork objectives to train students' ability in observing and reasoning which are also very important to prepare them to be the citizens of tomorrow. As a result, fieldwork for students has long been viewed as providing the opportunity to reinforce and develop their knowledge base in geography, to formulate and test geographical hypotheses and to respond to the challenges of environments distinct from previous geographical experiences (Lonergan and Andreson 1988; Foşkett, 1997). Bland *et al.* (1996:165) stress the importance of doing geographical fieldwork that "in Geography if without fieldwork is like science without experiments; the 'field' is the geographer's laboratory where young people experience at first hand landscapes, places, people and issues, and where they collect data, learn and practice geographical skills in a real environment."

With these significant characteristics that one can find in the conduct of fieldwork, it is natural for fieldwork to become a central theme in geography curriculum planning. Its importance is reflected in the revised geography National Curriculum in UK that "fieldwork should not be an optional extra, [for] pupils are entitled to ... regular, purposeful and integrated fieldwork" (DES, 1990:85) and the Department for Education (1995:2) "requires that all pupils undertake fieldwork". The study of geography in America is to "develops powers of observation in fieldwork to record and organize complex phenomena" (Natoli *et al.*, 1984:9). Conolly, current president of Australia Geography Teachers' Association, stresses that "Fieldwork is the Geography outside" (1997:43) by providing students opportunity to learn how to observe and record features and activities and how to gather data for classroom analysis. Given the international emphasis as the background support, the next section proceeds to look at the status of fieldwork in the Hong Kong Geography Curriculum.

7.3 The current fieldwork status in the Hong Kong Geography Curriculum

There are altogether three syllabi in Hong Kong Geography school curriculum, namely the junior secondary one to three (S1-3), the senior secondary four to five (S4-5) and the advanced level (S6-7). The geography syllabi have undergone a series of major change in the late 1970s to early 1980s (Biddle, 1979). The focus changed from the traditional regional approach to one, which emphasized on people-land interaction using issues-based approach to study geographical phenomena (Haubrich, 1992:10-11). At the knowledge level, the accentuation on people-land interaction is to help students to learn and understand how people depend upon, adapt to, are affected by, use and modify their environment using fundamental geographical concepts. At the skill level, the intent is

to encourage a balance between active inquiring skills through fieldwork, and discipline-based skills through graphicacy and mapwork (Chan, 1997:22). The combination of the two will lead to the development in students their personal and social values that contribute to the betterment and well being of humankind (CDC, 1992:7). With this understanding, this section will outline the extent that fieldwork is mentioned in each syllabus to reflect its expected educational contribution to geography learning in the Hong Kong schools.

Among the three geography syllabi, the junior S1-3 syllabus is the most recently revised and will formally put into implementation in September 1999. It highlights the significant importance of teaching geography by an issues-based approach. The senior S4-5 syllabus, the oldest version among the three as it was last revised in 1984 which focuses on themes of land and population and also the related issues arising from the people-land interaction. The syllabus, however, is currently under revision and is planned to put into implementation in 2001. The advanced level of S6-7 was last revised in 1986 and was presented in the form of an examination syllabus only. It was not until 1992 that a formal teaching syllabus was prepared by the Curriculum Development Council of the Education Department of Hong Kong, which stressed the different landscape interpretation. Here, I will help the readers look at how fieldwork is being addressed in these three geography syllabi according to their time of syllabus drafting or revision. The purpose, here, is to locate any the hidden and/or explicit implications of expecting what teachers can do about fieldwork in the three syllabi.

7.3.1 1984 SENIOR S4-5 GEOGRAPHY SYLLABUS

The1984 version of the S4-5 syllabus did not contain any explicit paragraph describing the importance of fieldwork like those stated subsequently in the S1-3 and Advanced Level Syllabi. The 2-year syllabus suggested the teachers to use 160 lessons of 40-minute each to cover the whole syllabus. It was only mentioned very loosely in particular topics where Hong Kong is used as local examples for illustration that geography teachers are 'reminded' to 'conduct fieldwork whenever possible'. These include the topics of denudation, fluvial processes and landforms, coastal processes and landforms, farming system in Hong Kong, and urban land uses and factors affecting their distribution in Hong Kong (CDC, 1984:8-10). However, there is no mentioning of how teachers are expected to conduct fieldwork within these teaching units. In reality, if there is any fieldwork to take place, teachers will normally conduct it once only in S4 focusing on either physical landforms and rocks, or rivers or coast of which many of them belong to the Cook's Tour type of fieldwork (Kent *et al.*, 1997; Lai, 1999). Teachers are less willing to do fieldwork in S5 because of the pressure of the public examination. Besides, they often complain the insufficient time allocated to the teaching of the S4-5 syllabus that they have to conduct extra lessons after school hours and in holidays in order to cover the whole syllabus. Under the tight teaching schedule, it is even less likely for the Hong Kong geography teachers to actually conduct fieldwork with their students despite all the educational benefits and significance that students are supposed to get from it. The situation may get even worse if the 160 geography lessons are to be further reduced in the forthcoming revised S4-5 syllabus, which will be implemented in 2001. This will draw even less willingness from the teachers to take

care of fieldwork because of the perceived 'cramp' syllabus despite its strong advocacy on the study of geographical issues within the immediate environmental context.

7.3.2 1992 ADVANCED LEVEL S6-7 GEOGRAPHY SYLLABUS

1992 is the first year for the Advanced Level Geography curriculum to have a syllabus clearly written down with a significant section to draw teachers' attention of what and how to do fieldwork (CDC, 1992:38-41). I have included below the fieldwork description as prescribed by the Curriculum Development Council. Key words are in bold for emphasis.

> *Fieldwork includes most geographic work conducted* ***outside the classroom****. It can be* ***incorporated*** *into the geography course* ***at the different stages of teaching and learning****, e.g. for introductory purposes, as a part of the development processes and for consolidation purposes at the end of a course. To meet the requirement of the curriculum, students should have no less than* ***five full days of fieldwork experience*** *in the two years of sixth form study.*
>
> *Fieldwork provides good opportunity to* ***study the relationship of man and his environment at first hand.*** *In addition, fieldwork can help* ***develop students' attitudes towards co-operative working and living*** *as well as the proper attitudes towards* ***environmental conservation****. Through fieldwork, students are trained to* ***accept responsibility*** *and to work both individually and collectively within a group.*
>
> *Students participating in fieldwork need to* ***develop a range of skills****, including setting objectives, formulating hypothesis, collecting data, presenting findings, making comparisons, testing ideas and predictions, solving problems and making decisions. They are also expected to* ***perform more sophisticated tasks*** *such as testing models and theories with field evidence and to* ***develop inquiry mind*** *and environmental awareness. This includes* ***a critical appreciation*** *of the ways of maintaining and improving the natural and cultural environments, and readiness to contribute to the planned, rational and balanced use of the environment. At the sixth form level, fieldwork should* ***be student-centred.*** *The role of the teacher is to help students to organize their work by providing* ***clear pre-trip briefing*** *and students are as far as possible encouraged to work on their own in the field.*
>
> *Careful preparation before conducting the fieldwork* ***and suitable follow-up activities*** *in the classroom are essential for a successful fieldwork.*

One can get almost all of educational benefits of doing fieldwork included in this paragraph of fieldwork description. But on top of that, I would like to draw the reader's attention to the clear specification on a number of things, which refer to:

- the time input devoted to the fieldwork in the two years of study;
- the way that fieldwork is organized at different stages of the learning course (i.e. as an introductory or developmental or concluding activity to the programme of study);
- the three aspects of geographical learning in knowledge, skills and attitudes;

- the degree of student active participation;
- the role of the teacher as facilitator and organizer, and last but not the least;
- the importance of briefing and debriefing exercises.

7.3.3 1998 JUNIOR S1-3 GEOGRAPHY SYLLABUS

Similar to the advanced level syllabus, there is a clear section on how to handle fieldwork specified in the "guideline on teaching" of the S1-3 syllabus (CDC, 1998:53-54). I have again included below the key description of the importance of fieldwork and how it should be handled in the junior syllabus for the readers to make comparison. However, I will only highlight those characteristic wordings in bold that they do not yet appear in the advanced level syllabus.

> *As Geography is basically concerned with the study of people-environment relationship, students should be encouraged to apply the knowledge gained during lessons to what they experience outside the classroom. Fieldwork therefore plays an important role in* ***making Geography real and enjoyable****. It is desirable to* ***incorporate it into the yearly scheme of work*** *and* ***involve all Geography teachers****. Every student should have some fieldwork experience throughout the school life and junior secondary students should be of no exception.*
>
> *Fieldwork should not be limited only to* ***excursions to remote countryside****. It can be in* ***the context of the school building and school site*** *and be made on a small scale in this* ***safe, easily accessible and inexpensive setting****. It can be planning and following a route from one's classroom to other parts of the school or simple surveying for drawing a school plan according to scale. It can also be a mini-scale orienteering taking place in the playground and lower floors of the school building, to name but a few. Teachers should also* ***recognise the potential of school picnic*** *for fieldwork. It is true that picnic site may not be a suitable fieldwork site for a particular topic or for a particular form of students. Nonetheless, what is important is to provide an opportunity for students to apply the skills, if knowledge is not possible, they have learned. Another alternative can be* ***coach tour****, making use of school bus services during weekend or school holidays. A few suitable fieldwork sites accessible by school bus can be selected and with careful planning, a number of* ***small-scale fieldwork activities*** *can be introduced to some forty to fifty students within half a day.*

Here in this most updated version of junior S1-3 syllabus, geography teachers are reminded of the following when they consider doing fieldwork with the junior students to:

- make it fun and enjoyable,
- incorporate it into the whole year teaching programme,
- use the local and immediate environment,
- give concerns to matters related to time and safety factors,
- combine fieldwork and school picnic together, and
- reconsider the idea of coach tour, which apparently emphasizes on mere observation.

We can see that as time goes by, the mentioning of fieldwork in the different syllabus becomes more detail and explicit. Not like the 1984 S4-5 syllabus that only topics where fieldwork could be conducted were mentioned. There were virtually no other things about fieldwork being mentioned to brief the teachers on what to do and how to do it. Hence we had the situation of avoidance rather than implementation of fieldwork. However, it is expected in the upcoming newly revised S4-5 syllabus (to be implemented in 2001) that there will be detail description of how teachers should address fieldwork and how can that be carried out despite the teaching hours may further be reduced.

7.4 The Common practice of fieldwork in Hong Kong

Though the three syllabi emphasize much on interconnectedness of issues related to people-land interaction, teachers in Hong Kong at the moment still spend most of their time and effort to cover the syllabus unit by unit, and topic by topic. There is little genuine change to see the teachers to relate the topics within a unit and then between units to form a holistic integral study (Kwan, 1989). At such, if there is any fieldwork to take place in the various syllabi, it is normally chosen to be conducted with one of the many units within the syllabus, of which rocks and landforms are two of the common units. The field trip is arranged as an add-on exercise when the teacher has completed teaching of the unit. The purpose of such fieldtrip is to take the students out of the classroom to confirm what they have just learned in the textbook. Most of the time, it was conducted as a form of 'out-of-classroom' teaching where the students engaged most often in passive listening and observation as originally perceived by Lonergan and Andreson (1988). Even if fieldwork was to carry out, it was the typical Cook's tour and sight seeing type of activity. Very seldom will we find teachers engage students in active fieldwork tasks where 'planned discovery' learning is to take place in the introductory or developmental phases of the geographical unit as advocated by Boud and Feletti (1991).

Although the clarity of doing fieldwork has improved in 1992 and 1998, studies conducted by Lai (1996 and 1999) still reveals obvious discrepancy between intention and practice of fieldwork conducted in HK schools. There is gap between the syllabus intention with actual fieldwork practice in schools. The conceptions of fieldwork between teachers and the students are different. While teachers agree with most of the educational aims and objectives of doing fieldwork, students commonly find the experience of fieldwork not stimulating. There is the impression that teachers are obliged to organize fieldwork because it is specified in the syllabus. So when it comes to the actual fieldwork, there is often no clear brief given to students as where they are supposed to go, what they are supposed to do on site, how they are going to do a subsequent report. this is not to mention that there is no explicit linkage of the fieldwork to the syllabus that they have just covered. Most often, there are virtually no follow-up discussion or debriefing to take place. As a result, students may feel the initial excitement of getting out of the classroom but such an excitement is often suppressed by the tough demand on their physical fitness to walk up or down hill on rugged steep terrain under strong sun and so on. Moreover, the predominant 'look and see' type of fieldwork reduces the students to remain very passive with unmotivated participation and they all engage in trifling activities (Lidstone, 1988).

Despite the 'look and see' type of Cook's tour fieldwork being the most commonly organized by most of the geography teachers in the Hong Kong schools, there are luckily still a minority group of teachers who are devoted to conduct fieldwork at a higher level of educational expectation. They design and carry out task-based fieldwork, which brings about integrated on-site learning and discovery of geographical knowledge and practice of various geographical and social skills. I was very happy to see that one of my in-service geography teachers who did the Postgraduate Certificate Education programme with me this year, submitted a piece of his fieldwork teaching which was conducted with a group of academic slow achieving S1 students. He broke the tradition by conducting a piece of fieldwork on the finding out the environmental quality of the local community (where the majority of his students live) at the beginning of teaching the urban study unit. He set tasks for students to work on by sending them out to various field stations in the school district area. The students were required to observe, interview, identify and make decision on a number of questions related to the environmental quality. A clear briefing section was conducted to explain to the students that the data they were to collect would be of crucial importance for them to carry on with their subsequent lessons. This gave a good responsibility to the students to handle the tasks and data carefully and seriously. Upon returning to the classroom, data from different groups were collated and the teacher guided the students in a very constructive discussion on assessing the environmental quality and considering the possible causes which led to these levels. The students were basically on their own and work as a group to complete the various tasks with the teacher taking on an observing facilitator role in this out-of-classroom activity. The students, attending to this kind of task-based activity, appeared to be more active, more responsive and more articulate in going through the process of learning this unit of urban study, both in the field and in the classroom.

Unfortunately, there is no systematic research yet to have done so far in Hong Kong on how teachers in the different levels actually conduct fieldwork and organize learning activities for the students. The latest doctoral study by Lai (1999) was the first on of the kind to follow closely teachers in five schools on how S4 fieldwork was organized and conducted and what experiences the students have had on participating in the fieldwork activity. The result reveals the same conservative type of fieldwork, as describe in the early part of this section, are still the mainstream to be done by the Hong Kong geography teachers despite the very explicit prescription of fieldwork in the latest versions of the syllabi.

7.5 What causes the discrepancy between intention and practice?

Lai (1996) has revealed the obvious discrepancy between intention and practice of fieldwork conducted in many Hong Kong schools, an incongruity which I have attempted to describe generally in the above section. Given that the educational significance of fieldwork in geography teaching has been recognised globally, what are the actual obstacles which hinder fieldwork from achieving its goals? In this section, I will try to give an account for such discordance from the teachers' perspective.

Despite the educational significance of doing fieldwork, teachers apparently are more concerned about logistic and safety issues. This can be seen clearly in terms of the amount of time teachers will spend on this issue. Instead of putting aside a lesson to

brief the students where to go, when to go, what to do and how to do the fieldwork, and more importantly, its relevance to different parts of the geography syllabus, teachers will choose to spend time informing students on the logistic such as time and venue of meeting, things to carry which include suitable clothing, water and money, and also the safety aspect of not wandering away from the group. Teachers are more concerned of this last aspect because they are accountable to the safe return of the students. This is particularly the case when a tragic hill fire in early 1996 happened to a group of students and teachers leading to a death toll of two teachers and two students. All educational and social parties became very cautious about the liability of participating in this kind of so-called "high-risk" activity. Despite schools have insurance covering both students and teachers in outdoor activities, one may wonder such insurance cover could extend to include accidents caused by teachers who do not have the appropriate or relevant qualification or experience for conducting field studies, such as first-aid or outward bound training or fighting the sweeping bush fire etc. Immediately after the hill fire tragedy, the Advisory Inspectorate of the Education Department of Hong Kong (1996:40) recommended a ratio of one staff member to a group of 30 students. However, the point of concern here is that schools usually do not have sufficient number of teachers to take part in the fieldwork activities. It is unrealistic to ask for any number of suitable and appropriate "experts" to accompany the huge group size of around one hundred students to do any outing activity. It is because of this worry that teachers either avoid to do fieldwork or even if they do so, they will spend much time on briefing the students to behave properly in the field. Even more so, they do not dare to allow the students to work by themselves in the open to complete meaningful and challenging tasks to enable geographical comprehension. Instead the teachers opt for the whole class Cook's tour type of field teaching and observation where they can extend control over the students' movement.

Another major area of teachers' concern is the overloaded syllabus, which does not allow them to spend 'extravagant' hours to bring their students out to experience 'first-hand' geographical learning through fieldwork. They believe they should first address the coverage of geographical knowledge and concepts as prescribed in the syllabus from the textbook within the classroom setting. Only if there is additional time then they may consider taking their students out to 'see' the real things in the open environment at the end of the school year. As a result, they consider fieldwork very important but they don't spend time to really develop fieldwork tasks as made explicit now in the recent syllabus. Instead, they keep using the conservative low order materials that they have developed for years (field data from Lai, 1999). Even the teachers themselves may lose the momentum to organize a meaningful and purposeful fieldwork experience which provides valuable learning experience to the students. This is even more so when both teachers and students know that the questions set in the public examination do not require them to utilize field knowledge and skills, they will simply opt for the easy way to do away with fieldwork. Even if there is the conduct of the minimal type of fieldwork, there is virtually no proper briefing, not to mention the follow up activities given to the students. Students are simply asked to take photographs of a morass of features without a clear reason for doing so. The outcome could be just a display of photographs in the form of a scrapbook with captions and the description of the features directly copied from the textbook.

From the students' perspective as well, fieldwork may not be an attractive idea. Imagine that a whole group of students is required to follow the teacher to engage in a tough outdoor long walking activity just to see a few geographical features which they can also see from the textbook or from the visual aid materials, or also imagine that they have the knowledge that very little of these first hand experiences will be examined, and even if they were examined, they can simply reproduce the hard facts from the book. Would the students have the motivation to learn from and enjoy such fieldwork activity?

Given these perspectives, I have four questions for the teachers to consider when they are planning to do fieldwork:

- Why do teachers always conduct fieldwork after teaching a unit, so that the fieldwork is used as a pedagogical means to conclude or summarize the unit only?
- Why can't teachers consider the holistic integrated field study, that is, to investigate a number of geographical perspectives (human and physical, people-land interaction, environmental relationships) together, so that even a topic or a geographical process is not yet taught to the students, they can still do the fieldwork (Keung, 1986:82) by using fieldwork as a pedagogy for motivation or development to prepare students' interest to learn the topic in the classroom later?
- Why do teachers often give prime focus to the activities that students engage in the field only but ignore the debriefing phase to establish what they have learned in the field and relate such learning back to their classroom syllabus?
- While safety and other logistic arrangement have taken teachers' principal emphasis, have they considered using the school or local community environment to conduct fieldwork which reduce greatly the travelling time so that more time can be devoted to constructive learning activities in the field?

7.6 Future directions

Lai (1996:46), in his seminal study of the conduct of fieldwork in Hong Kong, suggests five ways of changing the direction of research in fieldwork. They are to:

- study fieldwork as a teaching-learning process taking place in an unique learning environment,
- find out the conceptions of fieldwork between teachers and students,
- understand the complex and holistic nature of fieldwork, in particular the social and psychological dimension,
- understand what the students actually have experienced in the field trip as well as what the teachers intended to happen, and
- match the fieldwork intention and practice.

I accord completely with Lai. However, the suggested directions seem to that teachers are doing 'good' fieldwork as intended in the syllabus so that Lai can carry on with the new research directions that he has suggested. The fact has revealed so far is that the practice is falling far behind the intention. The critical issue to address is how can the teachers be motivated to do 'meaningful' and 'good' fieldwork to truly reflect the teaching-learning process, the holistic nature of fieldwork withim the overall syllabus and to bring about more positive and optimistic conceptions of fieldwork between teachers and students.

In the three geography syllabi of Hong Kong, fieldwork is described as essential where local examples can be studied. I have further advocated the conduct of fieldwork in the vicinity of school ground or district area. However, to ease teachers' concern about logistic of time and cost and, more importantly, the safety factor, it will be necessary to establish more government or charity operated field centres where there is greater resource input to facilitate the curriculum intentions of fieldwork. In fact, the necessity of suggesting more field studies has been frequently brought up in the Annual Reports of the Certificate of Education Examination when the educational objectives have not been fully met by the performance of the students in the public examinations (Keung, 1986:79). By September 1996, ten years after Keung's recommendation, the number of field studies centres operated by government and educational charities has increased from one to three to cater for the needs of the advanced level geography teachers and students. The use of fieldwork as a developmental pedagogy is also seen to become more important (Lai, 1996:47) due to the central organization and adequate provision of resources (in terms of number and quality of manpower to lead the students to engage in fieldwork) are made available to the school teachers.

It is hoped that by conducting advanced level of fieldwork through these field centres, teachers of the junior level can adapt and modify from those examples set by the centres to come up with practical fieldwork for the junior forms bearing the following characteristics in mind:

- The *structure* of fieldwork should be integrated within units or stand alone. It should demonstrate links between fieldwork and the main syllabus through careful briefing and debriefing sessions (see McEwen *et al.*, 1996:379).
- The *location* of fieldwork could be both in the school locality a short distance away or in more remote geographical sites a long distance away (see Bland *et al*, 1996:166).
- The *skills* involved are transferable and practical in a living environment within a contextual frame to enable students to see the meaning of such skill in real life sense (see McEwen *et al.*, 1996:379).
- The *assessment* in the form of a formative mini investigative research project could give extrinsic motivation to students' participation (see McEwen *et al.*, 1996:379).
- The *frequency* of doing at least one well organized and integrated fieldwork per year with geography students of all levels by taking into consideration of the above four characteristics.

7.7 Conclusion

Though what has been discussed in this chapter refers to the fieldwork practice in Hong Kong, there are actually many commonalties and similarities that readers can find from the practice of other countries. There is no doubt that the educational fieldwork intention is to encourage further independence and student empowerment in the learning process (McEwin *et al*, 1996:382) via the inquiry issue-based teaching. Such learning approach is to move away from the teacher-initiated and teacher-led to pupil-initiated and pupil-led fieldwork activities. Perhaps the mid point of this continuum is the first target for the geography teachers to work towards to, i.e. jointly initiated and eventually pupil-led

(Bland *et al,* 1996) which is similar to the example that I have quoted in Section 4 of this chapter by referring to the meaningful engagement of fieldwork discovery by a group of academic slow achievers.

There is also the need to rethink the range of different fieldwork experiences in terms of learning outcomes to engender 'deep' rather than 'surface' learning across a range of student abilities through paying attention to individual learning and also in the form of peer group coaching or instruction (McEwin *et al.*, 1996:382)

Finally, it is important for geography teachers to strengthen the impact of "fieldwork" in Hong Kong geography teaching by seeing it as both an opportunity and a challenge. There is the opportunity to reflect on past practice and experience, to innovate and to reinforce fieldwork as a dynamic learning environment. The challenge is to match finite resources and overcome the various practical constraints (time, cost and safety etc) with maximized quality in fieldwork delivery.

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SECTION 4
PEDAGOGIC ASPECTS

8. LEARNING IN THE FIELD: AN EXPERIENCE FOR TEACHERS AND STUDENTS ALIKE

JOHN LIDSTONE

8.1 Introduction

Geographical fieldwork is an essential part of our subject. Few readers will argue with that statement. However, when we look deep within ourselves, and acknowledge the ever increasing pressure under which many of us are working, do we ever question the costs of such activities on our personal and professional lives? It may seem almost heretical to ask this question, but I believe that if we do not, we may never understand the real reasons why, despite brave rhetoric, the practice of field study in geography is frequently less inspiring.

Geographers have long regarded fieldwork as being central to their teaching and research and as something intrinsic to the very nature of being a geographer, that is, a member of the community of geographers. In 1986, Stoddart restated the central concerns of geographers as: with earth's diversity, with the use of maps and with fieldwork. He also acclaimed these as fundamental to the subject at the elementary as well as the research level.

More recently, Abler, Marcus and Olson (1992) in a book called *Geography's Inner Worlds* suggested that geographers are prone to overlook how much they share emotionally and intellectually with other geographers and reminded us of that most typically geographic exercise - a field trip. They said: "Regardless of specialty, nothing reminds geographers of how much they share - and how much geographers differ from colleagues in other disciplines - than a multidisciplinary transect through almost any landscape in the world. Historians, sociologists, and political scientists will cluster in the back of the bus where they will chat in a desultory manner or sleep. Geologists may be roused into observational action by road cuts but will see little between them. Meteorologists will be helpless without their computers and models. Only the geographers – again, regardless of specialty - will incessantly rubberneck, gawk, point, explain, speculate, and argue about what they are seeing, more or less without regard to whether it is urban or rural, physical or anthropogenic, beautiful or hideous. In real places, much of what seems to separate geographers evaporates, and what unites them becomes vividly obvious" (p. 2).

For most of this century, curriculum developers in various parts of the world have included fieldwork in their school syllabuses as an important teaching strategy or skill. Departments of Education have published special handbooks on organizing and conducting fieldwork. Examination boards have specified that students' ability to apply

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 133-143.

fieldwork experience may be tested in public examination papers. In some countries, field studies centres have been established to organize field study courses for teachers and students. Wherever geographical fieldwork is conducted, however, it seems to be the one aspect of geography that is most memorable and which binds participants together.

When we think back over our school days and time spent at university, it is very probable that some of the most vivid memories are associated with times spent out of the educational buildings themselves on what might have been called excursions, visits, outings or field trips. The memories may be of pleasure, pain or of new understandings achieved, but whatever form the memories take, few outings are ever forgotten. Indeed, many teachers are aware that such visits play a major role in students' decisions to continue their studies in geography and other subjects with an out-of-school component.

8.2 Origins of "Learning in the field"

Learning in the Field has a long and eminent history in the annals of education. Aristotle advocated that education should be continued after school through travel. In 18th century Europe, the Grand Tour was an indispensable part of the education of every young man of status, while in the 19th Century, gender equity was addressed by the institution of Finishing Schools (often in Switzerland or France) for young ladies of quality. Today, it continues in Australia (and elsewhere) in a somewhat modified form as the Great Overseas Experience (the OE) engaged in by many young people in their twenties.

In the present century, the excursions which formed part of the university education of many students, and which are now undertaken across the whole educational spectrum, have become known as field trips. The term "trip" sometimes appears to give the activity a carnival aspect, or at least the notion of a picnic, an idea that may well have originated in the institution of excursions by the 19th century railway companies of Europe in order to increase revenue, and which continues to the present day whereever theme parks establish education offices to encourage the booming school's market. Today, we may prefer to refer to such visits as "field studies" in order to avoid allegations of "time out from learning". Whatever their origins, field trips have become part of the education of most students in primary and secondary schools, as well as moving down to kindergarten and being maintained as an essential part of many university courses.

Hammerman, Hammerman and Hammerman(1985) suggest that field trips gained further impetus as a result of World War II when, in an atmosphere of tension, pressure, frustration and anxiety, schools developed a responsibility to provide the "ingredients that make for emotional stability and well being". Thus from 1930 to 1960, there was a dramatic growth in school camping, camping education and residential outdoor education of all kinds, including a major emphasis especially in the United Kingdom on geographical education in the field.

Linked to this, in the United States of America, were the effects of the droughts of 1934 and 1936 which led not only to the loss of 50 million hectares of formerly productive farmland, but also to a perceived need for conservation education.

8.3 How can Field Trips be defined?

Types of fieldwork may vary, but their underlying educational principles and practices have much in common. First, fieldwork attempts to combine academic inquiry with out-of-school activities. It is usually viewed as an integral part of the curriculum or an adjunct to classroom learning. The intention is to integrate theory and practice in a particular subject area, to encourage students to develop their skills, and to facilitate learning by doing.

Secondly, fieldwork focuses on type of experience. The essence is the direct and first-hand experience of phenomena and processes versus the indirect and second-hand experience of the classroom and library. Fieldwork experience is deemed to enable direct contact with, perception of, or interaction with objects or phenomena not accessible in other settings. "The field enables objects, events and processes to be experienced in their natural setting" (Lonergan and Andresen, 1988, p. 67).

Some educators such as Daugherty (1989) have stressed the novelty and diversity of the fieldwork experience. Others such as Stimpson (1995) have emphasized the meaningful personal experiences fieldwork brings to students. It is argued that abstract concepts come alive and have meaning through concrete experiences, and personal experience heightens awareness and deepens understanding of places, distinctive ideas and concepts. For instance, the 1990 manifestation of the national geography curriculum of England states:

> *Geography is fortunate in that places may be experienced at first hand. A significant emphasis of fieldwork is often on developing 'a sense of place' in pupils, an elusive holy grail in much geographical work.* (Department of Education and Science, 1990: 85)

Defining the essential nature of field studies or field trips is very hard in view of the range of experiences and the range of justifications offered. Justifications frequently include reference to bridging the gap between the classroom and the "real" world, to the world beyond the classroom as a valuable educational resource and to giving students "real" experiences. In view of the wide range of activities that can be included, Hearder (1995) adopted the term "Out of class experience" to represent all such activities. Other definitions that have been culled from the literature include:

- Those occasions when: "... the students are put into buses early in the morning, driven to a rather novel setting, led through some activities by a stranger, put back on the bus, and returned at the end of the day." (Falk and Balling, 1982:22)

- "A trip arranged by the school and undertaken for educational purposes in which students go places where the materials of instruction may be observed and studied in their functional setting; for example, a trip to a factory, a city

waterworks, a library, a museum, etc. Syn. instructional trip, school excursion, school journey." (Krepel and DuVall (1981: 8)

- There are two types of field trips: "those simply meant to "expose the children to new experiences and those with a deliberate pedagogical purpose" (Pinero, 1985: 14)

- "... any journey taken under the auspices of the school for educational purposes". (Prather, 1986:4)

- "... a visit to a place outside the regular classroom designed to achieve certain objectives that cannot be achieved as well by other means." (Muse et al., 1982:122)

- Zielinski (1987) divides out of class experiences into four levels:
  1 Activities taking place within the school building
  2. Activities taking place within walking distance of the school (including the school grounds);
  3. The one-day trip where students leave the school grounds for a significant part of or a whole day; and
  4. The multi-day trip such as the school camp.

- " ... a vehicle that enables teachers to bridge the gap between the classroom and the real world, as a resource available to the teacher" (Krepel and DuVall (1981: 8).

The U. K. Geographical Association Sixth Form - University Working Group (1984) provided another useful perspective by categorizing the purposes of fieldwork at senior secondary school into three strands:

1. subject-specific purposes: helping the students to gain a greater understanding of the discipline of geography, including grasping of the vocabulary, development of field investigation techniques and an ability to relate the ideal world, map and textbook examples, to the real world which they encounter in the field;
2. student-specific purposes: as a vehicle for the development of interpersonal relationships, in particular between student and student and student and staff, thus helping the development of human capacity skills such as confidence; consideration; co-operation and flexibility, and
3. student-environment purposes: to develop understanding of people-environment interactions and to develop a consistent value stance on matters relating to the environment.

The Working Group saw these three purposes as inter-related and mutually reinforcing. It believed that the first two strands contribute to the achievement of the third strand of purposes which was relevant to a contemporary humanistic framework for geography.

Kent et al. (1997) provided their summaries of objectives of fieldwork as expressed in the literature under three categories: subject-specific objectives, transferable/enterprise

skills and socialisation and personal development. Their focus is on the integration of skills with fieldwork within higher education – these include group work skills, leadership skills, communication and presentation skills. The last category was considered as the 'hidden agenda' of fieldwork, which included enhancement of staff-student relations, stimulation and enhancement of enthusiasm for study and development of a respect for the environment. However, while hardly to be considered an agenda item of field work, there is a noticaeable absence of reference in much of the literature on field work over the past quarter century of the perceptions of teachers and the perceived effects of field work on their personal and professional lives. Among the first people to identify this as a problem within the whole educational context were Orion and Hofstein (1991), although it is acknowledged that others elsewhere had earlier drawn attention to the potential legal and other pitfalls in articles with titles such as "Educators, Field trips and liabilities" (Mauldin and Ashton, 1981) and "Field Trips: The Facts of Strife" (Walraven, 1980). Orion believes that it is not worth taking students on out-of-class experiences, considering the time, cost and associated administrative procedures, if the students are then limited to achieving similar outcomes to those achieved in the classroom.

Orion and Hofstein (1991) classified the categories and factors by which define out-of-class educational experiences can be identified as follows:

Teaching factors	Trail/Site factors	Student factors
1. Place of out-of-class experience in curriculum structure	1. Quality of learning conditions at each station	1. Previous knowledge of the topic
2. Teaching/learning methods	2. Duration of experience	2. Previous acquaintance with area
3. Teaching and learning aids	3. Attractiveness of setting	3. Previous out of class experiences
4. Quality of teacher	4. Weather conditions during the experience	4. Previous attitudes to subject
		5. Previous attitudes to out of class experiences
		6. Class composition
		7. Class size

Figure 1. The categories and factors which define the out-of-class educational system (after Orion and Hofstein, 1991)

However, despite their earlier acknowledgment of the potential costs and problems in arranging out-of-class experiences for students, Orion and Hofstein failed to include such factors under the heading of teaching, presumably on the grounds that once the decision to undertake the experience has been made, then they cease to be relevant to the success or otherwise of the trip. However, this is unlikely to be the case. The conceptions of field trips carried by teachers are likely to permeate their whole attitude to the experience, and to reflect strongly on the activity as experienced by the students.

This contention is not new. One of the major reasons given by teachers as to why they do not take their students out of the classroom is time (Onion, 1991). The time taken to prepare for an out-of-class experience (Knapp, 1986) can be considerable and teachers may decide that this time would be better spent elsewhere. Another way in which time is regarded as a hindrance to the conducting of out-of-class experience is the length of the blocks of time available to the teacher. If a single lesson is considered too short a period of time (for example 30 minutes) in which to conduct worthwhile activities or to travel to other locations, then teachers will remain inside the bounds of the classroom walls (Fido and Gayford, 1982 and Knapp, 1986). This factor seems to weigh more heavily in the minds of secondary teachers as their time is still frequently divided into lessons of around 30 to 40 minutes (Muse et al., 1982). As some activities requiring students to leave their regular classroom, such as collecting samples at the local creek, mapping part of the school grounds or visiting the local museum take longer than the average lesson, especially if you need to add travel time, the perceived opportunity to conduct out-of-class experiences becomes rare.

The emphasis placed on out-of-class experiences in examination syllabuses and other curriculum documents are also factors that have been noted frequently as influencing factors. If out-of-class experiences do not receive a significant mention or coverage in examinations and syllabuses then teachers tend to concentrate on those aspects of teaching which do have a higher emphasis placed on them. In the planning stages a number of factors will influence whether or not to organize an experience. If considering an out-of-class experience and there is no suitable site available, or maybe a lack of transport or equipment available in the school, teachers will remain in the classroom. Sex of the class involved, parent pressure, insufficient funds, and lack of curriculum materials all add to the long list of reasons teachers remain indoors, in their regular classroom.

The system in which the teachers are working may exert pressure that discourages them from organizing out-of-class experiences. A shift towards "basics" education has been named as one such discouragement (Keown, 1984) as well as the "court shy" tendencies of administrations (Keown, 1984 and Knapp, 1986). The possibility of liability claims against schools is frequently a concern especially in the light of a subtle change in the definition of teachers' responsibilities towards their students from "in loco parentis" to "duty of care".

Student behaviour is considered significant (Fido and Gayford, 1982 and Muse et al., 1982) with teachers feeling as if they have lost control over what is being learned and finding it difficult to focus students on the required task. One teacher in the United States cited by Muse et al. as long ago as 1982 stated that "junior high kids are too squirrelly to take on a field trip".

8.4 Out-of-Class experiences from the teachers' perspective

Hearder (1995) undertook a study of teachers' conceptions of out-of-class experiences using the research approach called phenomenography. She argued that conceptions are determined by our experiences (either direct or indirect) and on the basis of extended

interviews with a group of geography and biology teachers, she revealed six main conceptions held by teachers.

- An out of class experience is seen as an educational activity beyond the regular classroom.
- An out of class experience is seen as an adjunct to learning (but not essential).
- An out of class experience is seen as an essential educational component.
- An out of class experience is seen as a discipline risk.
- An out of class experience is seen as an administrative exercise.
- An out of class experience is seen as a type of teaching/learning experience.

Hearder was able to discern a clear distinction between teachers' conceptions which reflected an emphasis on out-of-class experiences as student-centred and those in which the teachers' interests and concerns were to the fore. This division and the way in which Hearder constructed the relationship between the various conceptions are illustrated in Figure 2.

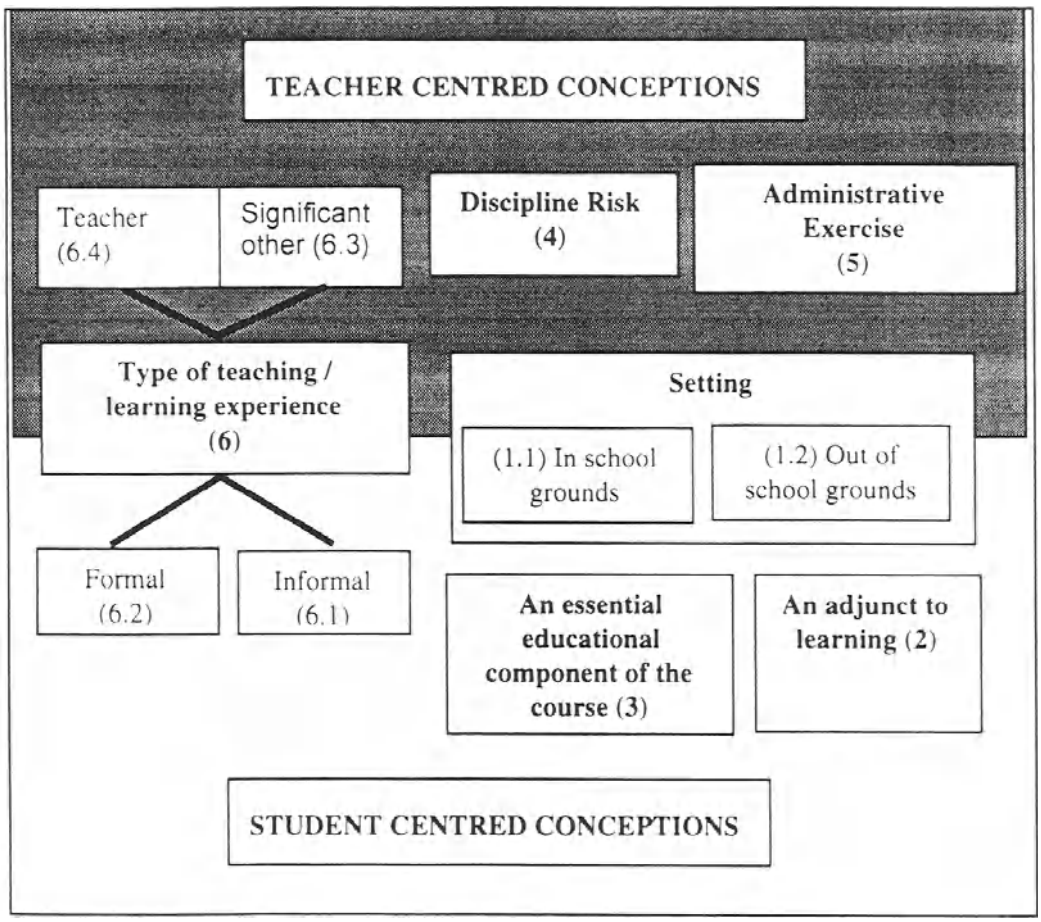

Figure 2. The Outcome space showing the structural links between the varying conceptions of the out-of-class experience held by secondary school teachers (after Hearder, 1995).

8.4.1 AN OUT OF CLASS EXPERIENCE IS SEEN AS AN EDUCATIONAL ACTIVITY BEYOND THE REGULAR CLASSROOM

The setting of the activity was the obvious starting point for many of the teachers in Hearder's study, all of whom came from the Australian state of Queensland. However, in discussing the setting of their work, they drew clear distinctions between activities which took place outside the classroom but within the school grounds and those which involved going beyond the confines of the school. For some teachers, the associations of out-of-class activities with going away from the school premises were so strong that they rephrased the question to exclude on-campus activities. When asked why this clear distinction was made, reference was frequently made to the "potential problems" (often ill defined) of going off campus, although for teachers in more modern Queensland schools, which are usually designed as separate single storey blocks in a park-like setting with classrooms linked by open covered walkways, having students working outside the room is probably quite normal regardless of the activity being undertaken. Despite this caveat, and given that outdoor activity is quite normal in the Queensland context, the fact that teachers have an immediate response to out-of-class activities suggests that they do not regard this form of teaching and learning as qualitatively similar to their classroom-based activities.

8.4.2 AN OUT OF CLASS EXPERIENCE IS SEEN AS AN ADJUNCT TO LEARNING

Teachers in Hearder's study who promoted this conception regarded out-of-class experiences as valuable in that they provide students with experience of the various concepts being taught. However, despite this, they regarded them as being an "extra', outside the essential learnings that take place in the classroom. The implication was the while one may expose students to various experiences, they will still need to teach the content in class, and this can quickly lead to the suggestion that time away from the classroom is a sacrifice of valuble teaching time. One of Hearder's teachers commented: "Sometimes there are so many interruptions that I cannot tolerate any more. We will simply stay in the school".

8.4.3 AN OUT OF CLASS EXPERIENCE IS SEEN AS AN ESSENTIAL EDUCATIONAL ACTIVITY

In contrast to the conception of out-of-class activities as being merely adjunct to the real work of the classroom, this conception represents a view that one simply cannot teach adequately without the use of out-of-class activities. Without such activities, the student's education is incomplete. This conception reflects the views promoted in many teachers' guides and curriculum documents which refer to field study and promotes the twin views that practical work is, firstly, integral to learning in the subject, and secondly, that all learning in the subject is better achieved when teaching incorporates work both in and outside the classroom. "I believe that when you are teaching geography you should be using the field as much as you possibly can and I just ... am sad that we can't use it more than we do. I would definitely prefer the hard work and take them out because I feel there is definitely a better result from having taken them into the field" (Hearder, 1995:53).

8.4.4 AN OUT OF CLASS EXPERIENCE IS SEEN AS A DISCIPLINE RISK

While the conceptions of field work that are involved with learning are invariably student centred, the teacher-centred conceptions involve The study revealed a considerable number of conceptions that are inimical to the encouragement of more field work in geography classes, and foremost amongst them is the issue of student control and discipline. The teachers who were interviewed by Hearder felt that they were in a better position to control student behaviour when they are in a classroom and that by leaving the classroom they are relinquishing a considerable part of their power, with the result that students will misbehave. On the other hand, it was admitted that when students leave the school grounds for an officially sanctioned field study, then the administration of the school will regard them as representing the school in the wider community. Should students then misbehave in public, they will be disciplined by senior staff as well as by the responsible teacher. This can reduce the risks of indiscipline. However, one teacher still admitted: "I feel trepidation about whether the kids are going to represent the school properly. That is always uppermost in my mind" (Hearder, 1995: 54). The extreme importance of such conceptions in influencing teachers' attitudes to out-of-class activities is particularly poignently expressed by another teacher who explained: "If I have big troubles with discipline, in my opinion it is not worth doing. Not only because it becomes too stressful for me but because they are not learning anything either. I'm spending my whole time ... 'stop that', 'put that down', 'don't do that', 'where is your pen', 'where is your book'. The good kids aren't getting me telling what is happening ... they're getting me disciplining other class members" (Hearder, 1995:55).

8.4.5 AN OUT OF CLASS EXPERIENCE IS SEEN AS AN ADMINISTRATIVE EXERCISE

The conception of out-of-class experiences as administrative exercises appears to be based on the notion that they invariably take place away from the school premises with all the legal and organisational requirements that are associated with them. "Even a supposedly simple excursion requires a lot of co-ordination. You have to ring up the people involved, you have to set a date, then that has to be approved by the people you are dealing with plus it has to fit in with the school timetable. Then you have to organise buses, you have got toorganise a letter to go home to the parents. You have to organise the child to get those letters back on time which is sometimes a battle. Then you have got to get your time schedule right for all that. You have to notify other teachers, you have to notify the deputy principal ... Oh! It goes on and on. So by the time it happens, you think ... God! I'm worn out!" (Hearder, 1995:56).

8.4.6 AN OUT OF CLASS EXPERIENCE IS SEEN AS A TYPE OF TEACHING/LEARNING EXPERIENCE

This conception of the out of class experience holds that such an experience is qualitatively different from teaching/learning activities that occur inside the classroom. Within this broad differentiation, the differences may also be distinguished in terms of

the formality or informality of the experience and in terms of who offers leadership of the experience.

Conceptions relating to the levels of formality were demonstrated by such teacher comments as:

> *... it [an out of class experience] is most probably any experience which you introduce students to which enables them to be a little more relaxed in their approach. Not as structured as formal and that usually means a little more relaxed*

and

> *Very tightly controlled, in other words, we regulate very tightly what we want them to do, their procedures ... they always have a structured field type situation. So we still tightly structure their learning experiences and they work their way through that* (Hearder, 1995:57-8).

Thus, while one sub-conception regards out-of-class experiences as being more formal than normal classroom activities, the other regards them as less formal and an opportunity for some relaxation. Such different conceptions must obviously have a considerable effect on the ways in which teachers approach the task or responsibility of integrating field work in their curricula, and further will have great influence on the types of field work activities that are attempted.

The second group of sub-conceptions associated with out of class experiences as different from those in classrooms, is concerned with who provides intellectual leadership to the students. While some teachers regard visits as an opportunity for students to encounter "experts in the field" (pun intended) others regard them as a chance to demonstrate in practical terms aspects that they have already covered in the classroom. This sub-conception is revealed by such varied teacher comments as:

> *... I think it is great to be able to say 'Look at this' and 'Look at that' and know that I am getting them to look*

and

> *When we go ... in our urban studies, well, instread of having an urban geographer talking to the kids, we actually have the town planner talking to the kids. Or if we are doing ... we are going to, say, forestry ... we have the foresters talking, when we go to the sawmills, we have the millers give their point of view* (Hearder, 1995:58).

8.5 Conclusion

As noted above, much of the comment on field work in geographical education books and journals and elsewhere in the past has concentrated on methods of enhancing the learning experiences of students and the various objectives with which field work has been approached. Hearder's research, reminds us forcibly that the conceptions of field work held most strongly by teachers will affect not only their willingness to incorporate out of class experiences in their curriculum planning but the approaches to field work they choose to implement.

Any teacher who contemplates organising field work for his or her students is faced with negotiating not only with the students concerned but also with parents, school administrators, district or regional education administrators, and other teachers. This list does not begin to consider the other range of people who may be involved in the visit itself who may range from bus operators to guides. In our attempts to encourage greater involvement in field work, it behoves us to remember that teachers may well be convinced of the educational benefits of such activities, but baulk at the practical or disciplinary problems which look large in their conception. For other teachers, who may have learned from their experiences of recent years that teaching has become ever more bureaucratised, the task may be conceived purely in terms of organisational efficiency, with less attention paid to the potential educational benefits. Providing extra encouragement or training for the former group in pedagogical practice or for the latter in organisational management is unlikely to be effective. Rather, we should focus on, and show respect for, the whole teaching enterprise as engaged in the facilitation of learning. Pedagogy is becoming an ever more complex activity, and we fail to respect the totality of teachers' experiences and conceptions of their role at our peril.

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9. AFFECTIVE-FOCUSED GEOGRAPHICAL FIELDWORK:

What do Adventurous Experiences during Field Trips mean to Pupils?

KWOK CHAN LAI

9.1 Negligence of Affective Learning and Experience in Fieldwork

Field educators often justify fieldwork by appeal to multiple purposes, and an analysis of its aims is characterized by the diversity of explicit and implicit educational goals. Apart from helping students consolidate and apply classroom learning and acquire practical skills, it also contributes to affective goals such as development of environmental attitudes and personal and social development (see for example, Carneiro, 1988; Foskett, 1997; GA Sixth Form - University Working Group, 1984; Kent, Gilbertson, and Hunt, 1997; Laws, 1989; Lonergan and Andresen, 1988).

Fieldwork is often associated with greater learner participation and interaction (Leal Filho, 1993; The Scottish Office Education Department, 1993). There is also the belief that fieldwork improves "understanding and relationship between students and between teachers and students" (McRae, 1990, p. 9). It is also asserted that "field studies stimulate a positive sense of moral and social behaviour" and hence contribute towards citizenship education (Leal Filho, 1993, p. 89).

Environmental educators believe that learning *in* or *from* the environment in fieldwork not only contributes to students' acquisition of knowledge and refinement of skills (Palmer, 1998), but also develops environmental awareness in students (Clary, 1996), increases their sensitivity to environments and leads to the building of a personal environmental ethic (Job, 1996, p. 32).

However, amidst these claims of affective outcomes, some educators queried the performance of formal school subjects like geography in enhancement of peoples' environmental attitudes. For instance, Akhurst (1993), an outdoor educator, commented that:

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 145-169.

> *Formal education concerning the natural world does little to directly enhance people's ability to express their affective attitude towards this environment. Geography teaches us about glaciation, rock formation, farming practice; biology tells us of plant and animal life, etc, neither makes us more aware of the reasons for our appreciation (or otherwise) of the environments upon which these disciplines focus.* (p. 24)

Hawkins (1987) also reminded us that in many fieldwork teachers were pre-occupied with students' acquisition of a body of pre-determined knowledge, and neglect their perceptions and the process of learning in the environment. As such, the impact of field experiences on the individual is limited and young people will remain alienated from the environment.

The concerns of Hawkins were confirmed by various studies which suggested that geography teachers were mainly occupied with the knowledge and practical aspects of fieldwork and neglected affective learning. For instance, McPartland and Harvey (1987) demonstrated that the subject-specific purposes of fieldwork remained prevalent in the sixth form, indicating that the use of fieldwork for social purposes or environmental education was not regarded as important. Harvey (1991) in his study of the residential fieldwork experience of Advanced Level students, similarly observed that there was an overemphasis on conceptual understanding and a negligence of affective learning and experience. Similarly, Williams (1997) concluded in her studies of Advanced Level residential fieldwork that the field trip had little or no impact on the students' attitude toward the environment.

Other studies also suggest that teachers were less concerned with emotions and feelings which had affected the students' learning and their willingness to participate in further field trips (Orion and Hofstein, 1994). For example, Lai (1996b), in a study of the fieldwork experiences of student teachers, revealed that the lecturer was mainly pre-occupied with the cognitive and technical aspects of the fieldwork and was not aware that there were emotions and feelings which affected the students' learning. The students resented the field trip as another Institute-imposed assignment of which they had no ownership. Paradoxically, they were highly motivated in organizing field trips which were initiated by themselves.

Some geographical educators have attributed the negligence of affective learning and experiences to the nature of the hypothesis-testing approach which has been prevalent in fieldwork since the 1970s (Harvey, 1991; Rynne, 1998). Despite such an approach being often acclaimed as equivalent to "scientific explanation" or "enquiry learning", often the investigations were in practice based upon tightly drawn-up hypotheses with pre-determined results (Job, 1996; Lidstone, 1988; Pocock, 1983). This approach was also seen as providing limited opportunities for students to develop a sense of place and

express their feelings about places and events during fieldwork. Students were not encouraged to have environmental exploration, personal reflection and discovery (Pocock, 1983). Bradbeer (1996) summarized criticisms of the approach as:

> *For many students fieldwork has come to mean data collection and its chief function is to generate unproblematic data from the 'real world' which can be used to test generalised hypotheses and to apply hard-learned skills of statistical analysis. The actual field location becomes almost an irrelevance. Issues of contextuality, self-reflection, critical thinking and problem formulation have been marginalised and concern for a sense of place and for landscape as a whole are only incidentally, if ever, encouraged.* (p. 12)

In addition, these educators are concerned that students tend to experience hypothesis-testing fieldwork "purely as a scientific investigation from which they remained emotionally detached" (Job, 1996, p. 43). Feelings, emotions, sensations and opinion were negated, as only quantifiable forms of evidence were considered valid. Moreover, the quantitative approach often did little initially to provoke a critical appraisal of what was being studied.

Sharing the above concerns, an increasing number of geographical educators have argued for the need to attend to both the cognitive and the affective aspects of fieldwork in geographical and environmental education. Smith (1987) one of the early proponents, cautions that geography teachers often under-value what they do in geography teaching, and they are not aware of fieldwork's potential value in learning when it is done well and in a heuristic fashion. He argues that the purpose of geographical education is much more than academic inquiry:

> *We should not be too modest to explain the benefits of a geographical education, to show how they may contribute to other dimensions of education which we believe are worthwhile, and which may be the long-lasting agencies of personal and social development.* (p. 214)

Harvey (1991) asserts that there was a need to strike a greater balance "between attention to conceptual understanding and consideration of the neglected area of affective learning and experience" (Job, 1996, p. 44). Others ask geographical educators to adopt "an approach to education which consciously bring together the cognitive and affective - understanding and feeling, so that the two interact and refine each other" (Rynne, 1998, p. 211; see also Slater, 1996).

9.2 Outdoor Education

Both geographical fieldwork and outdoor education emphasize learning through direct and first-hand experience in out-of-classroom settings. However, a review of geographical education literature has revealed that there have been surprisingly few attempts to study how geographical fieldwork can benefit from the experiences of outdoor education.

Gair (1997) defines outdoor education as "an approach or a methodology by which challenging activities and the natural environment provide an arena for the personal, social and educational development of young people" (p. 2). This traditional emphasis on personal and social education of pupils through risk taking, physical challenges and residential experiences is what perhaps differentiates outdoor education most from geographical fieldwork. This difference in focus is largely a result of their different traditions.

In the United States, Knapp (1990) considered that contemporary outdoor-environmental education could be traced back to several related movements in the later 19th century and the first half of the 20th century: organized camping, nature-study and conservation education. In Britain, Smith (1987) similarly differentiated the development of outdoor education through two strands: environmental education and outdoor pursuits. The former emphasizes learning *in* or *from* the environment to develop environmental awareness of the students (see also Job, 1996). Outdoor educators of the latter, on the other hand, are more concerned with the objectives of "educating students for life-long leisure" and "personal development of the students, i.e., in increasing constructs such as self-reliance, confidence and self-esteem" (McRae, 1990, p. 6). These objectives are generally not emphasized by fieldwork in the traditional school subjects, as the prime purpose of the latter is usually on academic enquiry, not leisure or personal development. Outdoor pursuits, such as hillwalking, canoeing and mountaineering, are also generally not accepted as a valid part of the formal school curriculum (Gair, 1997).

Adventure education is a branch of outdoor education which is often traced to the Outward Bound Movement of Kurt Hahn (Richards, 1992). There are a variety of adventure programs, but they all "involve doing physically active things away from the person's normal environment" (Hattie, Marsh, Neill, and Richards, 1997, p. 44). Physical fitness and physical skills are not the primary goals. The focus of adventure education is on the utilization of risk-taking activities to foster personal growth (Wurdinger, 1997). Its three basic tenets were "using experience to enhance the educational process, building moral character, and developing a willingness to take risks" (ibid., p. xi). The first tenet positions adventure education as a subset of experiential education with its strong emphasis on practice. Building moral character

includes the building of self-esteem (intrapersonal level) and the development or enhancement of social skills (interpersonal level) (Priest, 1990). Taking risks is deemed to help "people learn more about themselves and the world in which they live" (Wurdinger, 1997, p. 4).

The application of the adventure experience, like risk-taking, group work and problem-solving, to other settings is emphasized (Wurdinger, 1997). Facilitation and debriefing sessions are particularly important because they allow the participants to "analyze, interpret, and gain new understandings from the strong emotional experiences they encounter through the challenge activities" (Laabs, 1991, cited by Lewis and Williams, 1994, p. 13). Studies also confirm that "feedback is the most powerful single moderator that improves affective *and* achievement outcomes" (Hattie et al., 1997, p. 75).

For adventure educators, "adventure is not a materialistic experience; rather; it is a spiritual or perhaps a humanistic experience" (Leroy, 1983/1995, p. 451). To Leroy, "adventure, after all bears a fascination and a mystery that make it in definition somewhat inviolable" (ibid., p. 450). Hence the crux of adventure does not lie in its degree of difficulty, but in the subjective psychological experience for the participants. As Leroy (ibid.) explains, "the physical magnitude of the peak, pole, lake, or trail is no more important than the emotional response the task elicits" (p. 446).

Students often perceive that the physical risk associated with outdoor programs, which is deliberately included by adventure educators, as dangerous. Again it is not the objective dangers, but the subjective experience that matters:

> *Even though the danger is really quite slight, the feeling of being subjected to danger is overwhelming and it is the feeling that is important.... the feeling of danger that the experience elicits is, in a sense, a spiritual preparation for self-growth. ... those feelings that lead to students' insistences (that the dangers are great) are filled with growth potential and are actually what we seek. We succeed when what we do is reasonably safe for us but seems horribly dangerous to students.* (ibid., p. 448)

The mental commitment to persist in the adventure and the experience of "subjection to stress, 'understandable stress'" are seen to be highly educative for the participants (ibid., p. 449).

As mentioned above, despite the common emphasis by outdoor education and fieldwork on learning through experience in the outdoors, it is surprising that there have been few studies on how the theories and practice of outdoor education can contribute to the those of geographical fieldwork, and vice versa. Smith (1987), an early proponent, asserts that

geographical and outdoor education have a harmony of purpose. Geographical fieldwork, if conducted in a well-planned and heuristic fashion, also has the potential to provide opportunity for personal and social education through first-hand and authentic experience.

Hawkins (1987) and Smith (1987) also introduced experiential approaches from outdoor and environmental education to geographical fieldwork. They advocated the "earth education" or "acclimatisation" approach of van Matre because it first tries to heighten students' environmental awareness, followed by motivating them to acquire knowledge about the environment and development in them of a sense of personal concern and responsibility. Hence it has the potential to achieve an "elusive balance between learning activities which engage the emotions and the senses on the one hand, and understanding of ecological and geographical principles on the other" (Job, 1996, p. 40). Both writers emphasize the importance of the learning process, apart from the body of knowledge to be learned. Recently, more geographical educators have lent support to what they advocate (for example, Job, 1996; Rynne, 1998).

Studies by this writer (Lai, 1996b; 1998) have revealed the strong emotional experiences student teachers and secondary school students encountered through physical challenges in physical geography field trips. These experiences are potentially highly educative as opportunities to overcome these challenges and perceived risks have been conducive to building up of interpersonal relationships among teachers and students.

In the rest of the chapter, I shall report a qualitative case study of the adventurous experiences of Secondary 4 (Grade 10) students in geography field trips. What is remarkable is that the adventurous experiences were deliberately created by the geography teachers, and not merely as a "by-product" of field trips. I shall also report the educative opportunities that these experiences have offered to the students.

9.3 Research Context

The study is part of a research project on the fieldwork experiences of a broad range of Hong Kong secondary schools with different backgrounds and academic achievements. Schools in Hong Kong follow a centrally prescribed Secondary 4-5 geography syllabus in preparation for the Certificate of Education Examination at the end of S.5. The syllabus is generally narrowly interpreted by schools in Hong Kong (Stimpson, 1987). In S.4, most schools start with the teaching of physical geography. The school under study scheduled the field trips after the students had learnt rocks, weathering and erosion.

By choosing a qualitative methodology, the author is interested in insight, discovery, and interpretation rather than hypothesis testing (Merriam, 1998). The purpose of the study is to investigate the students' and teacher's experiences before, during and after geographical fieldwork which has included an adventurous element, and to understand what meanings students and teachers have derived from such experience. Experientially based studies are particularly valuable in understanding the fieldwork experiences of both students and teachers and what meanings they have derived from such experience (Lai, 1996a; 1996b).

The case study has adopted a multi-method approach in data collection: through individual interviews of teachers and group interviews of students, participant observation and documentary evidence. Some students were also invited to write reflective accounts after the field trip. A strength of multi-method approaches is the richness of the results of the investigation (Gerber, 1996). The researcher is also able to use different data sources to validate and cross-check findings (Patton, 1990).

9.4 The Case Study

The school under study is a co-educational secondary school located near several old public housing estates in north-west Kowloon, Hong Kong. Its students are also of mixed abilities and their public examination results are slightly below average in Hong Kong.

There are two geography graduate teachers in the school. Mr. P, the Chairperson of the Geography Subject Panel, has taught in the school for eleven years. The other teacher, Miss W, has been in the school for four years. In the 1996-97 academic year, Mr. P was solely responsible for teaching geography in the two S.4 Arts classes, S.4A and S.4B. The latter was considered by the teacher to be a relatively weak class academically.

Geographical fieldwork has been part of the school tradition for many years. In the year under study, S.4B went to the Bride's Pool area in north-east New Territories while S.4A took a boat trip from Sai Kung Town to Port Shelter. Bride's Pool is popular for study of rocks and stream erosional features like waterfalls. The Port Shelter area is noted for its erosional coastal landforms, such as cliffs, arches and stacks, formed by strong wave attack on the columnar-jointed volcanic bedrock.

9.4.1 DESCRIPTION OF FIELDWORK EVENTS

Mr. P had decided to hold the S.4 field trips at the beginning of the academic year, but he had only finalized the actual dates of the two trips less than two weeks beforehand. For both trips, he held the briefing sessions one or two days before the trips, during which he informed the students of the logistical arrangements and mentioned the names

of features to be observed during the field trips. However, he did not ask them to do any academic preparation beforehand. During the pre-trip interviews, many students were unclear of their tasks.

Though the modes of transport were different, the learning processes in both trips were similar. After finishing their morning classes, the students had about fifteen minutes to take their lunch and change their clothing before they left school. On the coach to the field site, Mr. P distributed to each student a one-page worksheet and an outline map. The design of the worksheets was relatively simple. At each checkpoint, the students were required to fill in the blanks with names of physical features or processes. The first letter of the missing word was supplied.

During the trips, Mr. P led the students to various checkpoints, pointed out the physical features and gave an explanation of their formation. Students were engaged in listening and filling in the worksheets. There was no group work of any kind. The other geography teacher, Miss W, accompanied the students on both field trips.

9.4.1.1 S.4B Trip to Bride's Pool

On the 45-minute coach journey to the field site, the students appeared happy and excited. After arrival, Mr. P first asked them to locate themselves on a contour map. At the next checkpoint, the students stood on a footbridge while he went down to the riverbed to point to the rock formations. Half an hour later, the party reached the base of Bride's Pool waterfall, after hopping on large boulders along the riverbed. On the way, a boy was stung on the head by bees and was in obvious pain for a few minutes. Some girls were initially unwilling to hop on the boulders and only proceeded with the encouragement of Miss W and the help of several boys.

After the break, the class proceeded to the base of Mirror Pool waterfall. Mr. P crossed a fence with most of the students; they went down to the riverbed and sat on a group of large boulders. Mr. P explained that the boulders had fallen from above because of the retreat of the waterfall. However, nine girls and Miss W did not go down. They stood behind the fence and probably did not see the features well.

To the students' surprise, Mr. P challenged them to climb with him up the 40-metre high steep valley wall and to return via another route. All the boys and several girls followed him. However, the nine girls and Miss W returned to the picnic tables via the original route. They waited there for the main party for about fifteen minutes, during which Miss W helped the girls to fill in the worksheet.

9.4.1.2 S.4A Sai Kung Boat Trip

On the half-hour coach journey from the school to the pier at Sai Kung, students were singing and chatting loudly. They boarded a small pleasure boat and headed towards Port Shelter in the east. Each student had to pay HK$80 (about A$16) for the trip. Many students were worried whether they would be seasick. A few took pills and several did not have lunch.

Most students appeared excited on the boat. They tried to find good seats so as to take a close look at the surroundings. At the first two checkpoints, they observed erosional landforms such as sea caves and cliffs with columnar jointings. Students were generally delighted in seeing these features and the splashing of the waves. The sea turned rough as the boat left sheltered water. While some students stayed at the bow and seemed to enjoy the rise and dip of the ship, six or seven students vomited. On the advice of the captain, Mr. P agreed to turn back and aborted the plan to see the third checkpoint which consisted of some famous sea arches and stacks.

On the return journey, the boat moored at the fourth checkpoint in calm water near a beach for half an hour. The teachers and most students went on the beach. Some played with the dogs, some threw stones and some walked up the hill. Afterwards, the boat returned to Sai Kung pier and the students took the coach back to school.

During the first half of the trip, most students attempted to complete the worksheets. On several occasions, the teacher, with the help of a loudhailer, asked the students to assemble on the top deck and look at the coastal features. However, at other times, students were in different parts of the boat and some could not hear him. The students who were seasick stayed inside the cabin most of the time.

After returning to school, Mr. P marked the worksheets of each class. He used one lesson with each class to discuss the answers and reminded them of where they could refer to their textbooks about their findings on the trip. He also pointed out what the students should pay attention to, including discipline, while they were in the field. He stated that his purpose was to combine the students' field experience with their classroom learning.

9.4.2 FINDINGS

9.4.2.1 Students' Dual Expectation of Learning and Fun

Nearly all the students were delighted at the announcement of the field trips. This was the first field trip for most of them in their schooling. Many students thought that the

main purpose of fieldwork was to follow their teachers to identify the rocks and physical features, and expected the field trip would help them understand better what they had learned in class. However, there was also a strong socio-emotional element – field trips were expected to fulfil the dual purposes of learning and fun. It was a combination of excitement at not having to attend lessons on a school day, expectation of play and chat and a desire to see things they have not seen before. This perception was most prevalent for S.4B students.

I: What do you think a geography field trip is?
S4: The whole class followed and listened to the teacher on information about rocks, take photos, measure things etc.
S5: There is fun. Unlike lessons, there are some concrete objects for you to see.
S3: Chat and laughter.

The teacher, Miss W, also agreed that the students were very happy at going on field trips because they felt that they did not have to be confined in the classroom. In the section below, we shall see that this dual expectation of learning and fun in field trips was not only upheld, but also actively promoted, by the teachers. It significantly influenced how the students interpreted their fieldwork experiences.

9.4.2.2. Teachers' Intent of Fieldwork as Adventure

Before the field trips, Mr. P stated systematically that the purposes of fieldwork were manifold – to strengthen students' learning of geography, to improve their motivation in learning, to foster interpersonal relationships and for personal stimulation:

> *The uses of field trip are manifold.... First, students can leave the classroom to learn in a new environment. Under a new learning atmosphere, their learning will be more effective in several aspects. First is about concepts in geography. When students have seen and touched (the features) themselves, they would acquire deeper impressions than they would have obtained from textbooks. The second point is about skills, mainly map skills. The reason is that in the field, (they will have) more opportunities to practice map skills. The third point is about interpersonal relations. I believe that fieldwork can improve both the relationships between teachers and students and among students themselves. The fourth point is a personal one. I always stay in school. Doing some work outside (in field) will be a refreshment to me.*

For subject learning in the S.4 field trips, he reiterated the importance of "course-relatedness"; fieldwork was seen as an adjunct to classroom learning. He explained that he had focused on the syllabus, designed the field trip in accordance with the topics

taught in class, and scheduled them on normal school days so it would resemble an "ordinary" lesson.

The qualitative investigation, however, has suggested that he was less concerned with academic learning than the affective outcomes. His design of worksheets was remarkably simple. Unlike many schools, there was no project work after the field trip. The students were also not required to do any preparation of an academic nature beforehand. Most of them came to the fieldwork with only a sketchy idea of the tasks. His key strategy was to let the students see novel features and to engage them in adventurous activities. He deliberately selected routes so his students would be thrilled by the climb up a steep valley wall or feel high amidst the rolling of the boat in the strong waves.

Memorable experience. Miss W said that Mr. P liked to take the students to places that were a bit dangerous. She recalled that the students found the past field trips exciting and memorable:

> *Once we went on a boat trip from Sai Kung. Because the waves were very high, our students remembered very well what a trip was and what a sea cave was. I taught that (S.4) class; when they were in S.5, they still always asked me 'when are we going on field trip?' 'Let's take the boat again?' They always mentioned about this. ... They were not afraid (of being seasick). Many people suffered from seasickness but they still liked to go. They were looking for excitement.*

Like Mr. P, she was of the opinion that "real" fieldwork should include an element of risk which will make a deep impression on the students. She offered a reason for the selection of route on the Bride's Pool trip:

> (The route) *is not too dangerous, and at the same time, however, there are some minor difficulties on the route. The point is that if you took an easy route, students would not take the trip seriously. On the path leading to the Bride's Pool, there are some boulders which students would have to do some climbing, and they will form a deep impression. I prefer to choose a route with some difficulties, and it makes the trip more like a real field trip.*

Community Life. In addition, Mr. P conceived adventure as a means to develop mutual concern among the student community. He acknowledged that his holding of slope climbs on the Bride's Pool trips over the years was done on purpose:

> P: I did it on purpose. ... I wanted to leave them a special experience. ... Besides, the climbing can also enrich their 'communal lives'. We have

climbed that hill before; basically, I think it is safe. ... The main aim was to leave them some good impression. It had been a success in the past few trips.

I: What do you mean by "a success"?

P: Students were thrilled about it; they talked about it a lot. (laugh) ... After half a year or one year, they might still talked about it. Even on the graduation dinner they still talk about it.

The adventure would give also an opportunity to narrow the gap between the boys and the girls:

> *In managing the girls, we have tried this. (Miss W) and I have implicit understanding. If we see that the girls are unwilling to go (climbing), she will take care of them. If they are willing, I will bring them as well. In fact, if the girls are willing to go, it is even better because the boys will have a chance to take care of the girls; their 'communal lives' would become richer. That's my intention. ...*

In another interview, he also admitted that he had deliberately brought his students to areas of strong waves during the boat trip. The teachers, focusing on the affective outcomes of fieldwork, were determined to let students attain unusual and memorable experiences by undergoing adventurous activities.

9.4.2.3 Students' Engagement in Adventure

The difference between the two trips was that the students on the Bride's Pool trip did not expect that there would be a steep climb while those on the boat trip had been warned by the teacher of getting seasick. A student on the former trip recalled his surprise of the climb:

> *I did not expect that there will be climbing up the hill. I thought it was just walking around, seeing a few features, getting and observing a piece of rock, like that. I did not expect we would climb here and there, to the waterfall.*

Excitement. Most students considered the climb up the valley wall or the boat trip exciting and challenging. For the S.4A students who attended the boat trip, many described that they had felt 'high'. Some even hoped that the waves could have been bigger. They were still joyful when they shared their experiences in the post-trip interview:

S3: I found (the boat trip) very exciting and enjoyable.

S5: I have never tried renting a boat and facing the open sea before. ... It was good to train our guts. We can also experience the power of the waves. It was so real and horrifying, which the teacher could not deliver in class.
S4: On the contrary, I found the waves not strong enough. (laugh) ...
S2: It has increased my impression. You won't be just studying in a field trip. The excitement of the wind and waves will make a deep impression on you.

To some students, the boat trip was a highly emotional event. At the end of the trip, a student approached the researcher and said, "I feel very happy, I don't want to leave. But when the sea was rough, I was afraid and wanted to leave. Now being here, I don't want to go. I miss it."

Collective experience. These experiences were not just perceived as personal ones, but as collective ones. It was more prevalent among the S.4B students on the Bride's Pool trip:

I: What do you think of climbing up the hill?
S3: (laugh) Good, quite interesting.
S6: (laugh) Interesting ... I seldom climb this way.
S3: Climbing with a whole team.
S6: I had to follow the pace of the one in front. When I walk slowly, those at the back have to slow down. When the one in front walks slowly, I have to slow down as well. (laugh)

I: Were there any differences between your classmates in the field and in the classroom?
S2: I feel something special.
S3: It seems our feelings were joined together.
S2: They were very funny. Interesting. ... (laugh) The moment when they could not climb up and slip down.
S5: Stung by the bees. (laugh)

In summary, it seems that the deliberate adventures organized by Mr. P have worked for most students in terms of creating deeper impressions and memories. In the Bride's Pool trip, there was a communal spirit through the interaction between the teachers and the students and among the students during the walk and the climb. This was less evident in the boat trip.

9.4.2.4 Avoiding or Withdrawing from the Adventure

Despite the overwhelming excitement, for both trips there were a number of students who avoided the challenges or who did not get involved in the adventurous experience. In the Bride's Pool trip, as mentioned in Section 4.1.1, several girls had difficulty in the rock-hop and did not join the climb up the valley wall. In the Sai Kung boat trip, a number of students appeared seasick and stayed in the cabin throughout the journey. In order to understand their experiences, these students were interviewed separately.

Bride's Pool Trip. An interview of two girls, Man-wai and Joe, has revealed that the reasons for their non-participation in the climb were both physical and socio-emotional. First, they found the route to the base of Bride's Pool rugged and hopping on the boulders difficult. Joe described that:

> (The boulders were) *very high. My leg is not long enough. I didn't know whether I should jump down or not.*

Second, when asked why they had not gone down to the riverbed at Mirror's Pool, they explained that they had seen their classmates climbing down with great difficulty. They claimed that they could hear their teacher and see the features well behind the fence. Moreover, they had not expected that their classmates would have climbed up the valley wall without returning along the original path.

In retrospect, they felt happy that they had stayed behind so they did not have to join the climb. Joe had the following comments:

> I felt sorry for them. They had to leave along that (steep) path. [Man-wai agreed.] ... If I were one of them, I would have regretted that I had (gone down to the riverbed). I would stand there pathetically. I did not want to walk that way, but I couldn't choose to go back through the original path for there was no one with me. That's why it was good not to go down in the beginning. ...

Moreover, they did not only interpret their experience as a physical endeavour, but also as a social event in which interpersonal relationships are prominent. First, the two students resented that their friends did not stay close with them on the trip:

> J: I've found the people very selfish. ... They were just concerned with walking on their own. ... (Because) we were walking in a group of four to five people. But they walked faster and faster and left a girl and me behind. They hurried us to catch up and when we said we couldn't, they neither gave us a hand nor waited for us. They just kept on walking.

I: Are they good friends of you?
J: Yes, they are, but I thought they were bad. ...
M: It looked as if no one preferred to be left at the back. So all tried to walk faster to avoid it. (laugh) They felt insecure. (laugh) ...
I: Why didn't they want to be at the back? ...
M: (They were) afraid of being at the back.
J: Afraid of being caught up ... (they kept on saying) 'let me walk first'.
M: Yes.
J: They wanted to assure that they would be at the front. This revealed the selfish side of them.

Second, they had mixed feelings of being helped by Michael, a talkative boy who was repeating the year, to hop on the boulders. They would have preferred the help to come from Mr. P, which they seemed to perceive as a kind of moral responsibility.

M: Some of the boys helped others down the boulders.
J: Michael.
I: Yes, I saw that too. Is he like that in class?
M: I don't know.
J: He makes himself looks comical. (M laughed.)
M: He pretended to be helpful.
J: It's because the teacher asked him. If I could get down to the rocks on my own, I would not have needed his help.
M: Yes, he helped me several times on the trip. The path was rugged ... and I really needed someone to give me a hand. Otherwise I couldn't get down (from the rocks).
I: Was it useful then? What do you feel about that?
J: Of course it was useful. Without him, I would have fallen. (laugh)
M: I think it's better if the teacher provided the help himself. ...I can't explain, but I do feel it that way.
I: Why would it be better?
J: The teacher has the responsibility to protect us.
M: The feeling is different.

The students seemed to trust that their teachers would look after them well. For instance, Joe recalled that she had slipped once and Mr. P came to assist her and she was moved. She also thought Mr. P would not force them to climb up the valley wall because he was nice, and Miss W would take care of them whatever routes they chose.

Self-esteem was another factor which affected the students' intent to take part in the adventure. Joe acknowledged that she was conscious of her figure during the trip:

I: Would you join a field trip in the future?

J: If it were a different place and if the classmates went, then I would go. It's not that tiring; in fact, I was just being lazy.

I: Why?

J: Hmm. Because of my figure. I am fat and it would be tiring to walk. People would also mock at me.

I: You mean the boys? ...

J: Not necessarily. Everybody is the same and it is tiring to walk too.

Sai Kung Boat Trip. Not all the students participated actively on the boat trip. Several students, including Pui-yee and Kathy, sat passively in the cabin. Pui-yee was seasick shortly after the boat passed the first checkpoint and had vomited several times. Though she was eager to participate, seasickness had seriously dampened her spirits:

I: What do you think of the trip? Is it different from your expectation?

PY: When I got on the boat I began to feel sick and listless. So I didn't pay attention through the trip, except at the first check point. (The trip) was...more or less the same as I'd expected. Quite good. I'd have found the trip more enjoyable if I hadn't felt sick.

I: Are you now happy?

PY: Quite. ... But vomiting spoilt my mood.

I: How many checkpoints have you seen?

PY: Only one. Because after the first one, I started vomiting. Then I lost my mood because I was occupied with how much I would vomit. So I was not interested in looking around and would like to rest. ...

I: Do you feel you miss something?

PY: Yes. It is a pity.

I: How do you feel? Your classmates are so excited.

PY: I admire them. ... It looks like I have missed a chance because (sigh) perhaps I do not know how to go on sea trip, and therefore I have missed a chance and cannot see the things. I want to see it but I can't. ... Perhaps next time.

She had a mixed feeling of being happy at a field trip and frustration at getting seasick. Therefore she expressed her reservations when asked whether she would join a boat trip again:

I: Would you come again?

PY: I'd got myself psychologically ready first. I would consider whether I should take any food before the trip ... and whether I would vomit badly.

I'll think about it. ...

I: So you may not come again?

PY: Yes. Though I'm eager to come, I don't know why I have vomited so badly. Because if I begin to vomit right on deck, then there is little difference of being present or not. Though I am very happy.

I: Right, you could not see what's around.

PY: You did not have mood to look around. Therefore there is little difference of being present or not.

The other student, Kathy, sat alone, remained quiet and looked serious throughout the trip. After the trip, Miss W remarked that she was very scared right on deck and was more so when the ship began to roll. Miss W had asked four students to accompany her in the beginning. Throughout the trip Kathy did not move an inch and her classmates did not approach her.

During the interview on the return journey, Kathy said she had taken the seasickness tablets and did not feel seasick. She did not express much emotion and her answers were brief.

I: What do you feel about this trip?

K: Quite good. (laugh)

I: How good was it?

K: It is fun.

I: I see, but you appeared to be so quiet?

K: ... I looked at the scenery. ...

I: What did you expect of the field trip?

K: ... It is more or less the same as I expected.

I: What were your expectations?

K: Seeing the mountain and the water ... I saw them this time.

However, she indicated a strong preference of field trips over classroom lessons. She scored a "seven out of ten" for the field trip, and gave only "five" for classroom lessons. But she was not able to elaborate further.

The above two cases suggested that for attempts to create excitement through physical adventure, there would probably be a group of students who would be left out of or withdraw from the adventure because of physical or socio-emotional factors.

9.4.2.5 Disappointment over Lack of Intellectual Engagement

In spite of the overall enjoyment and excitement, some students of S.4A, who are of higher academic achievement, appeared to be more critical. Their frustrations were often related to academic learning. They were disappointed with the inadequate time for preparation before the trip. They also thought that time for the latter half of the trip, in which the students lingered on a beach, could have been more productively used for learning if the teacher had better anticipated the early abortion of the journey due to strong waves.

In addition, they were disappointed with the lack of a collective learning atmosphere on the boat trip. Many of them apparently did not merely conceive their 'collective spirit' as restricted to fun and play. They would have liked their classmates to stay together when the teacher gave his explanations. Some expressed irritation with their peers who had got 'too wild' and who were not involved in learning.

I: On the trip, did your classmates behave differently from what they did in class?

S1: Getting wild! They were so happy and lost control, forgetting that this trip was taken for study's sake....

S2: Sometimes they were playing too much - as if they were going for play's sake on a holiday. This would lose the meaning of our trip, which was to study the landforms....

S5: Sometimes I went down the cabin, I found these students seldom get to the deck to hear what the teacher said. They were there listening to Walkmen, resting or doing nothing, which was but a waste of time. They couldn't observe how the wind ... formed the waves.... They were there listening to Walkmen and enjoying the scenery. That was no longer a field trip.... They also liked to play in school.

9.4.2.6 Desire for Tactility

Despite the excitement on the boat, some S.4A students had a sense of disappointment and deprivation of not being able to walk on shore and come into physical contact with the coastal features. One student expressed his desire to be close to the environment through tactility:

> It is a matter of 'intimacy'. (laugh) As you were accessing the spot by boat, you could only view the spot from a distance on the sea. You couldn't go there and touch the rocks, and understand the materials which make them up. I want to sense them through touch; I would feel 'intimate' to the object.

Moreover, students would like to collect some specimens for memory:

S5: Yes, there is some excitement. However, since we were either standing or sitting on the boat to observe the features, there was too little walking done on the trip. ... Being on shore, we could collect some stones and pebbles and touch them, though, I know it may be difficult to land on some places.

S2: Yes, if we can bring some stones home, then we can commemorate the trip. At least it would prove that we have been to the trip. Ten years' later, we can still remember the event. ... We shouldn't have returned empty-handed.

Perhaps the potential of fieldwork is best realized if it brings into play all the learning senses whether sight, touch, hearing or smell. It would also satisfy the desire of some learners to build up of a more intimate relationship with the environment.

9.4.2.7 Teacher's Reflections

After the field trips, Mr. P restated that the purposeful inclusion of adventurous activities, similar to past years, were successful. He thought his intention of creation of a deep impression and enrichment of the community life of the students had been achieved.

> I saw that they aided one another. Sometimes you pulled me up and sometimes I pulled you up and so on. ... For lower form students, like S.4 and S.5, I think they do need this experience, which is something different from their everyday lives. For my part, I go every year. But for them, they may just go to one or two trips in their life (laugh). Actually I really did that on purpose. Especially when I noticed that they were not attentive to what I was saying and did not learn many things, I wanted to leave some deep impression on them.

He disclosed that, on the Bride's Pool trip, several passers-by had warned him of the bees along the footpath to the base of the waterfall. But he decided to proceed because he did not want to "disappoint" the students by missing the site. He also acknowledged that the reason of the climb was not intended for academic learning.

> Actually there is a checkpoint which could be observed (on the top of the valley near Mirror's Pool). We didn't go there because the main purpose (of the climb) was not for learning.

He also admitted that the purpose of the boat trip is both "caves" and "waves":

> Actually I deliberately brought them to places where the waves are strong. The components of the trip consist of not just the "caves", but also the "waves". ... You would come across these things too while you are on the sea in the south-east. While students were rolled on the boat, they would get a stronger impression.

With years of experience, he was well aware that some students might withdraw from the adventure – girls avoiding the climb or students getting seasick. He faced a dilemma, but he was determined to repeat the adventure year after year. For example, he rejected seeing coastal features on land because it would deprive students of the excitement of a boat trip.

9.5 Discussion

What makes the case study distinctive is the teachers' determination to let students attain unusual and memorable experiences by undergoing adventurous activities with an element of risk-taking. Despite the claim of "course-relatedness", it was apparent that the teacher is less concerned with academic learning than the affective outcome. For him, fieldwork is not simply an adjunct to classroom learning, but a new way of "communal life" in which the teachers, boys and girls interact and develop interpersonal relationships outside the school routine. On this aspect, his objective is similar to a tenet of adventure education which is to use adventure as a vehicle to enhance personal growth. Students were exposed to adventurous risk-taking situations; they stepped beyond their comfort zones in order to learn and grow (Wurdinger, 1997).

He was affirmative and confident that his strategy would work and the students would enjoy the field trips. Before the field trip, his focus was apparently on motivating the students. He enjoyed the way his past students spread the word of the excitement and enjoyment of previous field trips, and thought a culture of fieldwork existed in the school. He did not think the students required much preparation before field trips. The worksheets and instructions were given on the coach. Instead of systematic evaluations, he judged the success of his trips through the enthusiasm of the students in asking for another trip and the words of his past students.

The students were motivated by the opportunity to leave the perceived boredom of the classroom and go on field trips on a school day. They would like to see in the real setting the geographical features that they have learned in class. However, for them, field trips have a dual purpose – there was a prominent desire to have fun and play in the field trip.

Students were generally actively and emotionally involved in the adventurous challenges during the trips. The teachers' intention of leaving a deep impression on the students seemed to have been realized. Learning in the field was found to be more stimulating than classroom learning. Some students preferred field trips to picnics because they perceived a sense of purpose.

However, amidst the challenges, there were a number of students who have adopted different coping strategies. Some avoided or were compelled to withdraw from the adventurous experiences. The reasons were sometimes physical, as for students who became seasick on the boat trip. For others, socio-emotional considerations were crucial. It could be the low self-esteem of one's figure, or the desire to abide by the decision of peers. During times of physical difficulty, some students were more demanding of being looked after by their peers or teachers. The gender issue was also evident from the data. A number of girls expressed their preference for male teachers to be present.

In summary, the field trips in the case study were remarkable in terms of their emotional impact on the students. Experiences were well remembered. However, they were also characterized by a tension of purpose between academic learning on one hand, and fun and excitement on the other. The teacher was faced with contradictions, but was clearly more inclined towards the "waves" than the "caves". The preferences of the students differed – while some were overwhelmed by the experience, some discovered that there was something lacking in their learning.

9.6 Intellectual-focused and Affective-focused Fieldwork

The findings in the above case study have demonstrated the need for fieldwork to go beyond fieldwork as intellectual and instrumental learning. Together with other studies, they have led the writer to draw a further distinction of fieldwork strategies by their focus on intellectual and affective learning (Table 1). This distinction is meant to distinguish between different focuses and fieldwork does not exist as separate entities.

Intellectual-focused fieldwork is often syllabus-driven and is aimed to increase scientific understanding of geographical concepts or technical competence. Social and personal development and environmental education was seen as coincidental and not emphasized. The world was viewed with neutral objectivity. Teachers tend to neglect students' emotions and feelings and attend only to geographical facts and concepts that they consider worthwhile. For most fieldwork, the purposes appear to be mainly cognitive-related and were confined to consolidation of knowledge previously learned in class.

Table 1. Intellectual and affective dimensions of fieldwork

	Fieldwork with Intellectual focus	Fieldwork with Affective focus
Teachers' orientations	Pursuit of rational, cognitive ends. Subject-specific orientation. Aims to know the subject by using findings to exemplify a concept. Often syllabus-driven. Emphasizes reinforcement of knowledge previously learned in class.	Fieldwork as a heuristic or experiential process. Student-environment orientation. Aims to develop students' sense of wonder about nature or senses of people and places. Acknowledges emotions and feelings. Emphasizes affective learning.
Conceptual development	Emphasizes scientific reasoning. Views the world with neutral objectivity. Often dependent on conceptual understanding of textbook material or on processed data, often unrelated to field observations and inner feelings.	Views knowledge also as a product of learning from inner feelings and personal experiences. Conceptual understanding built on heuristic field experiences. Accommodates the passionate aspects of learning.
Social and personal development	Social and personal development seen as coincidental and not emphasized.	Values personal development in confidence and self-esteem, and development of interpersonal relationships among students and between teachers and students.
Environmental attitudes	Not emphasized unless related to syllabus.	Values development of value stance on people-environment issues
Affect	Teacher tends to neglect students' emotions and feelings and attends to knowledge and concepts that he/she considers interesting and worthwhile	Teacher attends to students' feelings and emotions about events and places which students consider interesting and memorable
Skills	Measurement and quantitative techniques used. Technical competency of skills emphasized.	Skills in heightening awareness and group work. Activities may step out of students' comfort zone. Technical competency not emphasized.
Timing	Trip tightly scheduled and hectic, attempting to cover as many features as possible. Teacher wants to transmit as many facts and concepts as possible.	Time allowed for student experiencing and reflection. Teacher wants to foster student engagement and involvement.
Evaluation	Evaluation often confined to accuracy of knowledge. Utilitarian purpose.	Students learn to manage their own experience. Values life-long consequences

Affective-focused fieldwork stresses emotional and affective learning. It is more geared towards personal and social education and development of environmental values of the students. Teachers attend to students' feelings and emotions about events and places which students consider interesting and memorable. For example, in the case study, the teachers conceived of adventure as a means to develop interpersonal relationships amongst teachers and students:

> I wanted to leave them a special experience.... Besides, the climbing (up the valley wall) can also enrich their 'communal lives'.... The main aim was to leave them some good impressions.

The challenge to field educators is how to strike a greater balance "between attention to conceptual understanding and consideration of the neglected area of affective learning and experience" (Job, 1996, p. 44). Students often face challenges in field trips in novel settings. They could be physical ones in walking up slopes or hopping on boulders in streambeds. They could be interviewing of strange persons in socio-economic surveys. They are sometimes accompanied with stress or perceived risks. The physical magnitudes of the stress or risks are not significant; such 'stressful' experiences can be highly educative with growth potential (Leroy, 1983/1995). However, for most field trips, unfortunately they are often perceived as "by-products" of an academic enquiry and opportunities for learning are often missed by teachers.

To paraphrase from Leroy (ibid.) on his comments on adventure, fieldwork is not just a "materialistic experience", rather, it is "a spiritual or perhaps a humanistic experience" (p. 451). The prevalent fieldwork is often "ruled by scientific process. Explanation, logical and derivable, is expected and usually obtained" (ibid., p. 451). However, many of the things students experience in fieldwork are not necessarily perceived as useful in the academic or materialistic sense, yet these experiences are often extremely valuable to their personal and affective development. Field educators have often justified fieldwork by their multiple purposes. They should no longer regard these personal experience and feelings as by-products of academic learning; they are inseparable parts of fieldwork learning.

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10. FIELDWORK IN THE SCHOOL GEOGRAPHY CURRICULUM - PEDAGOGICAL ISSUES AND DEVELOPMENT

ASHLEY KENT and NICK FOSKETT

10.1 The Development of Fieldwork in School Geography

In the English literature it is not hard to find eulogistic references to the benefits of school geography. For instance:

> *Fieldwork is the best and most immediate means of bringing the two aspects of the subject (i.e. a body of knowledge and a distinctive method of study) together in the experience of the pupil. Therefore, fieldwork is a necessary part of geographical education; it is not an optional extra.* (Bailey, 1974, p.184)

> *Fieldwork is not a separate teaching style to be adopted in geographical education, but a sine qua non of all good education through geography.* (Lidstone, 1988, p.59)

> *Geography without fieldwork is like science without experiments; the 'field' is the geographic laboratory where young people experience at first hand landscapes, places, people and issues, and where they can learn and practice geographical skills in a real environment. Above all, fieldwork is enjoyable.* (Bland, Chambers, Donert and Thomas, 1996, p.165).

Then? Well not quite, since in several parts of the world the tradition of school fieldwork is far from established. For instance, in the USA 'fieldwork is not a common part of the geography education in the United States', (Bednarz, 1999, p.164). This is arguably also true of college level fieldwork in the USA where according to Allender (1999), fieldwork is an elective in most courses because of other reasons: it is expensive, there are legal liability worries, virtual reality fieldwork seems more cost-effective and there is a lack of skilled instructors. A similar story is told from China, where 'it seems unlikely that fieldwork will assume a key position in geography in China' (Zhang, 1999, p.175), and from the Netherlands, where 'class-based study of secondary sources has become more important than enquiry outside the classroom' (Swaan and Wijnsteekers, 1999, p.171).

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 171-193.

Some have argued that in England the battle to secure a place for fieldwork in the geography curriculum has been won. 'The struggle to get fieldwork accepted as an integral and essential element of secondary school geography examination syllabuses has long passed' (G A Sixth Form – University Working Group, 1984, p.209). Even more confident was Everson (1969) in suggesting that: 'It is a truism to state that the campaign to put fieldwork into the mainstream of school geography is now over.' Geography educators in England in 1999, however, would be wary of making such claims since there are a number of challenges to be faced if the fieldwork tradition is to be maintained. Since the two authors of this chapter are English most of its content concerns fieldwork undertaken by English schools. Little had been written about fieldwork in higher education until the most helpful overview from Kent, Gilbertson and Hunt, (1997).

Although fieldwork was undertaken by a number of teachers in the interwar years, 'it was not until after the Second World War that fieldwork seriously began to intrude itself into teaching – and, incidentally, into external examinations' (Ministry of Education, 1960, p.13). Much of the early post-war growth was due to the provision of courses for 'A' level students, particularly laid on by the Field Studies Council (FSC). 'During the 1950s and 1960s thousands of 'A' level students were introduced to fieldwork in the one-week residential courses at FSC centres such as Flatford Mill, Juniper Hall, Malham Tarn and Preston Montford' (Boardman and McPartland, 1993, p.67). However, it was the establishment of the Certificate of Secondary Education (CSE) in 1965 and its successor (the GCSE) in 1998 which provided an official boost for fieldwork for pupils below the age of 16 years. This legitimation continued with the establishment of a National Curriculum in 1988. For instance, the 1995 Geography National Curriculum required that all pupils 'undertake fieldwork' (DFE, 1995 : 2) making it a statutory obligation for all schools in the state sector. Reports of OFSTED (Office for Standards in Education) inspections of secondary schools reinforced that requirement:

> *The use of practical and field based activities make a fundamental contribution to good teaching in all key stages. A well planned programme, with activity in all years, from local studies to more distant residential courses, stimulates students' curiosity and develops skills, knowledge and understanding through personal experiences* (Smith, 1997, p.126).

Since such comments came from the senior geography HMI (Her Majesty's Inspectorate) and were based on 7400 lesson observations they carry a certain weight!

In addition to the commitment of many geography teachers, two other developments have reinforced the value and importance of fieldwork in England. Firstly, three major national land use surveys have been undertaken in which pupils were the main data

collecters. These were Dudley Stamp's land utilisation survey of the 1930s; Alice Coleman's land use survey of the 1960's; and the Geographical Association's "Land Use-UK" survey in 1997. Coastline 2000 is planned for the near future! Secondly, and probably most influential in England, has been that individual study investigations and enquiry have been built into GCSE and 'A' level syllabuses, so that most students experience the joys and challenges of undertaking personal geographical research.

The most lasting and arguably most common justification for organising fieldwork comes from former students whose memories of such activities are generally positive! 'For most geographers field work is a key component of their enthusiasm for the subject and one of the strongest elements of their own personal biography' (Foskett, 1997, p.189). A recent study entitled 'The experiences of higher education (HE): the case of geography teachers in England' (Kent, 1999), reported that most teachers found difficulty in recollecting the detail of their HE geography courses, but not so for the fieldwork they undertook! Teachers recalled, for instance, 'a heavy emphasis on residential, practical fieldwork... this was a strength of the course' and 'this course inspired me, in particular with fieldwork and enthusiasm for getting out there!'

But what is the place and role of fieldwork today? Kent et al. (1997) summarise the key issues facing fieldwork in geography in the late 1990s, and although this list refers to HE there is considerable significance here for school geography. The key issues identified are:

- The importance of the evaluation of the various different modes of field teaching and their effectiveness.
- The need for and value of planning progression in fieldwork teaching.
- The problems of maintaining small-group teaching in fieldwork.
- The problems of fieldwork financing and the question of 'value for money' in fieldwork teaching.
- Gender issues in fieldwork planning and operation.
- The conflict between specialised 'option-based' fieldwork and the role of fieldwork in integration within geography as a whole.
- The establishment of links between project-based fieldwork and student projects or dissertations.
- The relative effectiveness of different forms of fieldwork assessment.
- The potential of virtual reality fieldwork.

Smith (1992) in his research into geography fieldwork planning has raised similar issues which he sees as needing to be addressed in the near future since he argues that 'fieldwork, in its present form, is under threat and yet it still has a major role to play' (Smith, 1992, p.397). The questions (and related issues) he asked were:

- Are the aims and objectives well known and clear enough to be accepted not just by the geography department but by pupils, parents, other staff, the head teacher, governors and industrialists for example?
- Has the fieldwork planner got the motivation, time and the right attitude to overcome all the constraints so as to achieve these aims and objectives and to take advantage of the improved and widened range of opportunities available to him or her?
- Do the benefits for pupils and staff outweigh the costs at the present time?
- How much of these 'costs' are environmental, economic or organisational?
- With increasing complexity is there sufficient time to plan and implement fieldwork programmes properly and if not where is the time going to come from?
- How much of the success or failure of putting an ideal fieldwork programme into practice is due to external (to the school) rather than internal factors?
- To what extent is the provision of geography fieldwork now influenced by economic and administrative rather than educational preconditions? If this extent is significant how much of a threat does it present?

These issues are of importance to all teachers at the start of the 21st Century. In the sections that follow, we seek to explore and develop responses to some of the key pedagogic issues in fieldwork.

10.2 The Aims of School Fieldwork

The questioning and review of curriculum at all levels from national scale to specific planning for the classroom is inherent within most educational systems. Geography has been in the vanguard of such review in many countries, partly as a result of the innovation of curriculum developers in the subject, and partly as a result of the continuing threat to its existence within school curricula where the core fields of mathematics, science and languages have been given increasingly greater emphasis. Geography has been both the site and stake of many macro and micro political battles in the curriculum war. Joseph (1985, p.8) challenged the geography establishment in Britain to demonstrate "what...is necessary to enable geography to make its distinctive contribution to the breadth and balance of the whole curriculum". Essential within that process is the clarification of the aims of each element of the geography curriculum, and the frequent cry that fieldwork is an essential component of the geography curriculum requires explicit demonstration and justification.

The aims of fieldwork have traditionally been implicit within the dominant methodologies of fieldwork practice, as outlined by Foskett (1997, p.195). The traditional approaches, for example, of what Job (1996) terms the 'fieldwork excursion' had aims rooted in the development of content knowledge. Within this broad observational paradigm, the expedition approach focused primarily on the

exemplification of classroom based work in the field, while adding some element of physical challenge to the process. In contrast the Cook's tour had the same aims but without the physical challenge. The data collection/hypothesis testing and field enquiry approaches (e.g. Hart and Thomas, 1986, p.205) extended the learning opportunities available through fieldwork, and promoted the application of learning objectives to the planning of fieldwork. Learning in the field became as rigorous as learning in the classroom from a planning perspective, and the fieldwork training for teachers described in many recent books has prioritised the clarification of learning objectives (e.g. Richardson, 1998,). But what are the objectives of fieldwork that make it distinctive from classroom-based work, for without such clarification the case for the inclusion of fieldwork even in a strong geography curriculum is hard to argue?

Fieldwork may have aims related to knowledge, understanding, skills or attitudes and values in relation to 'learning' in Geography specifically or in relation to wider educational goals such as enhancing environmental awareness or equipping pupils with generic practical and intellectual skills. Boardman's (1974) study of the objectives of fieldwork as perceived by secondary school teachers in the West Midlands in the UK, provides some useful insights into early perspectives on fieldwork aims. Of the 30 objectives identified by the teachers, the majority are related to cognitive aims of learning and the enhancement/application of skills initially developed in the classroom. Of those seen as most important by teachers, a focus on mapping interpretation skills, e.g. 'to relate landforms to contour patterns' - ranked as the most important objective, and on the recognition and exemplification of features and processes learned in the classroom, e.g. 'to comprehend in the field concepts learnt in the classroom' - ranked as the sixth most important objective, is clear. Affective domain objectives also appear within Boardman's results, but are given less emphasis by the teachers. The objective 'to enjoy the study of Geography and acquire a deeper interest in the subject' ranks fifth in the priority list of objectives, but other affective aims, for example, 'to show an aesthetic awareness of and respect for the countryside', and 'to cooperate with the teacher and other pupils outside the classroom, are seen to be much less important. Beyond subject-specific cognitive and affective aims, Boardman's study shows only limited evidence of wider fieldwork aims. Contribution to pupils' physical development is limited to geography-specific skills, and there is no substantive reference to transferability in the skills and knowledge acquired - geography fieldwork has, from Boardman's research, aims which are quite specific to the subject. Graham Smith (1999) has repeated Boardman's research in a contemporary context, and identified an increased emphasis on the practice of classroom-acquired skills in the field, particularly in relation to data collection and field measurement. Smith identifies, too, the increasing importance of affective objectives, although they still play a secondary role in relation to cognitive objectives, and there is still little evidence of wider aims for fieldwork in Geography.

The importance of including both affective and cognitive aims in fieldwork planning has been emphasised by many writers (e.g. Job, 1996; Foskett, 1997; Nundy, 1999). Peter Smith (1987), writing in the context of geography, but also of outdoor education and environmental education, identifies the aims of fieldwork in relation to three broad categories of experience – outdoor studies, outdoor pursuits, and personal and social development. 'Outdoor studies' is predominantly the field of cognitive development, with an emphasis on acquiring new knowledge, applying classroom-generated ideas in the field, and generating questions and hypotheses for testing by empirical methods. A key focus here is on the development and practice of skills, including subject specific skills such as field sketching, generic skills such as data collection, and intellectual skills such as problem solving. The integration of affective development within outdoor studies is also drawn out by Smith, though, through the enhancement of an affinity for the human or natural environment, and the development of a sense of place and personal environmental responsibility. This affective arena is central, though, to Smith's second category of 'personal and social development', which stresses the development of personal awareness and growth and the enhancement of skills of co-operation, teamwork, and understanding of other pupils and teachers. The third of Smith's categories is that of 'outdoor pursuits' in which the emphasis is strongly in the field of psychomotor development. Experiencing personal physical challenge and enhancing practical skills contributes to such development, but also links strongly to affective development in terms of personal development.

Smith's (1987) view of the aims of fieldwork is comprehensive, but leaves as implicit, however, the processes of reinforcement that link the three categories of aims synergistically. Furthermore, it is based primarily not on empirical evidence of the processes at work but on the evidence of experience - the observations of individual teachers planned intentions, rather than measured outcomes, and the accumulated evidence from inspection systems. While this may be important in providing classroom credibility to the ideas, it is important to consider whether research evidence can provide a contribution to exploring the ideas further or identifying the processes of synergy. Two research directions provide this evidence to:

a) justify the inclusion of fieldwork in the curriculum by providing outcomes (or aims) that contribute distinctively to both geographical and wider learning;
b) refine the identification of fieldwork aims to optimise the achievable outcomes from specific fieldwork activities.

The first of these directions is the research within the field of educational psychology which suggests that there is a strong link between experiential learning and improved pupil learning outcomes. The concept of 'meaningful learning' (Ausubel, 1968) emphasises the gains that derive from 'discovery' learning rather than rote learning, while the principles underpinning constructivist views of learning (e.g. Driver and

Easley, 1978) emphasise hypothesising, active enquiry and the testing of ideas in unfamiliar environments as promoting enhanced learning. The idea that many aims for geographical learning for pupils can be accelerated or enhanced by the experience of fieldwork may be important in having curriculum or lesson aims that incorporate fieldwork approaches.

The second direction is research into the fieldwork process itself, which draws out the importance of affective domain gains for pupils of all ages and has also begun to examine the relationship between affective and cognitive gain. Mackenzie and White's (1982) work with pupils in Australia identified the overall cognitive gain from fieldwork, and they note the enhanced gain from 'active' as opposed to 'passive' fieldwork. They suggest that 'memorable episodes' (such as getting wet through working in a river) enhance learning and improve long term knowledge retention, and that explicit planning of such episodes into the fieldwork and their linkage to specific knowledge outcomes can be a deliberate strategy linked to specific learning aims.

The suggested link between affective and cognitive gain has been supported by the work of Kern and Carpenter (1986) with US college students. Using an experimental method in which one group of students undertook transect work in the field while another did so theoretically in the classroom, Kern and Carpenter showed that while there was no difference in gain between the two groups with 'low order' cognitive fields such as knowledge recall, there was substantial gain in relation to higher order skills such as understanding, analysis and evaluation in the group that had undertaken the fieldwork. This progress they attribute to the catalytic effect of affective learning.

More recent studies have also highlighted the importance of affective gain, both in itself and in terms of enhancing cognitive gain, which suggests the importance of integrating aims in the planning of fieldwork that draw on, and link, both areas of operation. Harvey (1991), for example, working with A-level students at a field study centre in the UK, suggests that the affective gains outweigh cognitive gains from residential fieldwork in the long term by *'motivation...through novelty of milieu, self concept enhancement, productive role modelling and changing students' scripts for learning'* (Harvey, 1991, p.ii). Harvey concedes that this may reflect the observation that much of the fieldwork he observed was focused on testing and demonstrating ideas already learned in the A-level classroom, rather than on *ab initio* field enquiry, which may also reflect the limitations of fieldwork couched in aims that relate only to reinforcement of existing knowledge in the interests of public examination achievement.

Nundy (1998; 1999) supports the idea of the impact of affective gain on cognitive development very strongly through his work on the gains to primary age pupils of fieldwork on river processes. His experimentally-based methodology shows that there is enhanced learning for pupils in terms of constructing learning frameworks and the

development of meaningful learning for those pupils studying by fieldwork rather than classwork, and emphasises this is the result of the interaction of affective and cognitive development. Enhanced cognitive gain is greatest where the development of self-image through the fieldwork experience is also strongest. In an echo of Mackenzie and White's view of the need to plan key episodes and their use within the learning, Nundy suggests that...

> *...residential field course frameworks can (...) lead to enhanced levels of learning outcome. (....). Subjects have to be presented with 'challenges', be involved with group work and 'talk' and have the opportunity to control and re-construct their learning and thinking.* (Nundy, 1999, p.197)

Within this cognitive/affective interaction lie the roots of fieldwork aims that will meet the joint challenges of enhancing geographical learning and making a contribution to the pupil or student's wider personal and intellectual development. That fieldwork contributes to geographical learning is evidenced by the fact that in the UK the observations of the government inspectors of OFSTED (Office for Standard in Education) have indicated clearly that high achievement in geography in schools is linked to a high profile for fieldwork in the curriculum (Smith, 1997). This chapter examines some of the wider opportunities in fieldwork in relation to the development of thinking skills, ICT development and environmental education.

10.3 Teaching and Learning Strategies

Various attempts have been made to categorise broad approaches and strategies used in fieldwork, e.g. (Job, 1996a; Foskett, 1997). Field teaching/field excursion; hypothesis testing; and framework fieldwork are the models discussed in Kent (1996). Foster's (1997) categorisation into: observational; investigative; and enquiry based fieldwork is very similar. Kent et al. (1997) identify two continua of fieldwork activity from the student viewpoint: first between observation and participation; and second between dependency and autonomy (Figure 1). These authors group field courses into broad domains of activities, such as observational fieldwork and participatory fieldwork.

Many authors attempting to make sense of the emerging paradigms of fieldwork have identified a chronological order to the popularity of the approaches. Kent et al. (1997) have attempted to plot the changing approaches to fieldwork in higher education (Figure 2) and most recently Job (1999) has graphically represented fieldwork approaches (Figure 3). In that diagram one axis concerns the extent to which a fieldwork approach relies on measurement and data collection and the degree to which it draws on more qualitative forms of experience. The other axis concerns the starting point and forms of investigations. Did they arise from experience in the field or were they predetermined by someone else or by geographical theory? Job's view is that there is a trend towards

the more sensory (x axis) and open ended (y axis) approach to fieldwork. Many of these changes, he and others argue, come from dissatisfaction with the quantitative approaches which fail to engage children with environments, for 'overemphasis on quantification my be limiting our natural inclination to explore, interpret and draw meaning from the places we visit, in our own way' (Job, 1999, p.2).

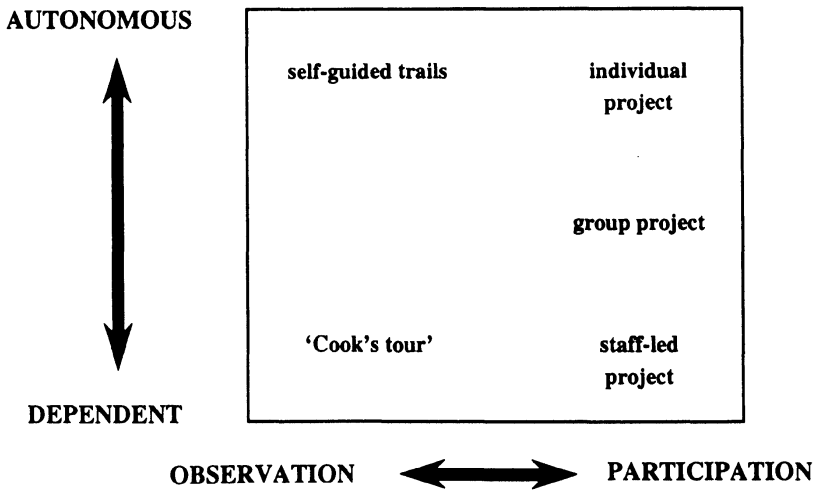

Figure 1. The continua of autonomy and participation in fieldwork. From: Kent et al (1997) Fieldwork in geography teaching: a critical review of the literature and approaches, *Journal of Geography in Higher Education,* Vol 21, No 3.

A seminal source of dissatisfaction with fieldwork arises from Harvey's research (1991) in which he identified a number of tensions emerging between the cognitive and affective dimensions of fieldwork activities undertaken by 16-19 year old students, suggesting a need for greater balance between the two elements. Equally important was Hawkins' (1987) development of a 'process model' for fieldwork in which the:

> *students should, and could, experience a learning process, beginning with techniques designed to heighten their awareness, and going on to equip them with the relevant knowledge and understanding, develop in them a feeling of personal concern and responsibility, and lead them ultimately to participate in social and environmental decision-making... an awareness-to-participation process model is more dynamic and participatory* (Hawkins, 1987, p.218).

Date **Approach**

1950 ***Traditional 'look-see' or 'Cook's tour' field courses***

- observational and descriptive
- 'landscape' – based or centred on 'sight-seeing' visits

1960 to specific sites of interest in geography

- passive student participation

1970 ***'New' Geography – 1960s 'revolution'***

Problem-orientated, project-based fieldwork

- inductive and deductive approaches (positivist) hypothesis generation and testing, data collection and statistical analysis, interpretation and report writing

1980

- detailed scales, often carried out in a small area
- active student participation although often staff-led

1985 ***Enterprise in Higher Education – Transferable skills***

Problem-orientated fieldwork still dominant but introduction of transferable skills element

- project design skills
- organisational skills
- leadership skills
- group skills
- active student participation but emphasis switches from staff-led to student-led projects

Thematic and guided trails

- individual student initiative
- group initiatives

1990 ***Massive growth in student numbers – teaching large classes***

- Field courses incorporate elements of all previous modes of fieldwork
- may commence with 'look-see' perhaps combined with thematic guided walks/trails
- followed by staff-directed, problem-orientated projects
- then student-initiated problem-centred work with added dimension of transferable skills

1997 ***Serious problems of cost of fieldwork to both Departments and students combined with even larger classes***

- the future?
- 'virtual reality' to assist with field courses
- but will 'virtual reality' be any cheaper or ever be as satisfactory?

CUMULTIVE

Figure 2. Changes in approaches to fieldwork in HE geography 1950-1997. *From:* Kent et al (1997) Fieldwork in geography teaching: a critical review of the literature and approaches, *Journal of Geography in Higher Education,* Vol 21, No 3.

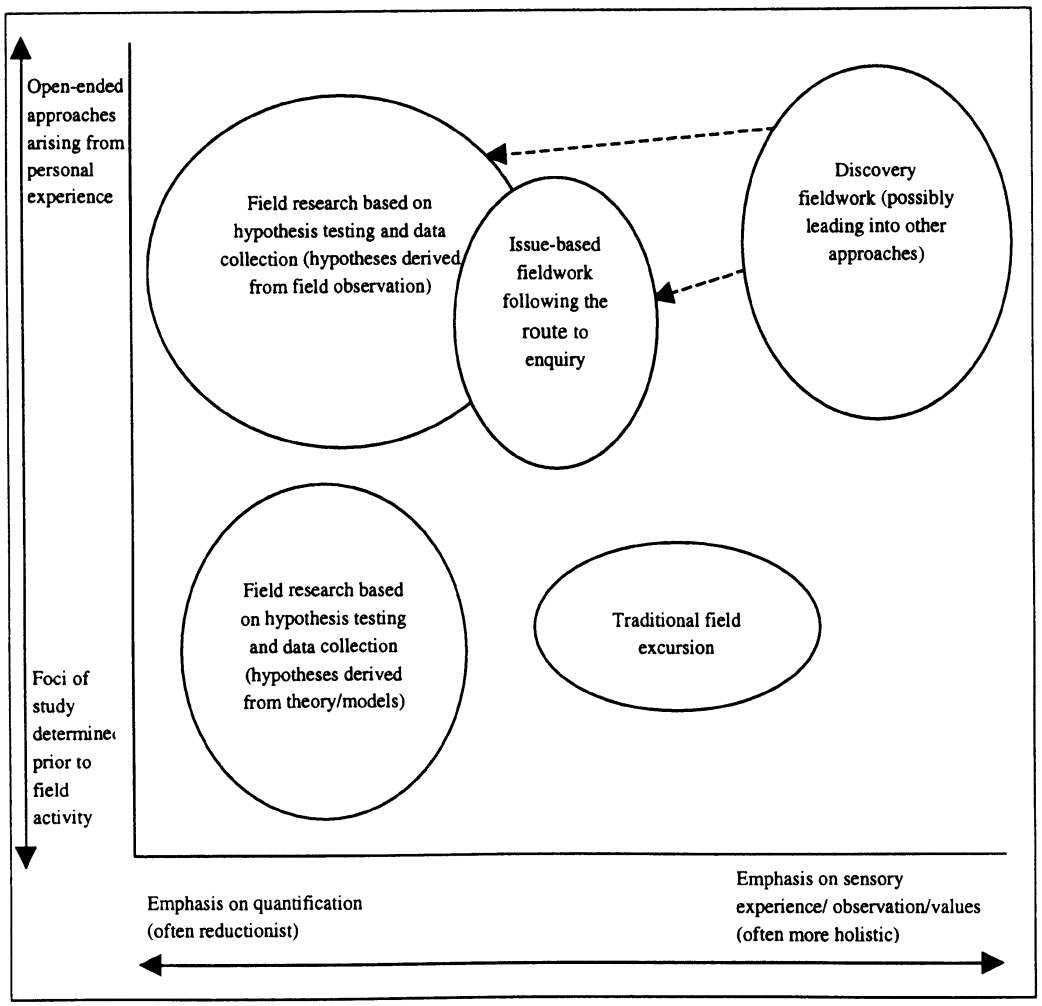

Figure 3. Graphical representation of fieldwork approaches. From: Job, D (1999) New Directions in Geographical Fieldwork. Cambridge University Press.

Progression in fieldwork has not been much discussed nor, arguably, implemented in many instances. Bland et al. (1996) argue that progression must be a key consideration when framing departmental field policies. In particular, progression should be in relation to the skills and techniques used; the level of difficulty of tasks performed; the level of supervision needed; the place and theme studies undertaken; the geographical ideas and concepts studied; and the issues and problems investigated. Helpful guidelines for teachers of 4-19 year olds were produced jointly by the Field Studies Council and the Geographical Association (1999) which show examples and strands for progression in fieldwork (Figure 4), and the idea of progression in enquiry skills and thinking skills is addressed, also, later in this chapter.

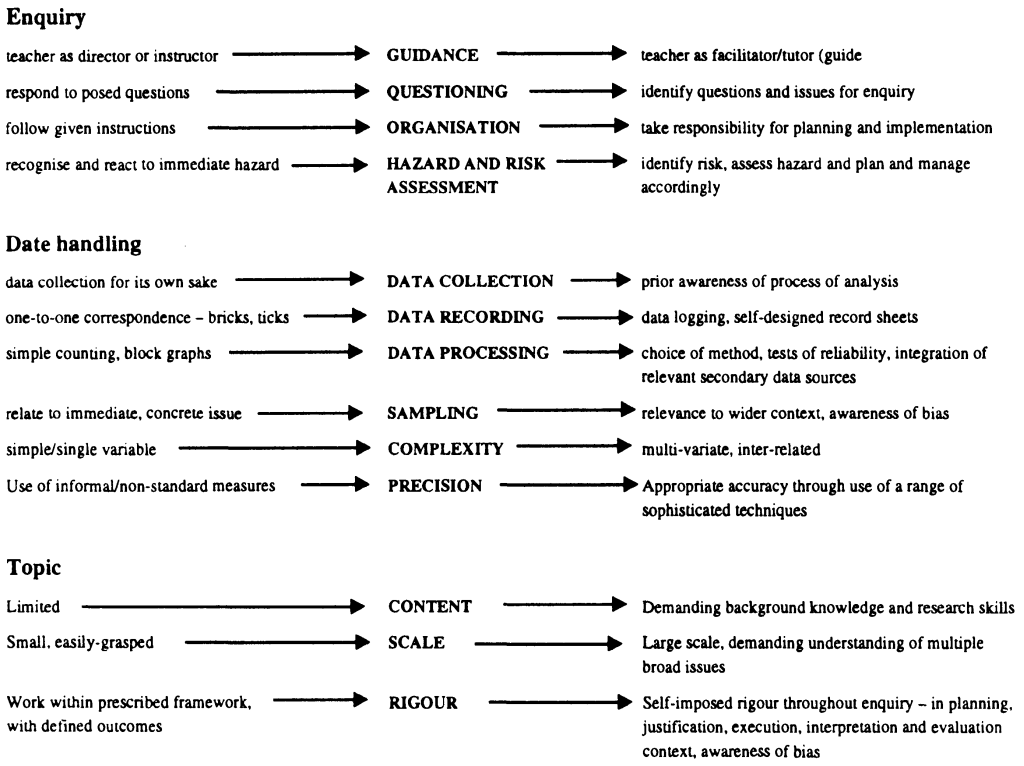

Figure 4. Strands for progression in fieldwork. From: Field Studies Council and the Geographical Association (1999).

Finally, a key future requirement for successful teaching and learning strategies is engaging geography teachers in discussions about, and practical examples of, the latest thinking. In particular, the future lies with recently trained teachers, so the model for residential fieldwork planning, teaching and evaluation discussed by Kent 'has been a highlight of the geography initial teacher training course at the London Institute of Education for several years' (Kent, 1996a). A particular benefit for the beginning teachers has been that they have contributed to a subsequent publication. See for example, Kent, 1996b. Elsewhere Lidstone reinforces that view (Lidstone, 1988). Unfortunately there do not seem to be many similar inservice opportunities for geography teachers to consider and evaluate emerging fieldwork strategies although a successful course entitled 'Fieldwork Strategies for 'A' Level Geography' was held at the Yorkshire Dales Field Centre in 1995.

10.4 Developing Pedagogical Themes in Fieldwork

Of the many aspects of fieldwork into important pedagogical issues within them, we believe that five are of particular significance in ensuring the contribution of fieldwork

to both geography and wider generic fields. These are the domains of enquiry skills; ICT development; thinking skills; values enquiry; and environmental education. Each of these is considered here.

10.4.1 ENQUIRY SKILLS AND FIELDWORK

The development of an enquiry-based approach to learning across the Geography curriculum through the 1980s stimulated its adoption in the context of fieldwork. Hart and Thomas (1986, p 205) believed that the adoption of such an approach "strengthens and enhances the value of fieldwork...and makes it an essential, natural ingredient of all work in geography". In particular they suggested that "meaningful fieldwork...seeks to find answers to pertinent questions about the many ways in which people interact with the various environments in which they live and work" (Hart and Thomas, op cit, p.205).

The concept of enquiry-based learning is that pupils and students learn most effectively by structuring that learning around key questions (Slater, 1982). The approach has been formalised in a number of designated sequences of enquiry, as for example in the 'Route for Geographical Enquiry' developed by the 'Geography 16-19' Project in the UK in the 1980s (see Naish et al., 1987). Roberts (1996), however, has stressed that a number of different approaches to the design of teaching and learning can be adopted which conform to the idea of enquiry-based learning. In particular she distinguishes, 'closed', 'framed' and 'negotiated' styles which represent progressively a move away from teacher controlled learning. A 'closed' approach to learning involves the enquiry questions and the enquiry methodology being generated by the teacher with the 'findings' and knowledge outcomes tightly under the teacher's control. A 'framed approach' involves the teacher providing 'limits' on the nature and format of the investigation, but negotiating some components with pupils. A 'negotiated' approach involves pupils deciding what questions they want to investigate that are of concern and interest to themselves, under guidance from the teacher, whose role is to provide guidance and support as the pupil identifies appropriate data and analytical approaches and reaches his or her own interpretations.

The adoption and encouragement of 'enquiry' within fieldwork is now widespread in the UK, Australia and New Zealand (Foskett, 1997; Richardson, 1998), and is beginning to emerge as an important approach elsewhere, for example in the USA, South Africa, China and Hong Kong (Bednarz, 1999; Wilmot, 1999; Zhang, 1999; Lai, 1999). The use of fieldwork based enquiry by individual students as part of formal summative assessment has also developed strongly, indicating that such individual enquiries provide an appropriate indicator of a student's geographical understanding and skills. To support this latter development the importance of building progression into the use of such enquiry skills as a pupil is underlined by Foskett (1997) and by Bland et al. (1998). Such progression might develop from closed enquiry with younger pupils, through

framed enquiry, to negotiated enquiry with pupils in the upper part of secondary school. Roberts (1996, pp.91-102) provides examples of each type of enquiry, which indicate how progression in the development of enquiry skills might be structured through the geography curriculum:

> *Closed Enquiry* - Teaching shopping hierarchies through fieldwork. The teacher chooses the focus of the fieldwork, and devises a list of hypotheses to be tested and questions to be investigated, which are given to the pupils. The teacher chooses the shopping centres in which the work will be undertaken, designs the pupils' questionnaire and chooses the sample structure and size. The teacher collects in the data, collates it, selects appropriate graphing methods, and gives the pupils instructions on drawing the graphs. The conclusions are devised by the pupils in response to directed questions from the teacher.
>
> *Framed Enquiry* - Choosing a development site for a computer component company. Pupils are divided into groups charged with choosing the best location for a new factory in an urban area. The initial enquiry question is posed by the teacher, and background information on the sites and the company is also provided by the teacher, but the pupils must decide what other questions to ask and what information they must obtain during site visits through fieldwork. The teacher has decided that pupils must use ratings of different criteria to make their decision, but pupils must choose the criteria and the rating scale. Pupils present their findings to the whole class, who decide as a whole which site to choose.
>
> *Negotiated Enquiry* - Choosing an Individual Enquiry at A-level. An individual student must choose a topic for study, generate questions and a methodology, then analyse and interpret the data. The teacher, in discussion, listens to the range of possible ideas and, by questioning, helps the student frame appropriate enquiry questions. The student chooses to consider the issue of the construction of a new supermarket near to his home.

The development from closed to negotiated enquiry may also, of course, encompass increasing challenge in relation to the types of fieldwork techniques that can be applied. Furthermore, the skills being developed are generic, and may be applied across the geography curriculum and be transferred to other curriculum areas.

10.4.2. FIELDWORK AND ICT DEVELOPMENT

Although still highly variable in its use in schools, the growing centrality of Information and Communications Technology (ICT) in schools is inevitable and its place in fieldwork will be very important.

Probably the first published and specific advice to teachers of geography keen to incorporate ICT in their fieldwork, was the work of Bilham-Boult (1988). In his introduction, he pointed out that 'the application of computers to fieldwork is still very much in its infancy. Its full potential has yet to be explored, and there exists an enormous variation in practice'. This comment is probably still true today!

More recently (Figure 5), David Hassell (1996) has written about the opportunities for using ICT to support coursework which often equates with fieldwork. As he argues, 'coursework provides an ideal place to enable pupils to use the IT skills they will be building through their school career to improve their geography work', (Hassell, 1996). Not only is geography enhanced by such technology, but so too are the ICT skills required by National Curriculum ICT, GCSE and Post-16 courses (see Nowicki, 1999).

Further research, such as that by Lawler (1986) who focused on ways in which the use of computers helped a group of GCSE children to analyse their fieldwork data, is clearly needed. Such research may well confirm that effectively deployed, such technology 'provides for rapid handling of data which enables the emphasis to be on the enquiry process, the in-field skills and the interpretation of findings, and not on mechanical data processing' (Foskett, 1997).

10.4.3 FIELDWORK AND THE DEVELOPMENT OF THINKING SKILLS

Recent research in science education has emphasised the role of teaching using tasks that challenge children to think and problem solve in enhancing pupils' 'cognitive gain'. The Cognitive Acceleration in Science Education (CASE) Project (Adey and Shayer, 1994) has developed activities which challenge pupils to question, theorise and hypothesise, to work beyond simple 'knowing' and 'understanding' in areas of thinking that include analysis, evaluation and problem solving. Adey and Shayer suggest that such thinking skills enhance achievement in science, but also raise standards more broadly by equipping children with transferable skills.

'Thinking skills' include a wide range of 'skills' such as 'choosing', 'deducing', and 'applying logical thinking'. At a simple level we can distinguish 'creative skills', which are constructive and involve drawing information and ideas and imagination together to generate a new perspective; and 'critical skills', which are deconstructive and involve reducing ideas to their component parts. Sternberg's (1985) 'triarchic classification' of thinking skills distinguishes three components of thinking skills. Knowledge components involve inputs to the mind – 'seeing', 'hearing', 'scanning', 'analysing'. Performance components involve outputs from the mind following intellectual processing that the child has undertaken, and include 'remembering', 'reflecting' and 'decision-making'. Metacomponents relate to the control of thinking and the notion of

Software/hardware	One potential application
Wordprocessing	In any enquiry to support pupils' intended writing, where they can draft and redraft reports.
Drawing, painting and DTP packages	Tools for illustration in any type of material, e.g. combing text and images to provide a high quality method for designing survey sheets.
Spreadsheets	To provide a tool for evaluating and modelling a range of decisions, e.g. evaluating routes in an enquiry on the location of a new bypass. Using a weighting scheme the spreadsheet provides opportunities to evaluate many different options effectively.
Databases	To provide access to data, explore patterns and relationships and display results effectively. For instance, in an enquiry on tourism a database of questionnaire results would enable the pupils to explore links between gender, age and holiday location.
CD-ROM	To provide access to a wide range of information and deepen understanding of spatial relationships, e.g. a census CD-ROM can support an enquiry into the contention that quality of life can be low in urban and rural areas.
Mapping and geographic information systems (GIS) software	To explore spatial relationships by querying a database and displaying the results spatially. For instance, a GIS can support investigations into the link between the economic and social factors and regional inqualities in India.
Portables in the field	Using portables in the field enables direct entry of information from a questionnaire or observations. This enables initial analysis to determine whether further measurements or questionnaires need to be carried out, e.g. checking that mistakes have not been made in the collection of river data.
Data logging	To record data accurately over a period, which could not be achieved manually, e.g. to explore the link between local facility use and daily weather. Data from automatic weather stations can be exported to a spreadsheet or database for comparison and analysis.
Remote sensing	To provide access to richer images of an area which can illustrate change over time and be manipulated. For instance imagery of the local area can be used to support an enquiry into the actual and potential loss of urban green space.
Internet	The internet can provide access to a wealth of resources. For example, people's views and information on issues related to the Kobe earthquake can be obtained when investigating the impact of physical processes.

Figure 5. Opportunities for using IT to support coursework. From: Hassell, D (1996) Using IT in coursework, Teaching Geography, April, Vol 21, No 2.

'metacognition' - in simple terms, 'thinking about thinking', and include skills such as 'planning' and 'evaluating'.

Important within the development of thinking skills is the idea of 'transfer'. Transfer is essentially the extent to which current learning enhances subsequent learning, and can be seen in two ways - as 'lateral transfer' in which the ideas and skills are used in a different but no more challenging situation, and 'vertical transfer' in which they are used in a more challenging or complex situation. Leat (1998) describes this process of transfer as 'bridging' and emphasises that it provides a 'multiplier effect' in the pupils learning.

The development of thinking skills has also been applied in geographical education by the 'Thinking Through Geography' Project (Leat, 1998). This has developed approaches using a wide range of strategies, each focusing on a generic concept important within geography but having great utility for transfer to other arenas, such as 'classification', 'cause and effect', and 'systems', using teaching strategies that are innovative and varied. By using such 'thinking activities' pupils start to develop analytical and reasoning skills which support 'transfer', metacognition, and increasingly independent learning through questioning and thinking.

Foskett (1999) has suggested that the potential benefits of a thinking skills approach can be subject to a further multiplier effect if conducted through fieldwork. Much of the empirical research into fieldwork in schools and colleges has emphasised the cognitive and affective gain that it generates for students. Mackenzie and White (1982), Kern and Carpenter (1986), Harvey (1991) and Nundy (1998; 1999) all suggest that fieldwork stimulates the enhancement of higher order thinking skills, and that this gain is further enhanced by the interaction of affective and cognitive development processes. Foskett (1999) shows how such developments might contribute to each area of Sternberg's triarchic classification.

Firstly, all fieldwork is based on observation, recording and data collection and the process of 'monitoring' and evaluating that data. The thinking skills involved in this process exemplify Sternberg's 'knowledge' components. Secondly, although 'performance' has traditionally been restricted in fieldwork to data presentation, recent growth in the use of problem-solving and decision-making in relation to issue-based fieldwork has emphasised the role of performance. The role of 'talk' in developing such 'performance thinking skills' is stressed by Adey and Shayer (1994), Nundy (1997) and Leat (1998). Thirdly, the notion of building in progression in fieldwork experience for pupils such that they develop the skills of 'independent enquiry' requires the development of metacognition skills through the planning, reviewing, evaluating and reflection skills which such enquiry necessitates.

Beyond Sternberg's three components of thinking skills lies the notion of transfer, which is evidence of high level thinking skills. In fieldwork the opportunity for classroom to field to classroom transfer of knowledge and ideas is large, whether through testing theories from classwork by hypothesis testing or by generating theories from field observation. Both vertical and lateral transfer can be integrated into planning fieldwork enquiry by emphasising 'transfer' issues in the objectives for the work.

The potential of fieldwork for enhancing thinking skills is clearly considerable - and indeed, it has always done so, albeit without the explicit intent of teachers. Figure 6 exemplifies the ways in which thinking skills can be planned into fieldwork. This represents a starting point for planning, for each stage will require careful management to optimise the learning processes that enhance cognitive gain, such as groupwork or pupil talk, while ensuring appropriate affective domain aims are integrated to reinforce cognitive gain.

Stage	Thinking Skills Processes	Fieldwork Planning Process	Example
1.	Lateral transfer from classwork	Developing enquiry questions or setting up hypotheses	Set up 'enquiry' into impact of tourism on e.g. a local beauty spot
2.	Knowledge components	Reflective and critical data collection	Consider litter survey, erosion of footpath measures, visitor interviews as data methods. Monitor data as collected
3.	Performance Components	Decision-making, Problem- solving, Hypothesising	Present alternative models for managing tourism
4.	Metacomponents	Evaluating group/individual knowledge/performance components	Evaluate data collection and evaluate group/individual role
5.	Transfer - Lateral	Integration of findings and principles into classwork or other subject areas	Re-visit environmental management topic and apply findings to different cases
6.	Transfer - Vertical	Construction of higher levels of model	Draw out big concepts of 'cause and refinement. Linkage to 'big concepts', 'effect', 'planning', 'decision-making' etc

Figure 6. Integrating thinking skills development into fieldwork planning

10.4.4 FIELDWORK AND VALUES ENQUIRY

Wondering at and experiencing the environment through fieldwork is an established tradition which has been somewhat neglected of late. This perhaps explains a good deal of the criticism by Hawkins (1987), Harvey (1991) and Job (1996 and 1999). The specific suggestions that have been made to offset this 'affective-deficit' include an awareness-to-participation process model, (Hawkins, 1987); raising sensory awareness; Haiku poetry; making connections through literature and the use of stimulus cards (Job, 1999). Owen-Jones' (1987) research work specifically brought together affective and

cognitive learning in a strategy which successfully involved values education through fieldwork set in Kew Gardens.

The Earth Education movement in the USA has informed such recent UK work. For instance,

> *We hoped to establish this sense of place forever in their understandings, or perhaps more accurately in their feelings, for we wanted it to become embedded inside them, where it would be a continuous source of awareness about who and where they were. Second, like a friendly wizard, we wanted to convey to them a feeling for life's wonderous mysteries in which they are bound up with every other living thing on earth. And we hoped that this recognition of miraculous inter-relationships would become a mental touchstone against which they could forever check their actions.* (Van Matre, 1989, p.47)

De facto most values education through fieldwork has recently taken place through issues based enquiries at KS3 and KS4 and particularly in 'A' level fieldwork influenced by the Geography 16-19 Project Route for Enquiry which has a clear 'values enquiry' strand and ends up with students making personal evaluations, judgements and responses.

10.4.5 FIELDWORK AND ENVIRONMENTAL EDUCATION THROUGH GEOGRAPHY

The contribution of fieldwork to environmental education has been recognised by both education policy makers (NCC,1990) and researchers (Fien, 1993; Job,1996). The Belgrade Charter of 1976, promoting environmental education in its signatory countries, contains the origins of the notion that environmental education comprises education *about* the environment, education *through* the environment, and education *for* the environment. Despite this distinction, Fien (1993) believes that the purpose of all environmental education is education *for* the environment, with a primary aim of developing in individuals a critical, analytical perspective on the environment and environmental issues with a view to the stimulation of fundamental change in people's interactions with the environment. Hence, a key aim in fieldwork will be the raising of awareness about environmental issues and conflicts and the encouragement of discussion and exploration of environmental attitudes and values.

Environmental education is essentially a politically and ideologically framed process reflecting the views of curriculum planners. While all environmental education can be underpinned by fieldwork in school and college, all approaches and strategies require careful reflection on the nature and purpose of the environmental education which is being promoted. Fieldwork that involves the choosing of least environmental impact

developments, for example, or which emphasises rational, scientific interpretations of environmental processes, may be interpreted as promoting a strongly technocentric perspective, while fieldwork based on perceptions and values of environment, such as the Earth Education approach of Van Matre (1989), may be interpreted as promoting strongly ecocentric views.

It is also clear that all fieldwork is environmental education, whether the primary and explicit aims of the work express this or not. The importance of the hidden curriculum within the school is often explicitly recognised, yet its existence in the curriculum outside the school buildings is just as significant. It is in the attitudes and values of the implicit environmental curriculum that much of the real learning *for* the environment occurs, and the existence of fieldwork (or not), the approaches adopted and the ideologies these represent convey much of the learning pupils make in this arena. Where the first hand environmental experience of pupils is only delivered through geography fieldwork, auditing this experience against the explicit and implicit aims of environmental education would seem to be an essential part of fieldwork planning.

10.5 Teaching Through Fieldwork – A Perspective on the Future

As a resource intensive element of the curriculum, fieldwork will always need to be justified by those committed to its importance in Geography. Perceptions from outside Geography that fieldwork is simply an affective experience, or worse still, just a mere amusement, need continuous challenge. This process requires geography educators to reflect on the value of fieldwork and rethink the strategies we use in the field, as Job (1999) has begun to do. At the political level, we need also to lobby strongly for the inclusion of fieldwork as a required element in centrally-dictated geography curricula, and for fieldwork skills to be recognised as an important component of the features of geographical literacy at all levels. In this respect, the inclusion of fieldwork as a higher profile component of a revised International Charter on Geographical Education (IGU, 1992) would give a strong lead in this direction. We also need to ensure that fieldwork has a 'futures perspective' looking to brighter, more just, sustainable and equitable futures. See Hicks, (1993).

Reflection and research on the nature of learning through fieldwork and the ways of optimising its impact is essential, too, for 'effective learning cannot be expected just because we take students into the field' (Lonergan and Anderson, 1988, p.70). Little objective research has been undertaken on fieldwork as a learning process, either in schools or in higher education, and we often struggle to provide evidence to support our beliefs about the benefits of fieldwork. The research that has been undertaken (for example, Mackenzie and White, 1982; Nundy, 1998) provides strong supporting evidence, but leaves many research questions completely unaddressed. Though piecemeal, there is the beginnings of a research literature and agenda as witnessed by a

number of recent MA dissertations, completed for the MA Geography in Education course at the Institute of Education. See for example those by Crouch, (1991); Wu, (1992); Rynne, (1995); and Macintosh, (1998).

A significant threat to real fieldwork that is emerging rapidly in higher education is the development of 'virtual fieldwork', and the explosion of ICT means that such notions will soon emerge beyond their current limited development in schools. The advantages of virtual fieldwork in organisational, logistical, cost and safety terms are obvious, and such approaches enable highly focused learning to occur – examples and proposals may be found on the web at www.geog.le.ac.uk/vfc/about/background.html. At best, though we believe such approaches can only support real fieldwork rather than replacing it, for the affective dimensions that contribute so strongly to learning in this domain are largely absent from the virtual field scene.

The place of fieldwork in the school of the future is not assured, and the case needs to be remade with each curriculum review from school to national scales. Its potential contribution to geographical understanding, and its generic contribution to the development of enquiry skills, ICT, values enquiry and environmental education support the argument very strongly. We believe that:

> *With effective planning and management and a commitment to the educational and personal benefits of fieldwork, geography teachers can ensure that it remains as one of the most significant learning experiences that pupils have during their school careers.* (Foskett, 1997, p.200)

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11. THE CONTRIBUTION OF FIELDWORK TO LIFE-LONG LEARNING

ROD GERBER

11.1 Introduction

Geographers have advocated long and hard about the inherent and fundamental nature of wandering around in the field to collect first-hand data about the spatial distributions of phenomena in different environments, eg. the distribution of elephants in the African game parks or the location of tourist resorts along the east coast of Australia or the distribution of bison on the high plains of the United States of America. Early statements that emphasised the centrality of fieldwork to geography included Wise (1966:69) who stated:

> *A student will learn more effectively by going out and finding for himself the nature of the physical and human phenomena apparent in an area and the inter-relationships between them.*

Wheeler (1970:1) took the earlier advice from Herbertson from 1913 who wrote:

> *If geography did nothing but teach a child to see, know and love his own district it would be an inestimably valuable element in education. But it can do more. It can lead him to the conception of varieties of the home district and from that to appreciate in part some of the outstanding characteristics of different types of district.*

Graves (1965:36-74) extended this view to focus on the purpose of direct observation through fieldwork as an essential component of geographical education and to promote the mental development of young minds. Everson (1969) also extended this view by demonstrating how fieldwork in British school education could be organised better using a hypothesis-testing approach. These were seminal foci for placing fieldwork centrally in the education of younger people.

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 195-210.

Policy documents extolled the importance of fieldwork for enabling geography to become a powerful medium for promoting the education of people, eg. the *International Charter on Geographical Education* (IGU.CGE, 1992:5) explicitly called for the development and practise of "such methods as field observation and mapping, interviewing people, interpreting secondary resources and applying statistics". These are essential aspects of doing fieldwork successfully in geographical education. Similarly, the promotion of such values as "appreciation for the beauty of the physical world, on the one hand, and of the different living conditions of people, on the other" (p.6) can be best achieved through first hand field experiences.

Reference books and journals have been extensive and continual in their advocacy of fieldwork. The British journal *Teaching Geography* has offered many feature articles and demonstrations on the application of fieldwork in school geography. Some of these features include the following: *An enquiry approach to geography fieldwork* (Barratt, Burgess and Cass, 1997: 77-81); *Fieldwork on parade* (Walford, 1995:112-118), *A question of fieldwork* (McPartland and Harvey, 1987: 162-164), and *IT and fieldwork* (Lucas, 1993: 38-39). Key reference books published by the Geographical Association have each contained at least one chapter on fieldwork to enhance the professional development of geography teachers. The *Handbook of Primary Geography* (Carter, 1998) contains the following headings in its chapter (Richardson, 1998: 181-195)– the organisation of fieldwork, fieldwork policy, planning a visit: health and safety issues, health and safety and risk assessment, progression in fieldwork, work sheets or activity sheets, and resources for fieldwork. Similarly, in the *Geography Teachers' Handbook* (Bailey and Fox, 1996), Bland et al. (1996: 165-175) used headings that included: planning a field trip, progression in fieldwork, teaching and learning styles, the fieldwork audit and policy and further reading. These headings do certainly give a flavour to the pedagogic aspects involved in fieldwork that have been promoted widely in geography classrooms in many countries. They are epitomised by the introductory paragraph to Bland et al.'s chapter which states:

> *Geography without fieldwork is like science without experiments: the 'field' is the geographer's laboratory where young people experience at first hand landscapes, places, people and issues, and where they can learn and practice geographical skills in a real environment. Above all, fieldwork is enjoyable. A field trip is a working holiday: a refreshing change from the predictable routines of the school and the 'virtual' or 'simulated' reality of the book, slide and video. It provides an opportunity for pupils to relate in new ways to each other and to their teachers, and so break some of the patterns of behaviour that become fixed in the school*

> *environment. It is an adventure, and like all adventures, can be alarming as well as fun.* (p.165)

At university level, geographers have made a comprehensive case for the value of fieldwork in higher education. For example, in the *Journal of Geography in Higher Education,* May (1999) claims that fieldwork continues to represent one of the most appropriate forms by which student understanding of a number of key concerns of social and cultural geography may be developed; Light and Phinnemore (1998) argue the case for teaching about the concept of *transition* in European settings through fieldwork; and Warburton and Higgitt (1997) demonstrate how information technology, especially through the use of a GIS, may be used to enhance the preparation phase for fieldwork in geography.

As powerful as these statements and publications may be for promoting fieldwork they are limited by being focused on the world of formal education in school and university geography. Formal education is but one modest component of people's life-long education. As the author has shown elsewhere, adults learn throughout their lives in a variety of ways that include: learning by making mistakes, correcting them and never making the same mistake again; taking risks; through reading manuals; through asking others for advice; by teaching others; by acting as an advocate for colleagues; through lateral thinking; and by observing other people doing a task and repeating it until one can do it successfully. (Gerber,1998)

11.2 Fieldwork and Life Experience

The concept of fieldwork as one of life's experiences should not be underestimated. Within the world of cognition and learning the concept of direct experience of environment has been an integral part of people's learning to live with their life-worlds. A range of publications have highlighted the importance of such experiences. For example, an earlier publication by Hart (1979) placed a focus on the world of children and their understanding of places that they had experienced. This type of work has been placed in a more modern context by Robertson (1999) in her work on children's identity building based on their experience of private and public places. Invariably, some form of fieldwork has been involved in these experiences. It is probable that more of the fieldwork was completed informally through the children moving around in their own environments, together with their imagined movements around other environments that they cannot experience directly.

In Finland (Rikkinen, 1999), this experience of one's environment was investigated in the Living Environment Project. Here, the researcher explored how children interacted with

and demonstrated understanding of their local region. This was a research study that used fieldwork as the basis for tapping children's experiences. While the main results of the study demonstrated that there are clear connections between the visual acuity of children and their level of geographical perception of the world, the direct use of the field for the research enabled the life experiences of the children to be investigated in a real-world situation.

At different levels of formal education the importance of doing fieldwork to develop a stronger understanding of one's world has been written about quite extensively. At the primary school level, for example, Catling (1994) provided a comprehensive statement on the planning of activities that involve doing fieldwork. While the emphasis was directly on planning for the fieldwork, the article provided a strong rationale for fieldwork being the basis for learning about one's environment in primary schools. Harvey (1991) completed a detailed case study to demonstrate how powerful fieldwork is in older secondary students' development of key geographical concepts and values. Jenkins (1997), writing for students in higher education, introduces the concept of fieldwork being an important way of learning for an increased range of students in higher education.

However, life's experiences are much broader than doing fieldwork in formal education or exploring the local environment during one's childhood. What is surprising to some people is the extent to which they can identify the use of fieldwork in different facets of their lives. Without wanting to be comprehensive on this matter, it is possible to think of people using fieldwork in leisure or recreational activities, as part of formal and informal research, as an integral part of doing one's work, acting as a concerned citizen and caring for one's environment. The purpose of the next four sections is to tease out the ways by which fieldwork can be used in our wider life experiences to improve our contribution to developing a more effective world.

11.3 Informal Fieldwork in One's Life

The curiosity of human beings to cause them to wander around in their physical and social environments is a quality that should not be underestimated. It is this quality that has formed the basis of the environmental perception movement. Classic books such as Lynch's (1960) *Image of the city* and Tuan's (1974) *Topophilia: A Study of Environmental Perception, Attitudes and Values* serve to remind us that people's direct experience with their environments have led to serious theorising about the way that people understand the environments in which they live. One very important task for geographers is to evangelise to the wider society the power of fieldwork in everyday living and to suggest ways by which

our lives can be improved through effective fieldwork strategies. This can be done by demonstrating how useful fieldwork is in our everyday lives.

A powerful way to commence this demonstration is to take the provocative publication by Nabham and Trimble (1994) entitled *The Geography of Childhood: Why Children need Wild Places* and illustrate how children use their own form of fieldwork to develop their own understanding of their environment. They declare:

> To counter the historic trend toward the loss of wildness where children play, it is clear that we need to find ways to let children roam beyond the pavement, to gain access to vegetation and earth that allows them to tunnel, climb, or even fall. And because formal playgrounds are the only outdoors that many children experience anymore, should we be paying more attention to planting, and less to building on them? (p. 9)

When children are engaging in the exploration of wild places or any place in their life-world they are actively doing informal fieldwork. Consciously or sub-consciously these young and curious minds are using fieldwork principles to different degrees of success in exploring and making sense of their physical and social environments. They may move around the environment to collect specimens from the natural vegetation, rocks from a stream bed, or even take photographs of features or wildlife in the area. In making their ways around the chosen environment, children may take conscious decisions about which path to follow and which one to avoid. Upon returning from their explorations the more vocal children will tell their friends or parents some of the special things that attracted their attention while they were in this world. They are engaged in landscape or environmental description and interpretation.

Quite often the children may not have initiated the exploration of their environment. Instead it may have come from parents taking their children on a picnic and an afternoon walk in a scenic part of the accessible region. The roles of the parents are not to act as child minders, but rather to act as trail blazers in another "new" environment in which they initially escort their children, and later they co-explore the environment with other members of their family. As Nabham and Trimble (p.31) state:

> *As parents, we can take our children with us to the land. We can be there with them as they climb on rocks, play in streams and waves, dig in the rich soil of woods and gardens, putter and learn. Here, on the land, we learn from each other. Here, our children's journey begins.*

Adventures in one's environment in later life often grow from the variety of childhood environmental experiences. It is as if the fieldwork that has been developed vicariously in a person's childhood years is utilised and sometimes extended in one's adult years. For some people in the urbanised world in which we live, this love of interacting with one's environment translates into living in a rural setting and commuting to work in an urban area. For others it means that adults spend their free time exploring environments on bicycles or on horseback or on foot during a hiking activity. All of these activities involve various usage of fieldwork techniques to both explore and to interpret the environment as it is being enjoyed.

This notion of leisure experience in one's environment may be transferred to organised recreational activities. The sport of orienteering is classic example of using fieldwork skills to compete successfully in an organisational recreational activity. As people of all ages compete against themselves, or sometimes against other people in their age group, to find their way around a pre-determined path or route they are interpreting a topographic map, associating landforms that are represented on a map with those as they appear on the Earth's surface, and calculating distances on the map that they will follow in moving from marker to marker along the orienteering route. These people are using fieldwork skills as the essential tools for them to complete the orienteering task in an acceptable manner.

No attempt is made here to enumerate the range of informal settings in which fieldwork techniques and skills are used. Rather, the examples are included so that the reader can appreciate the pervasive nature of fieldwork in human behaviour that is associated with using our physical and social world. This is exemplified by taking the concept of fieldwork and linking it to the world of work, apparently a most unlikely place in which to think of its relevance.

The issue of gender when dealing with fieldwork in the informal aspects of our lives is one that should not be overlooked because there is ample evidence that in growing up boys tend to be given greater scope to explore their environment unsupervised than girls are. Such explorations involve searching through the environment for variations in wildlife, landforms, vegetation and evidence of occupancy by people, flora and fauna. Hart, in his study of a New England (USA) town in the 1970s (Hart, 1979) found that boys were allowed to range more than twice the distance from their homes as girls were. As Trimble (Nabham and Trimble, 1994: 71) notes:

Genetics and culture interweave as each gender comes to terms with the environment. Boys may start out with a small genetic edge in visual sensitivity. Girls generally acquire language more quickly, but boys are meanwhile practising and honing their manual skills, physically manipulating their world far more than girls. Most boys catch up to girls verbally, but once children reach adolescence, American girls typically never catch up to boys in spatial competence (perceptions of the relationships of objects that determine our understanding of place, as tested by working with models and maps). Remember, though, that we build all our cultural biases into experimental design: in Eskimo culture, both boys and girls accompany their fathers on extensive hunting trips, and both sexes perform equally well on spatial tests.

11.4 Fieldwork in One's Work

Relating the concept of fieldwork to the concept of work is not such a strange idea. In market research companies the idea of going out into the wider community to collect data through face-to-face interviews is termed doing fieldwork. Social researchers who employ enthnographic research methodologies engage in different social settings, interact with and observe human activity in doing research fieldwork. However, the spatially oriented fieldwork that geographers mostly engage in may be seen to be different to those examples that have just been described for it involves the use of parts of actual environments to achieve the goal of one's work. Here, the intention is to use the techniques that we develop as geographers to improve our performance as workers in our chosen careers.

One way into understanding how fieldwork is becoming a more important component in some people's work is to think of the different promotional materials that have been developed to promote geography as a career. Leaving aside those people who are professional geographers in universities and some government departments, eg. the land survey department, there are a surprising number of jobs that rely heavily on the use of fieldwork for their success.

These jobs differ according to whether the fieldwork techniques and skills are being used in a strongly technical and professional sense or they are being applied in the practice of one's work. The use of fieldwork techniques and skills in a professional sense is characterised by surveyors and associates who use distinctive field skills to chart the terrain and location of say a new road through an area. The use of maps and equipment to locate the route for the new road are central to the professional operation of the survey team. A professional who the Americans would call a business geographer is actively involved in the location and

planning of such economic ventures as regional shopping centres. This professional person operates by working with survey data on modelling potential shopping trends in an area and then taking the results of these data to the field to confirm that people would patronise the shopping centre if it were built in their area.

People who practise fieldwork in an applied sense in their work do so intentionally but on a less than focused manner. Take for example the ranch hand who rides a horse, drives a motor cycle or flies a helicopter to muster cattle on his or her property. The cattle are dispersed widely around the ranch and it requires the careful use of basic field techniques and skills to complete the task of mustering in differing terrain. The plotting of routes to take the cattle during the muster to ensure that both parties (the ranch hand and the cattle) make it safely back to the cattle yards becomes an accepted task during the muster. The use of field skills such as knowing direction by the location of the sun and being able to estimate distance are taken for granted by the people doing the muster. However, they are essential for the muster to be conducted successfully. At another level, similar fieldwork tasks can be ascribed to the skipper of a fishing trawler who is operating on the continental shelf of a continental land mass when he searches for a catch of fish. The skipper must know how to find his way around the watery environment using directional skills and calculation of distances to be travelled against the amount of fuel that he has on board his boat.

A golf professional also makes use of different fieldwork skills in playing a golf tournament. The golfers usually become very good judges of the slope of land areas that are associated with each hole both on the fairway and on the green. They are adept at working out straight line and angular distances between the tee and the green. Working out techniques to extricate themselves from sand traps, water hazards and vegetation hazards often involve detailed interpretation of landscape. Not only do the golfers sometimes have to struggle out of rough terrain to complete their play, but also they have to become astute applied fieldworkers if they are to be successful.

These examples merely touch the tip of the extent to which fieldwork is integral in people doing their work successfully. However, they do indicate that more occurrences of using fieldwork in one's work are prevalent in our society.

11.5 Keeping in Touch with the Environment

How do people keep in touch with their environment? When they are children they often explore it in a close-up-and-personal manner. However, it is claimed by Nabham and Trimble (1994) among others that this form of environmental experience that invariably

involves the use of fieldwork is becoming less common as more and more children are "protected" from the wild side of their environments. When people get older they tend to experience their environments through leisure activities and especially through various forms of tourism.

The more dedicated environmentalists who belong to conservation groups practise field activities very seriously as they learn more about different fragile settings and as they seek to protect them through different forms of protest. For these people and for the dedicated environmentalists continuous leisure experiences through bushwalking, hiking and even mountain biking over slick rock areas in Utah, serve as the means for maintaining people's links with nature. Their "communing with nature" becomes their way of life and they develop very strong positive values to the natural environment.

Not quite so dedicated about being at one with their environment, but are none the less still at home with the environment are the many people who engage in recreational pursuits or those in different countries who own and operate summer cottages which become the base in the country for the family to holiday during the summer vacation. This is especially important in many northern European countries. These recreative experiences that focus on the personal interaction with environments mean that field skills are employed directly in recreational activities such as orienteering or they are using variously during walks through the environment in which people develop a powerful appreciation of the majesty and grandeur of particular environments, eg. mountain lakes, and a commitment to sustain such environments for future generations to enjoy as well.

The least energetic of the ways by which people around the world keep in touch with their environments is through the burgeoning tourist industry. Here, through operator -organised or self-organised tourist activities groups of people journey near and far to appreciate different qualities of environments for a few days or longer. The attractions in the environment may consist of: distinctive landforms, unusual cultural features, eg. cliff dwellings; attractive environmental patterns, eg. river patterns and cropping patterns; and massive features, eg. the sandstone landscapes in Arches National Park in Utah (USA). This form of environmental voyeurism may be regarded as rather superficial when compared to those of the more dedicated environmentalists. However, it does allow many hundreds of thousands of people to use basic fieldwork skills in appreciating their environments. Typically, the frequency with which people practise these skills varies greatly depending on their access to environments and the availability of time to pursue these interests. Such is the size of the tourist industry around the world that it is a safe assertion to make that the growth in presenting tourist attractions to the public and the visitations to these attractions by

increasing numbers of people mean that more and more people are taking their environments to heart. They may even be more concerned about their own environment as a result of these tourist experiences. Definitely, they are making use of field skills to do so.

11.6 Cyber Fieldwork

Sadly or fortunately, depending on how one looks at the issue, the growth in tourism is still not sufficient to promote fieldwork and environmentalism in today's technological society. Instead, more and more children and adults are viewing environments through some form of communications technology. If they are manoeuvring around such environments, it is often by some artificial means. This is a form of cyber fieldwork. Once, geographers talked about understanding the environment through secondary sources or vicarious means, meaning that they observed the environment through some kind of filter, eg. a photograph, a map or some statistics, because it was impossible for them to see the environment first hand. Now, with increasingly sophisticated communications technology people can work with data supplied from any number of sources and conduct their own interpretation of the spatial information that is presented. Computing software now makes it possible to analyse spatial data through Geographical Information Systems thereby engaging in a form of cyber fieldwork analyses.

Such fieldwork can be conducted in the forms of structured and non-directed learning activities. In the structured learning experiences the tasks are organised for the learners and they progress through a menu of instructions to gather data, record it and then analyse it with the assistance of the computer software. For example, this may occur in the development of simple field skills such as finding direction, measuring distance and calculating areas, using software that has been designed for use in Primary or Elementary schools. Non-directive field activities are found in software packages in which the learner or user has the opportunity to say solve a problem, eg. where to locate the shopping centre?, and can use the tools provided in the software to choose ways to complete the decision making experience. The learner uses different field skills in working with the software and the data that it includes to make geographical decisions.

In leisure activities, cyber field tasks have been incorporated into software packages to add real life adventure into the experience. Field skills can be used informally as younger learners try to find their way through an environment that is the working area on the computer screen. They will use directional skills, grid referencing skills and scale to assist them to locate and describe specific places on the computer screen. Children find it to be fun to use these basic field skills in their leisure activities of an imaginary kind.

Geographical Information Systems have been mentioned in the paragraph above. While some people would argue that people who use them only have to understand the geography to use them to solve geographical problems, I would prefer to say that these complex sources of spatial data allow people to use geographical and field skills to make the best use of their data. Good understanding of geographical concepts and theories is important for interpreting the data. However, the adept use of field techniques for representing different forms of geographical data from the GIS is essential if the data are used fully. For example, understanding how graphic representations of data are presented best in map, diagram or graph forms is essential to present the results of interrogations of the data in the GIS. Gradually these large banks of data are being transformed into workable packages for school children. They represent one current example of the many different forms of software that will be available in the coming years to practise cyber fieldwork.

11.7 Fieldwork Leadership

Who has the role and the duty to become a leader in fieldwork? Hopefully, the range of contexts for fieldwork that have been mentioned above serve as a reminder that fieldwork is not something that is restricted to the formal education situation. It is a much more pervasive activity that may be the responsibility of children, adolescents or adults. The level of leadership also varies according to the three groups that have just been mentioned and may also be related to their experiences in particular environments, ie. that depends on whether the environment is familiar to the people or not. Children may offer leadership in doing fieldwork simply by showing other children how to find their way through a rocky area by physically leading the other children through a safe passage. Adolescents who have their driving licence may exercise such leadership by navigating their way from place A to B without wasting time. Adults may do the same as the adolescents, but they also could exercise leadership in the field by acting as a tour guide for a group of people who are unfamiliar with the particular area, pointing out the best photograph opportunities and interpreting selected graphics of data in the area on say the relationship between slope and natural vegetation.

The degree of fieldwork expertise required for leadership to be demonstrated really depends on the context for the field activity. In a situation where expert advice is required by a group of professional scientists, there is likely to a very high level of field skill required together with sophisticated analytical skills after the data have been collected and organised. Some formal education experiences for senior secondary and university students fall into this category of skill. However, in more casual situations such as during recreational pursuits and in tourist experiences the degree of field skills need not be as sophisticated because the

clients of the experience do not want precise analyses. They want to experience the environment and use some field skills along the way.

The development of such leadership is something that can be debated for a long time. People such as Nabham and Trimble (1994), Hart (1979) and Robertson (1999) clearly indicate that such leadership is built upon the wider experience that people have of their physical environments from a young age. It may be supported through formal educational experiences in geography and science lessons. It often continues along as a part of people's lifelong cognitive experience. It is a natural component of the learning experiences that people have during their lives. It is not something that is developed especially during periods of formal education. What is acquired during periods of formal education is the language which fieldwork professionals use as the jargon of their trade. This jargon is used in different contexts depending on the extent to which formality is required. It would be used on a geography field trip with university undergraduates. However, it is unlikely to be used on the bus tour for a group of aged residents. These aged people would not want to talk of taking bearings using a compass to calculate direction. They would prefer to know the basic cardinal points of north, south, east and west.

11.8 Promoting Fieldwork Learning

The intention throughout this chapter is to convey the idea that fieldwork does have a distinctive set of skills and techniques that geographers promote frequently and thoroughly in doing their work. This highlights the pedagogic relevance of fieldwork in educational experiences. The previous section to this one certainly drew this aspect to the attention of the readers. This chapter will not seek to reiterate the different pedagogic features that should be considered when developing and doing fieldwork. Rather, it will draw together these features into the life-long learning experiences that people have when interacting with their environments either through direct or indirect means. From a psychological perspective, Langer (1989) used the term *mindfulness* to describe the willingness of people of all ages to be open to new ideas, to appreciate new and different perspectives about one's life-world, and to be able to make conscious decisions to be effective citizens. The proposal here is for people to use fieldwork in much the same way, ie. to practise sound field skills to live more effective lives whilst all the time keeping an eye open for interesting and instructive interpretations of their own life-worlds.

How do mindful behaviours become developed through one's life of interaction with different physical and cultural environments? Developing field skills may occur through deliberate planning learning experiences that children, adolescents and adults experience in

formal educational experiences. However, it is suspected that long-lasting field skills are learned through other forms of life-long learning, eg. from playing by oneself or with other children in particular environments, from watching other people do particular tasks as they interacted with their environments, and from making mistakes when interacting with their environments. These skills are then transferred to other facets of people's lives as they mature and undertake an extensive range of environmentally-based experiences. Therefore, field skills do have a sort of generic quality about themselves that enable them to have wide application in life-oriented adventures.

Within these two distinctive contexts for using and refining fieldwork skills and techniques, quite different strategies are used to promote the fieldwork. In the formal educational settings the emphasis is on using the accessible environments to develop selected skills, enforcing strict safety policies and procedures, maintaining careful organisational control over the activities that occur during a field experience, and standard procedures for collecting, analysing and representing the data. Fieldwork in formal education is a very orchestrated learning activity which has clear goals that are achieved through implementing conventional practices. The lecturer or teacher has a legal responsibility to care for all students that are under his or her care on a field trip.

In the informal situations where people of all ages "take to the environment" to enjoy themselves, to explore its contents, to appreciate its grandeur and beauty, and to understand its interaction with the surrounding world, then fieldwork is much less organised, less structured, involves less standard behaviours to engage in it, and has different outcomes. The approaches that people use to interact with the environment generally do not follow any script. Serendipity prevails and the people engage in a "voyage of discovery" with the environment. What techniques they use and how they employ each technique may vary depending on the circumstance, the mood of the people doing the fieldwork, the nature of the local weather, and purpose of the activity which tends to unfold as it occurs.

Therefore, the promotion of fieldwork can be through active, expert leadership by say a scoutmaster with a group of scouts, or it can occur through people alighting on a "new" environment and wanting to explore it to appreciate its qualities. Through doing fieldwork, people certainly are exposed to the geographical elements in particular environments and they may develop strong environmental values that become important bases for a strong linkage and affinity with the environment in their later years.

In trying to present a case for fieldwork and life-long learning, it may be helpful to reflect on the speculations made by Rex Walford and Peter Haggett (1995) for geography and

geographical education for the next millennium. Then, we can consider how fieldwork might be of assistance in addressing or at least understanding some of these changes. Firstly, in regard to geography, they saw the following changes: increases in world population, increased resources consumption, increased environmental pressures at both local and global levels, further collapse of long-distance space, further switch of resource development into offshore areas, trend away from hierarchically-organised structures, and instability in major geopolitical hegemonies. The use of fieldwork will be necessary if sufficient data are to be collected to explain and understand these projected developments. It may take on a stronger cyber form than is currently the case, but it certainly involve the use of generic fieldwork skills and techniques.

Secondly, in regard to geography as a university discipline, Walford and Haggett suggest the following changes will occur: ROMS (read-only memory) to RAMS (random-access maps) in mapping, synthesis in climatic modelling, analytical regional geography, demographic history, integration of geographic thinking into the history of science more broadly, establishment of global benchmarks for measuring change, and a coming of age for spatial analysis. Fieldwork will certainly be central in the attainment of these changes. The collection of field data will continue to be paramount for micro geographical studies at the regional level. In some cyber form, field data from satellites will become more important for doing macro geographical studies. These data are likely to be organised in some GIS or equivalent data set to be analysed using complex computing techniques.

Thirdly, in regard to geographical education, the "vital variables" which are likely to decide the fate of geographical education are:

1. The extent to which legal structures enable or disable the subject within the future framework of the school curriculum.

2. The extent to which the teaching of the subject continues to capture the interest of school students.

3. The extent to which the subject exhibits intellectual coherence and a persuasive rationale within the whole curriculum.

While fieldwork may not be mentioned directly in this set of variables, it will certainly be an important motivational force for students in promoting geography as a subject that is valuable and fun to study. The idea of doing school work in an outdoor setting still has a strong amount of magnetism for young developing minds. As one of Walford's soon-to-be

geography teachers declared when asked to comment on his or her vision for geographical education in the next century:

> *We have a duty to educate young people so that they have a good understanding of the world in which they live. An old Kenyan proverb states that "The earth is not ours; it is lent to us by our children." So that the next generation can assume responsibility for the earth we, as geographers, need to prepare that generation for that role.* (Walford and Haggett, 1995: 12)

I contend that we cannot achieve this goal unless fieldwork becomes a central part of learning through people's lives and that it a conscious component of our formal and informal learning. It is a big challenge for geographers around the world, but one that is worth winning.

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12. TRENDS AND DEVELOPMENTS IN UNIVERSITY LEVEL GEOGRAPHY FIELD METHODS COURSES IN THE UNITED STATES

JAMES PETERSEN and RICHARD EARL

What . . . confers the noblest delight? Discovery! To know that you are walking where none others have walked; that you are beholding what human eye has not seen before. . . . To give birth to an idea, to discover a great thought—an intellectual nugget, right under the dust of a field that many a brain-plough had gone over before. To find a new planet, to invent a new hinge . . . To be the first—that is the idea. Mark Twain, *The Innocents Abroad* (1869)

There is a real need . . . for geography to build on and expand its tradition of field work.. Rediscovering Geography, National Research Council (1997)

12.1 Introduction

Many geographers have been attracted to their discipline because of an interest in observing, recognizing, and understanding landscape characteristics, first-hand, in the field. Geography field studies vary widely, depending on the geographer's sub-disciplinary interests, including: 1) mapping, recording, or explaining the distribution or nature of landscape features, 2) gathering, measuring, and analyzing data or information in the field, 3) studying the components and processes of human or physical systems, and 4) investigating the two-way interactions between environments and humans. Basically, geography in the field involves the what, the where, the why, and the workings of "there," when "there" refers to somewhere outside of the academic classroom, laboratory, or office, and the *method* of finding out the answers to these questions requires going "there." Gertrude Stein (1937) said of Oakland, California, that "there is no there there," but a skilled field geographer would be unlikely to come to that sort of conclusion about any locality.

Throughout the 20th century, field studies have been included in geographic education to some degree, but its emphasis has waxed and waned in response to practicalities, trends, and *Zeitgeist* in the discipline of geography. In the 1960s, a report on the status of fieldwork in the geography programs of US universities (Corey, et al. 1968) was commissioned by the Association of American Geographers. The report begins with the

R. Gerber and G.K. Chuan (eds.), Fieldwork in Geography: Reflections, Perspectives and Actions, 211-234.

declaration that, "A belief in the importance of field work is an essential ingredient in the value systems of many professional geographers" (McNee 1967, in Corey 1968). Relatively little attention has been given in recent years to the status of field methods courses in US geography departments (Friberg 1975, Thomas 1978; Lee and Swarts 1994). Although this paper may suggest parallels and/or contrasts among the international geography community, it focuses on United States universities, examining courses intended to prepare future geographers for conducting field studies.

During the first twenty-five years of the twentieth century, academic geography moved away from the vicarious study of places, primarily through archival materials. A new emphasis emerged toward critically analyzing, validating, supplementing, or revising existing sources of geographic information through evidence examined in the field. Field studies had also been important to geography in previous decades, but at that time, opportunities for field experience were increasing, particularly for students. One reason for this change was the greater availability and ease of transportation, which facilitated travel to field sites. A focus on field study was also one of several responses to a few misguided, but nevertheless popular, approaches to the discipline such as environmental determinism, rote memorization of place names or superlatives, and what has been derisively termed "armchair geography."

In the second quarter of the century, academic geographers shifted more strongly toward information gathering and measurement in the field. This disciplinary change was a time-transgressive process of acceptance as the diffusion of ideas, technology, and methods followed a typical adoption curve. By the last half of the twentieth century most university geography programs in the United States included some form of field study for students, although only a minority of departments offered formal, field-oriented coursework (Corey, et al. 1968). University field study in geography includes several possibilities as outlined below.

Field trips are excursions conducted to give students an opportunity to personally observe examples of geographic phenomena (Lewis and Patton 1994). Ranging in length from less than a day to extensive travel with overnight stays, field trips may involve visiting sites from local to global. Field trips may also form the core of an entire course, called *field trip courses*, that are particularly common with foreign study trips. The distinction between field trip courses and field methods was noted in Corey, et al. (1968).

Fieldwork is defined for our purposes as research efforts in the field with a scholarly, rather than an instructional or pedagogical purpose.

Field methods courses are classes designed to provide students with instruction in using field equipment, applying field techniques, collecting and recording data/information in

the field, posing questions that can be addressed through fieldwork, and analyzing and/or displaying field-gathered information and data. *Field camps* offer a similar experience, but involve an extended off-campus experience at a field site (or several sites), often during summer months (Lee and Swarts 1994).

Courses in field methods generally involve practice in data gathering and problem solving, followed by analysis and presentation of findings in written, oral, and/or graphic formats. Field methods courses train students to conduct geographical fieldwork, by providing them with opportunities to gain hands-on experience, while practicing and developing their skills. One rationale for these courses is to prepare new generations of geographers, teaching them to be competent fieldworkers who would go on to conduct research in the field.

This paper reviews the development of field methods courses in geography (rather than fieldwork, or field trips), their change over time, and their present status. As a component of geography degree programs in US universities, field methods courses have not been static in either pedagogy or their level of prominence among geography course offerings. Consideration is given to the trends and attitudes that now, or may in the near future, directly affect this course as it is taught in American universities. One source of data and information was gathered through a nationwide survey, using a questionnaire that was completed by faculty who teach field methods. The authors also draw from their own experiences over the last thirty years, initially as students, and then as instructors in undergraduate and graduate level geographic field methods courses. Enrollment data for the last 20 years were gathered from annual editions of *Schwendeman's Directory of College Geography in the United States,* and the *Association of American Geographers' Guide to Programs in Geography in the United States and Canada.* The questions to be examined include the following.

1) How did field methods develop as a course in US geography departments?
2) How have the course's prominence and content changed over time, and why?
3) What are the current content and learning outcomes of these courses?
4) What are the prospects for field methods on the cusp of the twenty-first century?

12.2 Historical Development of the Geography Field Methods Course

Field study has a rich tradition in our understanding of geography of the United States (Platt 1959). The development of academic geography in the US came on the heels of an era of national exploration, particularly in the American West. Reconnaissance geographic surveys of the nineteenth century, conducted for exploration and scientific discovery, captured public attention and also influenced American geographers and their discipline. One indicator of the level of public interest is that contemporaneous and recent accounts of these surveys have received best seller status such as those of the

Lewis and Clark expedition (Ambrose 1996) and the surveys of John Wesley Powell (Stegner 1954; Powell 1961).

Since the late 1800s, when academic geography was established in American universities, field study has been considered an important part of geographic research, but, at that time, fieldwork was generally conducted by the professor, who conveyed the results to students in classroom lectures. Offering field training to any but a relatively small cadre of advanced students was to come later. William Morris Davis (1954), founder of the Association of American Geographers, considered field methods instruction critical, particularly for answering geographic questions through field study, and he transferred his interest in fieldwork to several generations of academic progeny (James 1972).

In the 1920s, a group of geographers who had graduated from the University of Chicago organized a series of field conferences that were held at various Midwestern locations, with the site varying from year to year. The intent of these conferences was to discuss, propose, test, and apply, field methods and techniques, following up with publications concerning their findings (James 1972; James and Martin 1978). Experienced fieldworkers shared their experiences, with an emphasis on problem solving in the field. The impact of this conference series was great, as ". . . the concepts and methods derived from these discussions in the field have had a profound and lasting influence on the course of American geography" (C.M. Davis 1954).

Aerial photographs, beginning in the 1930s-1940s, followed by remotely-sensed imagery beginning in the 1960s-1970s, have been used in the field as map surrogates for land use analysis and field mapping (C.M. Davis 1954). Both observation and sampling in the field provided ground truth for interpreting air photos and other imagery (Lee 1975). The availability of aerial photography and other remotely-sensed images also instituted a fundamental change in the field study of landscapes. Originally the process proceeded from field observation and measurement to develop new maps or landscape images, often where none existed previously. Remote sensing changed the process, by providing landscape images (or map surrogates) first, that were followed with the processes of field observation, verification, and mapping.

In *American Geography: Inventory and Prospect* (James and Jones 1954), written to examine the discipline's status and potential in the 1950s, an entire chapter was devoted to field methods. Inclusion of this chapter clearly indicated the prominence of field methods in the geographic discipline at that time. Charles Davis (1954) stated that, "(a) distinctive feature of professional geography as practised in the United States during the past four decades (1914-1954) has been the attention to the field study of small areas." Davis further characterized field study that incorporated mapping and interviewing, as directly embodying the third and fourth members of what he termed "the four sources of

geographic factual information: 1) documents, 2) air photographs, 3) direct observation, and 4) interviews." In summary, Davis declared that "(d)irect contact with the area in which a problem is located is one of the hallmarks of sound geographic research."

The quantitative revolution in geography of the 1950s-1960s exerted a strong influence on field methods courses. Eventually, techniques including statistical sampling, quantitative measurement, and interviewing were incorporated into most courses. Field methods fit well into the paradigm of the quantitative revolution, as most techniques taught in such courses were designed to gather data, albeit both qualitative and quantitative. Field methods courses provided a mechanism for obtaining data, and for training future geographers in quantitative approaches to field research.

In *Frontiers in Geographical Teaching* (Chorley and Haggett 1965), a British work that was very influential among US geographers, field study was presented as a means for making urban, economic, and land-use geography relevant, exciting subjects (Board 1968; Collins 1968). In the late 1960s, the Association of American Geographers commissioned a thorough evaluation of the status of field methods in a report entitled *Field Training in Geography* (Corey, et al. 1968). This volume's appearance as the first in a series of Commission on College Geography Technical Papers underscores the importance conveyed on field training by that distinguished group of geographers. Yet they also reported that only seven percent of university/college geography departments offered undergraduate field courses, and that attendance in those courses was only 0.5% of the total geography enrollment reported to the *Directory of College Geography* for the academic year of 1965-1966. Those data and the report together reflect the paradoxical situation of field methods instruction for students, particularly undergraduates, over the years. Field methods receive authoritative proclamations of enthusiasm and calls for improvement, but in actual practice such field courses are supported only by a relatively small, dedicated cadre of geographers.

In the 1980s, *Geography in America* (Gaile and Willmott 1989), another report on the discipline's status, barely mentioned either field studies or field methods teaching. Yet another *de facto* indicator of the declining interest in the teaching of field methods is the absence of any new American texts for these courses. The most recent US textbook available is *Introduction to Geographic Field Methods and Techniques*, second edition, by Lounsbury and Aldrich (1986), which was a modest revision of their original 1979 text. A comparison between Charles M. Davis' (1954) description of field techniques and those provided in the two most recently published textbooks in field methods (Stoddard 1982; Lounsbury and Aldrich 1986) suggests that after thirty years, relatively little had changed in the instruction or content of geographic field methods courses. The texts from both periods emphasized basic mapping, field use of air photos (and later, other types of imagery), sampling, note-taking, and interviewing. The only major change that is apparent between the outlines of field methods courses presented in these

publications is the omission of field sketching from the most recent text by Lounsbury and Aldrich (1986).

Demand created by enrollment levels encourages the development of new texts, but enrollment in field methods courses has always tended to be small, in part to facilitate individualized instruction. The lack of up-to-date texts, however, also has an adverse impact on enrollments, sparking a vicious circle. Peter Glynn (1988) published a very useful text on geography fieldwork in the UK, but the text's British setting, focus, and presentation may limit its utility for field methods courses in the US (North 1999). A review of Glynn's text by Margaret North (1999) calls for the author to revise this book for an American or an international market, in order to meet a need in the US and other countries (North's suggestion has received favorable consideration by Glynn). North, the reviewer, offers an international perspective, as she teaches field methods in a Canadian university, but received her geography training in both Britain and the US.

The development of microcomputers and related digital equipment has had a great impact on geography, and in recent years, many new technologies have been introduced into field methods courses (Nellis 1994). In the 1990s, highly portable digital equipment that employed the global positioning system (GPS) greatly simplified location finding in the field. Using GPS, many aspects of field mapping can be accomplished through designated field traverses, with instant recording of locational coordinates (Wikle and Lambert 1996). The data logging and analytical abilities of a GPS system, combined with computer-assisted cartography, greatly facilitate map production for displaying the results of field measurement and study (Stafford and LeBars 1996; Graham 1997). These labor-saving techniques should encourage both mapping and the gathering of spatial data in the field by students. In the past, drafting maps, diagrams, and data displays was a time-consuming, but requisite follow-up to field time.

Ironically, despite these improvements, enrollment levels have appeared to decline in recent years along with the number of departmental course offerings of field methods classes. Field courses have experienced difficulties in keeping up with the integration of digital technologies, and the technological lag that affects the course is further exacerbated by the use of old textbooks, the only ones available.

Currently, two thousand students in US universities enroll in field methods courses each year, but this number represents only about 5% of the total annual enrollment in geography techniques courses and 15% of all undergraduate majors in geography (*Schwendeman's Directory*). Actually, in terms of absolute numbers, field methods enrollments have not declined over the last thirty years. Enrollments in field methods courses were static from 1968 to 1998, while the number of students taking geography techniques courses overall has quadrupled (data from *Schwendeman's Directory*), and general enrollments in college geography courses have also grown.

The 1998 edition of *Schwendeman's Directory of College Geography of the United States* lists seventy geography departments or programs with field methods among their course offerings. Only 69 AAG members, 1% of its 1999 membership (6910), list field methods as one of their technical proficiencies in geography (data from the Association of American Geographers). It is important to note that these figures include all individual members of the AAG, many of whom are not university faculty members, and some of whom belong to that organization, but work and live outside the US. The 1996-1997 AAG *Guide* indicated that only 22 US faculty members (16 males, 6 females) listed geography field methods as a sub-disciplinary specialty. Presumably, the other individuals who teach the field methods course do not consider that topic to be a technical specialty, *per se*, but are involved with the course in order to support their main interests in the discipline.

It is difficult to ascertain how many individuals, or geography departments, are involved in offering field methods courses in the US. Two earlier questionnaire-based studies present conflicting information (Thomas 1978; Lee and Swarts 1994). These studies involved sending questionnaires to all geography programs, not just those listed in the *Schwendeman's Directory*, which must rely on departments to respond to its annual survey of departments for data. In the mid-1970s, Thomas (1978) found that 151 departments or programs out of 281 respondents (56%) offered "field techniques" courses. In 1992, a questionnaire sent to all chairs of geography departments or programs listed in the 1991-1992 AAG *Guide to Geography Departments* revealed that 76 percent of the 153 respondents indicated that their department taught courses in "field geography" (Lee and Swarts 1994). In 1987, Dunn reported that only 17 percent of undergraduate geography programs offered field methods courses, using data based on *Schwendeman's Directory* for that year. One reason for this apparent disparity is that Schwendman's publication compiles actual enrollment data for each geography course offered (including field methods) as reported by the departments that respond to their annual call for data. This manner of reporting provides a more valid reference to field methods courses, as opposed to merely asking departments if they offer "field geography," or "field methods instruction," which may refer to other kinds of educational experiences, e.g., field trips.

In recent years, enrollment data indicate that the relative prominence of field methods courses has diminished in American geography departments, despite authoritative calls lauding their value, even to the point of suggesting that a geographical education is incomplete without such training. In his presidential address to the Association of American Geographers in 1956, Carl O. Sauer declared that, ". . . the principal training of the geographer should come, wherever possible, by doing field work." Yet, how can this ideal be realized if field methods courses, the dominant mechanism for training future geographers, receive little effective emphasis in the geography departments of the

United States, or elsewhere for that matter? The situation leads to the inevitable question—are field methods courses, and by extension field study, relevant in these times of the digital revolution in geography?

12.3 Field Methods Courses in the United States Today

The status of US field methods courses today was investigated using a questionnaire that was sent to the seventy US geography programs that listed field methods in their course offerings in the 1998 *Schwendeman's Directory*. Each questionnaire, containing 37 items, was answered by a faculty person involved with teaching field methods courses, but in this study no data were gathered directly from students taking those classes.

The questionnaire was designed to gather current baseline knowledge and data as well as identify recent changes and trends in teaching geography field methods in the US. Because it is difficult to ascertain who is teaching these courses at various institutions, the questionnaire was sent to the department chairperson with a request to forward it to the faculty member most responsible for field methods instruction. Thirty-two questionnaires were returned, a response of 46% (an intriguingly low rate of return considering that questionnaire design and use is a core component of many field methods courses). Our response rate is considerably lower than those sent to department chairs in the 1975 study (69%) by Thomas (1978), and the 1992 study (63%) by Lee and Swarts (1994). The low response rate received in this study may have resulted, in part, because of our indirect means of communication with the respondents.

Most of the respondents to the questionnaire, individuals teaching field methods, were male (84%). Women faculty members comprise about 19% of the membership in the Association of American Geographers, but only 16% of our respondents. This difference is probably not significant, however, because of our small sample. The addition of only one more female response would bring these two values about even, which would suggest that women have about the same level of interest in teaching field methods as do men (proportional to their representation as geography faculty). Most respondents had experienced at least one field methods course as a part of their own training in geography (81%). Individuals from many sub-disciplines within geography teach field methods, but there is a preponderance of physical geographers, as illustrated in Figure 1. Similarly, faculty of all ages (judging from the year of their terminal degree), and thus, presumably all ranks, teach field methods (Figure 2). The teaching of field methods by faculty who received their terminal degrees (and thus were likely hired) during the last decade suggests that departments continue to have a perceived need for hiring new faculty with an interest in, and an ability to teach, field methods.

The range of field methods class sizes varies from 4-40, with a median enrollment of 15 students. Most commonly the course is offered only once per academic year. A

majority of field courses (68%) do not include overnight trips, but those that include such excursions have trips ranging from 2 to 28 nights with a median of five days. The outdoor sites for field methods instruction are distributed fairly evenly among campus, urban, rural, suburban, and wilderness/natural settings.

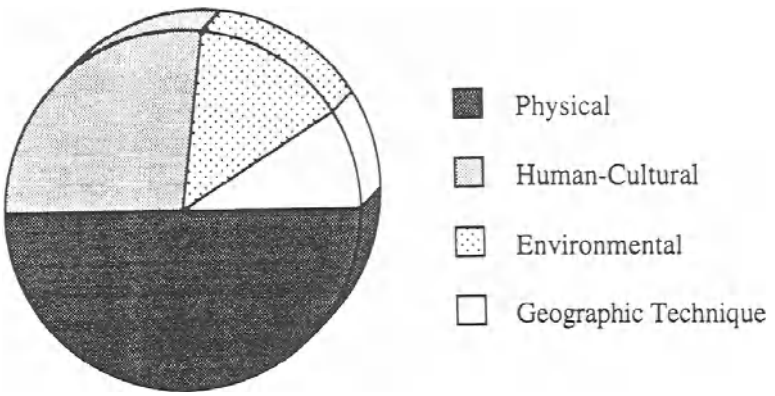

Figure 1. Sub-disciplinary geographic interests of field methods faculty. Physical geographers dominated our respondents (50%), followed by human/cultural geographers (27%), environmental geographers (14%), and those geographers who cited a technique (cartography, GIS, remote sensing) as their specialty.

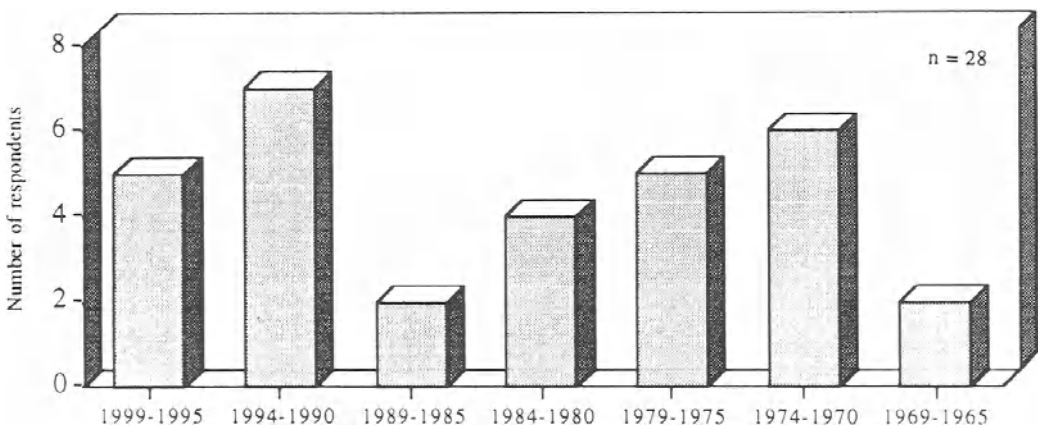

Figure 2. Field methods faculty respondents: year of completing terminal degree in geography. The low value in the 1960s reflects retirements, note the decline from the 1970s to the 1980s, and the resurgence in the 1990s (perhaps some replacing 1960s-graduates who retired).

The content of training activities in field courses, ranked in order of decreasing frequency by geographic sub-disciplines is as follows: geomorphology (most frequent), mapping/surveying, biogeography, cultural/human, planning/land-use, soils, economic, recreation, and climatology/meteorology (least frequent). This ranking, shown in Figure 3, probably reflects the sub-disciplinary emphases of the faculty members who are teaching these courses, because individuals tend to teach what they are most interested in and know best. Local settings and conditions provide either special opportunities or limiting factors for fieldwork that can also exert an influence on the course content.

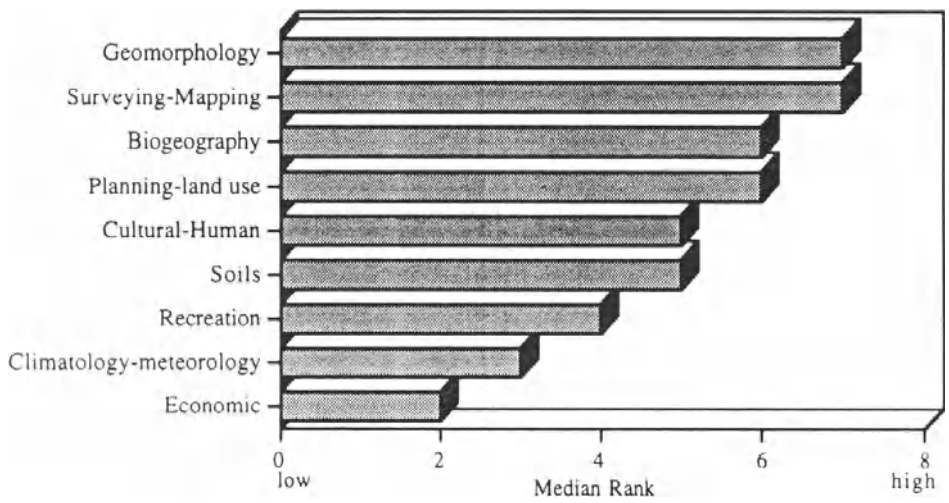

Figure 3. The content of field methods activities, ranked by frequency. Respondents ranked several sub-fields of geography by the frequency of content emphasis in field activities performed by students in their courses. Higher values of mean rank signify greater levels of frequency in field activities.

In response to a question about the most important techniques that are included in their courses, the respondents indicated that traditional methods receive more intensive and detailed coverage than many methods that rely on newer, high-tech equipment. For example, most faculty teach plane-table mapping rather than laser theodolite surveying. Faculty were presented with a list of techniques and asked to select the statement that most closely indicated the coverage level for each technique in their course. The techniques in median rank order, along with the coverage choices are shown in Table 1. The median rankings of usage levels for these techniques may not indicate the faculty members' true preferences, but rather may be a pragmatic acknowledgement of limitations resulting from the costs or availability of newer technologies.

Table 1. Class coverage of techniques by median rank. Median responses to the level of technique coverage in class based on the following ranked choices.

Median Rank	Technique
1. Direct (hands-on) use by students in the field, with demonstration and class coverage.	
1	Analysis of field data (descriptive).
1	Analysis of field data (inferential).
1	Computer-assisted compilation and statistical analysis of data gathered in the field.
1	Computer-assisted graphic display of data gathered in the field.
1	Describing and analyzing aspects of the geographic landscape.
1	Designing field research problems.
1	Global positioning system.
1	Sampling and sampling design.
1	Use of Internet accessed data and information in the field.
1	Use of published or archival data and information in the field.
1	Using environmental monitoring equipment (current meter, barometer, anemometer).
1	Using maps in the field.
2. No hands on student use, but demonstration to the students by instructor or teaching assistant.	
2	Administering questionnaires.
2	Interviewing.
2	Land use mapping/analysis.
3. No demonstration or hands-on use, but mentioned in lectures and course readings.	
3	Defining regions (CBD, neighborhoods, community, natural regions, hazard zones).
3	Environmental evaluation and assessment.
3	Surveying-mapping (alidade/level/plane table).
3	Using aerial photographs in the field.
3	Using remotely sensed imagery in the field.
4. Not covered in the course as it is currently taught.	
4	Assessing Human-environmental perceptions and attitudes.
4	Surveying-mapping (laser technology).

12.4 Attitudes Concerning Field Methods—the Course and its Content

Two questions, placed in successive order on the form, sought to gain insight about faculty attitudes, compared to those of students, about the rationale and value of taking a field methods course. The strategy was to ask essentially the same question in two different ways, first from a student viewpoint, and then from a faculty one. The first question addressed why faculty members believe students take a field methods course, and the second asked what those faculty consider to be the most important goals for student learning in a field course. Because only faculty members were asked to respond

to the questionnaire, it is important to note that in one question we were asking for their personal opinions, and in the other we were asking *for faculty perceptions of student attitudes.*

What are the two most important reasons why students take field methods? Fifty-three responses from 31 respondents were received on this question. Generally, the reasons cited fit five categories, listed in order of decreasing frequency (high to low perceived importance): (1) the course is required for a degree program, (2) to practice, learn and develop job-related skills, (3) to learn how to use equipment in the field, (4) to develop skills required for conducting geographic research, and (5) general enjoyment or appreciation of learning in an outdoor environment. It is interesting that the most frequently cited reason is that the course is required. In other words, not all students are freely volunteering for this experience, but they need this class in order to graduate. Our own experiences (as faculty members) tend to support the contention that the strongest motivational factors among *students* are meeting degree requirements and the development of career-related skills.

What are the most important goals for student learning in a field methods course? Faculty were asked to rank five statements about student learning goals in order of importance from high to low. Faculty ranked (1) fundamental scientific skills and (2) geographic problem solving as the two most important factors, followed in order by (3) applying geographic concepts in the field, (4) skills with direct career applicability, and (5) applying new technologies.

The results from these two questions (Table 2) suggest that the factors that motivate an interest in field courses and the reasons for the perceived value given to field methods are fundamentally different for faculty in comparison to students. Students today tend to have a great interest in learning new technologies and developing job-related skills, two factors that were ranked lowest by faculty. Faculty members stated that they were most interested in teaching scientific field methods and solving research problems. Faculty had a low interest in teaching technology applications or career skills, but they judged that these two factors generate relatively high levels of interest among students. This apparent communication gap between student and faculty goals may be a fundamental problem in field methods courses and help to account for its stagnant enrollment over the last thirty years. Given that the most common student response involved being *required* to take the course, one wonders how enrollment numbers would be affected without mandatory conscription. Because it is the faculty who ultimately decide the content of these courses, perhaps a greater effort toward addressing student needs and desires, combined with an effort to explain the importance of scientific method and problem solving in a geography education would bring the two sides closer together. Further study with information directly from students would be required to confirm the nature of

the situation, because this study only sought data from faculty. This relationship deserves further attention.

Table 2. Differences in faculty perceptions about what students should learn in a field methods course versus why faculty believe students enroll in the course. Each column is ranked by relative frequency, or importance of response, from most important (top) to lower importance (bottom).

Faculty perceptions of learning goals	Faculty perceptions for why students take the course
Develop fundamental scientific skills.	The course is required for a degree program.
Geographic problem solving.	To practice, learn and develop job-related skills.
Applying geographic concepts in the field.	To learn to use technology in the field.
Skills with direct career applicability.	To develop geographic research skills.
Applying new technologies.	Appreciation of learning in an outdoor environment.

12.5 Results From Other Open-ended Questions

The questionnaire presented other open-ended queries that did not suggest alternative responses. These questions were mainly directed toward major concerns about field methods, and the factors that affect teaching field courses and their enrollments. A brief discussion of these questions follows.

What important changes have occurred in the content and teaching of geography field methods courses in the last five to ten years? The most important change cited was the integration of new technologies for gathering and analyzing field data and information. Field equipment is becoming more sophisticated and expensive, but generally offers advantages that make their use important. Geographic information systems (GIS) and the global positioning system (GPS) were frequently cited among these technologies. The most commonly used land survey method mentioned employed traditional transits (a rather low-tech approach), but the application of GPS is widespread. Another change mentioned is the manner in which data and information gathered in the field are recorded, displayed, and analyzed. Most field methods courses now involve follow-up time in a computer-equipped laboratory for statistical analyses, as well as the use of computer-assisted mapping, digital image processing, and GIS. Activities involving field reconnaissance for remotely-sensed imagery have also increased. Many respondents cited an increased use of applied geographic studies, and increased data collection from secondary sources.

Interestingly, use of the Internet is being integrated into some field courses as an archival research source to support field study and also as a means of presenting field work conducted by students on a class web page. One respondent expressed concern,

however, that, "really integrating technology involves more time in lab, and time for learning equipment and techniques and therefore, leaves less time for field experience."

What changes would you propose to increase student interest in field methods? When faced with the question of how student interest might be stimulated in a field methods course, the faculty responses varied widely. Some faculty members felt that the course should be required for students majoring in geography, or for those who are concentrating on certain sub-disciplines within geography programs. Requiring the course under one of these two scenarios is already being done in some geography programs, and making a course required would certainly increase student enrollment. The real concern, however, is devising strategies for increasing student interest, not merely raising enrollment numbers. It is unlikely that most people who teach field methods would prefer having a class that contains a significant number of conscripts, whose level of interest may be not be as strong as a group of students who personally sought out that particular class. One respondent stated that honors students should be encouraged to take the course, an expression of the desire to take motivated students into the field.

Despite our survey results which, when they are amassed, indicate a communication gap between faculty and student perceptions of course goals, several faculty members mentioned (sometimes with great emphasis) that a focus on the development of directly applicable career skills would pique student interest. Others felt that students were not fully cognizant of the academic and career benefits that are already incorporated into field methods courses. In other words, a part of the problem is one of trying to increase student awareness of the *value* of field studies, and of the professional/academic experiences that applied study in the field can provide. One reason why this awareness is important is that word-of-mouth recommendations among students can play an important role in generating interest in field methods courses. Linking field methods to the content of environmental courses and to local environmental problems were two other suggestions for generating student interest in field methods courses.

What challenges or difficulties do you face in teaching field methods? The responses to this question were many and varied, but could be classified into five categories of issues. These include issues concerning: (1) logistical and financial support, (2) technology, (3) students, (4) the discipline of geography, and (5) available teaching materials. Some of these issues are also intertwined, such as the difficulty of getting adequate departmental or institutional support in order to teach the course properly. Some respondents noted that they often must spend their own money for field expenses.

A large and growing concern cited by many faculty members is the worry about legal liability, including responsibility for university property taken into the field by students or faculty. Field equipment is becoming smaller (thus easier to lose), is often somewhat

fragile, can be costly to repair and maintain, and is becoming increasingly expensive. The most important concern about liability involves the fear of legal action, especially lawsuits resulting from students becoming injured (or perhaps injuring someone else, or damaging property) during a field excursion. Dealing with the university's efforts to protect itself from such potential problems often complicates teaching because the instructor is directly involved in these legal and bureaucratic concerns. Faculty who take students off campus often must deal with increased administrative paperwork, including permissions for off-campus travel, and legal forms that the students must sign which are intended to release the university from legal liability. In fact, many instructors are concerned that the university's main interest is in protecting or defending *itself* from litigation, and not necessarily the faculty member who is involved.

In the litigious society of the US, the problem of concern about liability is so ominous that certainly many individuals are wary of taking students, even consenting adult students, anywhere off campus. Many academic geography organizations, through cooperating insurance firms, offer individual insurance plans that provide representation by an attorney to their members in the case of a legal problem connected with their duties as a faculty member. This is a serious problem in the US that involves many gray areas in terms of the law, but many faculty feel that they would ultimately be held responsible and perhaps liable for any sort of accident, damage, or injury that could result while students are in the field.

A sample of faculty concerns is provided in Table 3. Most statements are paraphrased for clarity or brevity, but quotation marks indicate direct quotes. Several of these issues have been previously discussed, others are provided to offer a full range of these concerns.

12.6 Faculty Impressions of Field Methods in a Geography Education

As one might expect, the faculty involved in teaching field methods are strong supporters of the importance of this course in the education of a geographer. Judging from their responses, and the emphatic nature of those comments, the cadre of individuals who teach field methods seem dedicated to the task, and are confident in the value of the course. Several people mentioned that for undergraduates, a field methods class is one of the very few courses that take students completely through the process of conducting a study. Students progress from defining a problem or question, through gathering primary data and information, to analyses, and the presentation of findings. Other benefits mentioned were integration of research skills, experience conducting studies in the field, gaining general field experience, and developing skills of observation, recognition, and synthesis. Selected quotations from respondents are presented in Table 4.

Table 3. Selected faculty responses to the question: What challenges or difficulties do you face in teaching field methods?

Concerning Institutional/Departmental Support and Logistics:
- Equipment acquisition, and transportation for overnight trips.
- Departmental support of other faculty expenses.
- Lack of field training among younger faculty.
- Logistics money for Transportation, vans, etc.
- Great increase in liability concerns.
- Difficulty of access to appropriate areas for fieldwork.
- Access problems (distance from campus).

Concerning Technology:
- High cost of new technology in an adequate supply for hands-on individual instruction.
- Difficulty of upgrading equipment to keep up with rapidly changing technologies.
- Students today are demanding the latest up to date high technology.
- Overemphasis of computer lab work.
- Low student interest in using computer software for analysis. (complained about non-user friendly software available).

Concerning Students:
- Great variation in student background levels and interests.
- "developing exercises and activities that will appeal to both human and physical geographers."
- Difficulties for students to commit to overnight or lengthy field experiences, because of other responsibilities.
- Getting students to work together harmoniously in small groups on a project.
- "Students recognizing the importance of analyzing and representing data, not just collecting it."
- Scheduling large blocks of time (required for courses) in student schedules.

Concerning the Discipline:
- Field oriented research seems to be declining in the discipline of geography.
- A perception exists that remote sensing can solve most field problems and acquire most data required for field problems.

Concerning Available Teaching Materials:
- Texts out–of-date, or out-of-print.
- No appropriate or recent textbook.

12.7 Discussion and Conclusion

For most of the twentieth century, having a knowledge of field methods was considered to be a fundamental part of a geographer's education. Geography field methods courses, designed to provide this knowledge, have generally focused upon large-scale mapping, detailed observation of landscape features, and the collection, analysis, and presentation of geographic information. Over the years, field methods courses have often incorporated new (or newly available/affordable) approaches, techniques, and

technologies in order to meet the changing needs, concerns, and paradigm shifts of the discipline.

Table 4. Selected faculty impressions about the importance of field methods in a geography education.

- "Geographers who cannot identify phenomena in the real world are useless."
- "Field methods is a good integrative course. Geographic skills in observation, data collection, data analysis, information synthesis, mapping and report writing are learned in such a course."
- "Field methods (courses) develop confidence in the value of geographic training."
- "Field methods makes the abstraction of the classroom become real."
- "There is no proof except in application—there is no test better than the ability to predict."
- "Today there is too much reliance on the computer. The growth of GIS has often come at the expense of primary data collection."
- "Field methods training is the best way to teach students how to collect data, frame questions (hypotheses) and test them in the field. A field methods course is perhaps a geography student's only chance for moving from textbooks to observation. This is critical to training scientific minds."
- "Students not only need to learn, they also have to learn to do."
- "The best data analysis comes from someone who knows and understands how the data were gathered."
- "To be effective as a geographer, a professional must be able to critically evaluate landscapes."

Academic geography provides the lead for disciplinary changes and the field methods course then must either adapt its content to integrate new methods, technologies and approaches, or risk being perceived as outmoded. This adaptation process is complicated for several reasons, but particularly because the field methods course often must generically serve many of the sub-disciplines of geography, much like instruction in quantitative methods does, for example. The historic process of change in field methods courses is similar to that proposed by the concept of punctuated evolution. Long periods of "stable decline" can eventually place field methods in a maladaptive academic environment, a condition which triggers an episode of rapid adjustment of the course content in order to adapt it to the times and stay current. The mode of change is not continuous and smoothly integrated, in part, because it is far easier to intellectually accept new technologies or approaches than it is to integrate them into a field course.

Many of the reasons for the lag that precedes adjustment are not directly controlled by those responsible for teaching the course. Yet, new technologies can actually create many new opportunities for field study, and incorporating them into field courses adds freshness, currency, and relevance. Technology, technique, methods, and paradigms may change over the years, yet going into the field to gather geographic data and information remains a timeless exercise.

The digital revolution has provided powerful data gathering, analyzing, and presenting technologies to practitioners of geography. More than a mere revolution, advances in technology and in related applications have provided an explosion of change in the nature of geographic and spatial information handling that has had an impact (or will) on most aspects of geographic research. For field methods, one fundamental change is that the skills required to become a competent professional geographer in the United States can no longer be obtained through fieldwork alone (at least for most endeavors). Field methods, however, still provide the only effective means for obtaining many types of geographic data and information, both physical and human. To borrow from Ecclesiastes (1: 4), as cited by George R. Stewart (1949), the novelist and English professor who was influenced by Carl O. Sauer at Berkeley—"men go and come, but Earth abides." Likewise, technology, methodology, and paradigm too, come and go, but the field abides.

Our study suggests that the perception of the geography field methods course has changed from a core course in geographic skills to a useful, but not essential, part of the geography curricula. Today, the course is not even offered in some geography degree programs. Part of this change has been brought about by the development of technologies and associated new coursework to support them, such as classes GIS and remote sensing. These courses have expanded the menu of applied-techniques courses that compete for space in a geography student's degree program. Twenty-five years ago cartography and field methods were often the only two options for applied-technical skill development in geography, but today the course offerings in this area are many. Other courses that are intensive in their demands for equipment or logistical support compete with (and generally out-compete) field methods courses for resources and funding in geography departmental budgets. One factor in this problem may the disconcerting finding by Lee and Swarts (1994) that 25% of the geography department chairs who responded to their survey indicated that field methods are obsolete in today's academic environment.

In her study done in the 1970s, Sharon Thomas (1978) attributed the apparent popularity and increase in field methods instruction to students' interest in gaining employable, job-related skills, and direct experience with equipment and techniques. A further benefit was that the students could list these experiences and skills on resumes, which would be beneficial in their future career search. Only eleven years later, Rundstrom and Kenzer

(1989) cited cost and the increasing availability of secondary data as factors contributing to the decline of fieldwork in human geography. The impact of these factors, which were directly affecting researchers in human geography, would tend to diminish the numbers of those faculty in the teaching of field methods, and would certainly not encourage interest among their students in taking a field methods course.

Computer-assisted and digital techniques can facilitate fieldwork and make it easier to conduct. Yet, the integration of new technologies has made teaching field methods more difficult, rather than easier, and also more expensive in terms of set-up and maintenance costs. These factors, combined with increased costs for transportation and a fear of liability, have made field methods instruction more cumbersome to teach, and therefore less attractive to faculty. Both academic and pragmatic concerns complicate the teaching of geography field methods.

Today, without the integration of technology, field methods courses will be considered by many as outmoded. Yet, relying too heavily on technological training may limit the development of other valuable geographic skills, as well as "field savvy." In pragmatic terms, an overemphasis on technology can slight attention to solving field problems, become a sterile training session for equipment operation, can be overwhelming for the students, too expensive to fund and maintain, and overly demanding of the faculty who offer these courses. The latter is particularly true because of the recent increase in time and energy spent on logistical and liability concerns.

Rediscovering Geography (1997), an assessment of the discipline by a committee of the National Research Council, strongly supported the importance of field methods, particularly in light of data availability and the digital revolution.

> *The recent development of global data bases and remote sensing technologies has tended to direct attention away from fieldwork as an element of geographic research. Rather than make fieldwork obsolete, however, these developments have led to new questions about the meaning and significance of data, and about the gaps and shortcomings in databases and technologies for data acquisition. Fieldwork is not only important as a check on data sets and remote sensing imagery, there are enormously important forces at work shaping the geography of the planet that are unlikely to be understood unless one ventures into the field* (Rediscovering Geography Committee 1997, p. 159).

The report goes on to state that field studies are just as important to *education* as they are to *research* because they engage student interest, attract students who wish to pursue applied studies dealing with the "real world," and enhance their understanding of our complex world.

Aside from incorporating digital technologies into field applications, there are several other reasons why field methods courses should continue to have a niche in the changing environment of geography. Experience in field methods heightens students' powers of observation and analysis, an ability that will also help them in non-field based subjects (C.M. Davis 1954; Friberg 1975; Rediscovering Geography Committee 1997). Field study enlightens students with first-hand experience in the complexity of the world, and in completing a task under what often are less than optimum conditions, typical of the sort that can be encountered in the field. The Rediscovering Geography Committee (1997) stated that analysis and solution of problems in the field "heightens . . . appreciation of the geographic consequences of decisions and actions." Field methods courses provide many students with a career reconnaissance that may link their personal interests with a professional future in the discipline of geography, whether theoretical or applied.

Training and educating new generations of geographers in field methods, techniques, and skills may be exciting and intellectually stimulating, but it has never been easy. In fact, such courses are fraught with complicating factors, whether academic, administrative, or logistical. Inherently, field courses offer more challenges to an instructor than would be faced in a typical classroom setting. Yet, the geographic literature is rich with statements lauding field approaches as *essential* to the discipline. This widespread acclamation by geographers sounds fine as a *concept*, but in *practice* the priority given to field methods training and study has often been minimal. Periodically, authoritative calls have lamented the lack of field training available to, or experienced by, apprentice practitioners of geography. As geographers have focused their attention on the latest academic "bandwagon," whether of paradigm or technological application, the importance of field study has often been directly affected. Changes in the discipline have sometimes had a positive impact, but in many other cases, field methods courses have become neglected, or under-appreciated.

In our analysis of the questionnaire we found that the faculty responsible for these courses are primarily concerned about teaching fundamental scientific and geographic principles rather than more directly employable job and career skills. From the authors' experience and perspective there is a fundamental difference between faculty and student perceptions of the goals or purpose for field methods courses. A trend toward the development of employment skills, and career development, particularly in applied fields, currently exists among many American university students. The purpose of a university field methods course, however, should not be job training, or mere instruction in how to use certain types of equipment or technology. This was noted by Hart (1968) who, thirty years ago, stated that a field methods course should be dominated by the application of knowledge and techniques to geographic problem solving in the field. In practice, however, the relative decline in field methods enrollment is at least partly driven by students attracted to courses that involve the development and practice of

directly marketable technical skills. In the twenty-first century field methods will have to focus on the application of new technologies toward solving applied problems with geographical dimensions in order to maintain or re-assume a key position in university geography programs. Technology will continue to be essential in the discipline, but it is unlikely, for geographers in the foreseeable future, that the "virtual field" will completely replace virtually being in the field.

12.8 Recommendations

General calls for improving and increasing fieldwork opportunities or field methods instruction for geography students have yielded modest results. Recognizing this situation, the following specific recommendations are offered concerning field methods courses in the US.

1. The content of field methods courses should be critically examined and crafted so that both topics and practical applications strike a balance between the development of fundamental skills and introducing students to new technologies and methods.

2. Field methods courses should be maintained in a geography program in order to make better "geographers" of the graduates from that department. Field methods courses teach fundamental intellectual skills and develop experience in problem solving. Field methods courses often invigorate students in the major and make them more motivated learners.

3. Field methods courses enhance geographers' contributions to topics that can best be studied through fieldwork.

4. Because the textbook problem may not be solved through commercial publishers, course materials and readings should be made available through other means. This approach may be necessary because the market for commercial publication and distribution of learning materials is limited, as a result of small class sizes and enrollments in field methods courses. Professional organizations can develop and distribute such niche publications as a service to the discipline. Faculty can also share information, adaptable field activities, technological tips, and course notes through the Internet.

5. Future generations of geographers with an interest in teaching field methods should be mentored in the task by experienced faculty, and they should have an opportunity to serve as graduate teaching assistants in undergraduate field methods courses.

6. Geography departmental chairs should give strong consideration the benefits that students receive by learning in the field and by developing a proficiency in the application of geographic field skills. Faculty involved in field teaching should receive adequate support from the department and administration to encourage involvement in the teaching of these labor-intensive courses. The goal of field methods courses is to develop future geographers who can conduct or supervise field research or applied field studies, not merely master the use of equipment.

12.9 Acknowledgements

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13. REPRESENTING SPATIAL COMPLEX SYSTEMS

Geographical education facing post-modern society

ADALBERTO VALLEGA

13.1 Introduction

In the course of the 1970s modern society declined and post-modern society took shape. The transition to the new social organisation was marked by profound changes in the world picture and role of science. Discussions about the environmental question and the global change concept had two consequences: the environment was internalised into political designs; the approach to the Earth and to its world began by focusing on the global scale of issues and prospects. The conventional paradigms of science, based on positivist and structuralist cultural backgrounds, were confuted and the search for a new speculative basis catalysed increasing efforts from disciplines. In the early 1990s both the processes entered a turnaround phase during which post-modern society acquired the features of its maturity. The vision of global change was referred to the Earth's ecosystem through which the sciences of life acquired leading roles. Those disciplines which were stimulated to replace positivist and structuralist approaches were attracted by two epistemological routes traced by complexity-based thought and post-modernist criticism. Geography has been particularly involved in this process.

At present, geographical education, where it is framed in this context, seems to be committed to a basic option between two epistemological routes, namely the post-modernist and the complexity views of the world, which have led to different ways to understand places and spaces. At present, critical attention merits being concentrated on the prospects opened by complexity's thought since the implications for geographical education from the post-modernist approach are still not clear. The complexity-based approach emphasises the role of geography as a science able to make representations of spatial realities thereby building up models in an epistemological sense, i.e. as non-objectivist representations establishing interaction between the individual realities and a general model. This approach leads to the rejection of Cartesian logic and the adoption of conjunctive logic based on the principles of pertinence, holism, teleology and aggregation. This logical background seems to be the only one able to design

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educational profiles and professional skills responding to the demand for geographical assessment and knowledge arising from the spirit of the Rio de Janeiro Conference.

A key problem is primarily that of deciding how geographers can support inter-disciplinary approaches to education in such a way as to ensure those holistic views of spatial realities which are connatural to present society. If the complexity's view is adopted, geography may be regarded as a leading *engineering discipline*, i.e. a leading component of the group of disciplines—from architecture and music to political and juridical sciences—which are concerned with the building up of models of reality and social organisation. In this context, geography is essentially involved in using its background to produce common epistemological bases to integrate natural and social sciences thereby building up systems of knowledge. From this fascinating prospect some obligatory challenges may be dealt with by geographical education: to act as a leader in the inter-disciplinary discourse, and as a leader to implement and use correctly geographical information systems; to provide sustainable development-referred representations of the world on any scale, and culturally-sound and ethically-motivated representations of the "local systems-global processes" interaction; to implement global networks with the aim of optimising international co-operation on education; to improve and diffuse distance learning methods and techniques; to strengthen the social and individual sense of *being-in* and *being-for* the cultural heritage of spatial realities.

As Buttimer (1993) stated, four approaches to places and spaces have taken shape in the history of geography: *ergon* (responding to social and scientific stimuli), *poiesis* (discovering and creating), *logos* (systematising), and *paideia* (educating). These may be regarded as the components of a mandala where education is both its starting and its ending point. Within this mandala, geographical education will become increasingly important because it is going to mirror the option between the systematic and creative routes of geography and may be the experimental arena where the crossing points between these routes may be located and experimented. As a result, the agenda of educational geography may include discussions on the epistemological bases, impacts from society and science, prospects of globalising tools, and the sharing of experiences and lessons while protecting the local cultural heritage as a key resource.

The conceptual approach presented in this paper is supported by the concise presentation of the results of some geographical fieldwork which has acquired increasing importance as a consequence of both the increase in assessment needs triggered by Rio Conference, and the adoption of holism-based epistemological routes in considering the spatial manifestations of interaction between human communities and the ecosystems.

> *Education, including formal education, public awareness and training should be recognised as a process by which human beings and societies can reach their*

fullest potential. Education is critical for promoting sustainable development and improving the capacity of people to address their environment and development issues. (...) Both formal and non-formal education are indispensable for changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making. To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human, which may include spiritual, development, should be integrated into all disciplines, and should employ formal and non-formal methods and effective means of communication. (Agenda 21, 36.3)

13.2 Inputs from the post-modern context

Since the 1970s geography has been involved in a chain of relationships rich in cultural and scientific sense. Both changes in reality, particularly in social organisation and in science, led geography to deal with a much wider and complicated framework of subjects than in the past. As a consequence, to use the significant image presented by von Foerster in *Observing Systems* (1981), it seemed an increasingly weak discipline. Meanwhile the prospects of geography were enlarging to the point of making it one of the most useful disciplines for providing views of the world and dealing with complex reality. With changes in society, geography's location in the scientific arena and the geographers' agenda have been the points of an epistemological triangle which is far from becoming stable. This process has involved geographical research and education contextually bringing about an unprecedented interaction between these two cardinal routes of geography. To foresee possible evolutions, the social and scientific changes which have given such importance to geographical education may be taken into account.

Changes in society began in the early 1970s when modern society entered into its declining phase and post-modern society took shape. The rise of a new international division of labour, the environmental question, and influential inputs from computer science, information and communication systems were triggering factors. During the 1970s and 1980s society and science were stimulated to produce speculative approaches and research settings to respond to those inputs. In the early 1990s another much more influential wave of factors, based on the adoption of the sustainable development concept and the rise of globalisation processes, imposed new changes and led post-modern society towards its maturity. To find similar processes it is necessary to go back to the 1760s-1780s, the period of the initial inputs of the First Industrial Revolution, and to the 1880s-1900s when modern society entered its own long maturity (Table 1).

Where this historical view is accepted, two ranges of inputs to geography brought about during the take-off and maturity phases of post-modern society may be found, and impacts on geographical education may be designed. Finally, the routes along which geographical education may sail, may be drawn.

Table 1. Modern and post-modern societies

Societies	*Phases*	*Duration*	*Triggering processes*
Modern	take off	1760s-1880s	First Industrial Revolution
	maturity	1880s-1970s	Second Industrial Revolution
Post-modern	take-off	1970s-1990s	New international division of labour Limits of growth-inspired policies Environmental protection policy Socialisation of computer use Focus on global change Earth's monitoring from space
	maturity	1990s and beyond	Trans-national economic systems Human development-inspired policies Sustainable development-inspired policies Globalisation processes Information global networks Ecosystem's protection policy Management of mankind's common heritage

In the early 1970s two events jolted modern societal organisation. First, the unpredicted rise of oil prices, due to the Organisation of Petroleum Exporting Countries (OPEC), provoked profound changes in the international raw material market and triggered new patterns in the international division of labour. As a result, policies stopped being supported by the stable conditions established by the Bretton Wood agreement (1944). Secondly, the United Nations Conference on the Human Environment (Stockholm, 1972) designed international co-operation and national policies to deal with the environmental question, and therefore the environment was internalised into political equations, strategies and programmes. The latter input was a tremendous counterblow to human geography. Since the late 1950s this discipline had been focusing on the analysis of location and spatial distribution and in that it was profoundly influenced by structuralism. After the 1972 Conference it was asked to return to the so-called "vertical co-ordinate" of the world's vision by concentrating attention on the spatial manifestations of the interaction between human communities and the environment.

Meanwhile, the use of *Landsat* satellites (*Landsat I*, 1972) gave a different view of the Earth, and with it useful data was systematically provided for global scale monitoring.

The awareness that the environmental issues need to deal with the Earth's system as a whole led to the global change concept, intended as climate change and subsequent impulses on the biogeochemical cycles. The global change-concerned international research programmes, convened in the 1980s by the International Council for Scientific Unions (since 1998 International Council for Science) tried to respond to this demand for assessment and to sustain political approaches through new scientific settings. Hence geographical education was stimulated to create educational approaches sensitive to the interaction between human communities and the natural environment, and to design global views of the world focusing on the main concerns of mankind. In this perspective, a chain of inputs arose: remote sensing has provided an increasingly large amount of data that computers were able to process; new kinds of mapping techniques have been successfully experimented; geographical education was encouraged to use these intriguing new tools for designing cultural backgrounds and professional skills.

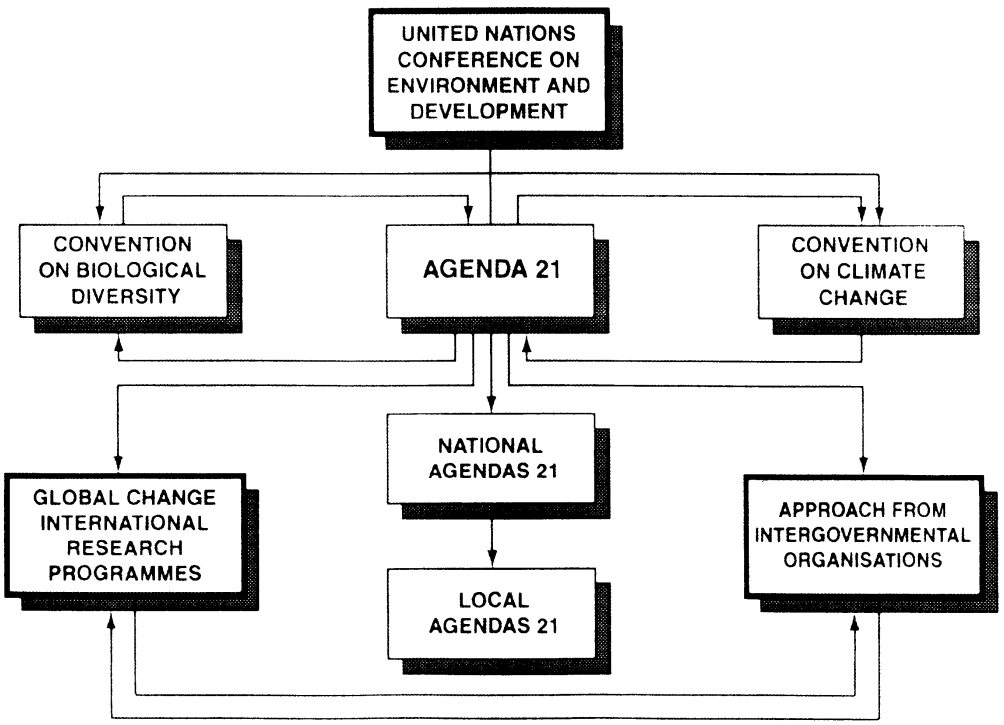

Figure 1. The output from the Rio Conference and the interaction between research and policy.

These inputs were so intense as to lead to the confuting of positivist and structuralist thought, and to the search for new knowledge organisation able to meet the changing demand for assessment and understanding. In the course of the 1970s and 1980s

influential responses were given by the general system theory, essentially rooted in the Von Bertalanffy's thought (1968) and sensitive to inputs from biology.

During the 1990s, new impacts on geographical education have derived from the factors leading post-modern society to its maturity. They were so influential as to justify stating that the "educational question" of geography arose and took shape in this decade. Two inputs may be regarded as pivotal for education.

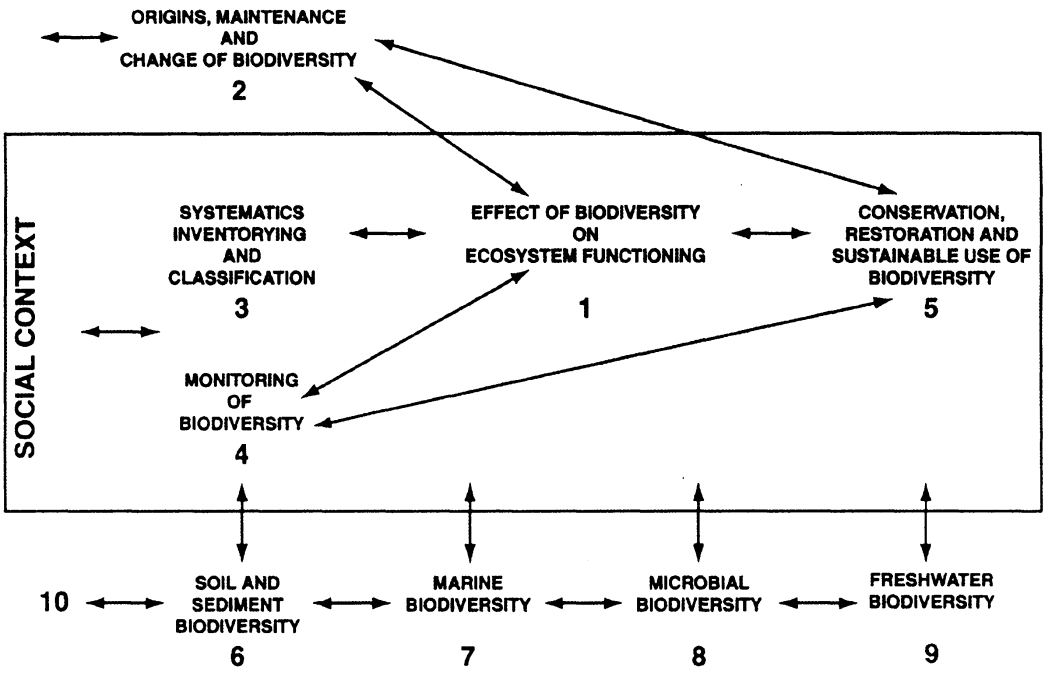

Figure 2. The conceptual approach to the ecosystem, consistent with the need to focus on biodiversity and the feedback between the ecosystem's biocenosis and social contexts. This approach was adopted by the Diversitas programme, convened in the framework of the International Council for Science.

The *United Nations Conference on Environment and Development* (UNCED, 1992) asked the scientific community to provide settings sensitive to the sustainable development concept, to focus on the ecosystem as the heart of environmental protection, and to design holistic views of reality with the aim of optimising both the social perception of, and political approaches to issues and prospects. The sustainable development concept, being regarded as the contextual pursuit of the ecosystem's integrity, economic efficiency and social equity, has stimulated geographical approaches, including educational, to focus on spatial expressions of interaction between ecological, economic and social processes. This need was emphasised in many parts of Agenda 21, where the need to set up holistic approaches by both scientists and policy-makers was claimed as essential for the pursuit of sustainable development. The holism

concept has triggered off epistemological concerns, profoundly involving education, all of which will be discussed later on. To assume the ecosystem as the key reference for both Nature's assessment and environmental management was probably the most important input from UNCED. As a result of the 1972 UN Conference, during the 1970s and 1980s attention was centred on the environmental degradation provoked by pollution and other human inputs, and therefore physical and chemical processes were put into the focus of both research and education. The consideration of the ecosystem, defined by the Convention on Biological Diversity (1992) as a system including trophic webs and their abiotic niche, has led geographers to building up scenarios tailored to the spatial expressions of biotic organisation and to establishing links with sciences of life, therefore bringing about intense impact on educational approaches. Meanwhile efforts from the United Nations Development Programme (UNDP) to implement policies sensitive to human development have stimulated social geography to design new approaches, sensitive to ethical values and the cultural heritage, thereby widening the educational horizon.

New routes of geography:
Approaching the ecosystem

As a consequence of the approach from the Convention on Biological Diversity and Agenda 21 (essentially chapters 11 to 16), the scientific approach has turned from the physical environment to the ecosystem considering the consequences of the associated changes in the lower atmosphere and of human impacts. Geographers have been encouraged to investigate the spatial manifestations of this interaction bearing in mind the need to protect the integrity of the ecosystem which, in practical terms, means protecting their productivity, diversity and resilience. As is shown in Figure 2, biodiversity may be considered as the key element of the ecological reality necessary to understand the feedback involving the ecosystem and social organisation.

In this framework, a wide range of issues has arisen implying close interaction between social and ecological sciences and requiring to be dealt with also in a geographical perspective.

Classifying and mapping the ecosystems—On the basis of their background in regional analysis, geographers are expected to contribute to the classification of the ecosystems on the various scales (global, meso-regional, and regional), and to provide methods to identify the spatial extent of the individual ecosystems, and to map them. These maps, when compared with those concerned with settlements, natural resource uses and the stewardship of decision-making systems, may lead to understanding how and to what degree human communities have influenced the ecological contexts, and how the optimum ecosystem's management may be designed.

Building up indicators—Efforts have been concentrated on designing and experimenting useful indicators for monitoring and evaluating biodiversity, productivity, resilience and other properties of the ecosystems, as well as the human

pressure which they have undergone. Geography may contribute to this work by designing and experimenting indicators aimed at evaluating the spatial manifestations of the human pressure on the ecosystem, relating population density, resource use, economic organisation, and social behavioural patterns to the ecosystem's properties.

Designing the ecosystem management science—Co-operation between sciences is expected to lead to the design of the ecosystem management science, intended as a particular approach to land and ocean use management and planning, sensitive to the ecosystem's integrity. The long and intense geographical experience in investigating the interaction between human cultures and the natural environment may play an important part in pursuing this goal.

During the 1990s *globalisation processes*, essentially recognised by the creation of global networks and the diffusion of information and communication tools, have unexpectedly increased the access to data and materials of every kind. As a consequence, human communities have been enabled to build up global views of the world, and to implement their relationships. The dialectic between the local systems and the global setting has initiated. The rise of virtual realities has profoundly changed the sense of the world's representations thereby triggering discussions about the role in mapping and its geographical language. Geographical education has been increasingly stimulated to provide room for the creativity of students, and their imagination.

13.3 The epistemological discourse

The inputs from the rise of post-modern society have led to focusing on the epistemological concern. Because of its direct and close relevance to geographical education, this key aspect merits being discussed. It could be stated beforehand that, despite interesting efforts (Claval, 1980), discussion about the epistemology of geography has not still adequately developed, particularly as regards its interaction with the epistemology of science *per se*. The recent influential book *Rediscovering Geography* (1997) by the Rediscovering Geography Committee of USA National Research Council (1997, 44-46) has given a view of geographical epistemologies as embracing post-Marxist, realist, interpretative, feminist and postmodernist approaches. Following von Foerster (1985, 116), ontology (explanation of the world's nature) and epistemology (explanation of our world's experience) should be kept separate. Hence it could be stated that epistemology explains the nature or our experiences of the world. In this context, experience is the cause, the world is the consequence, and epistemology is the rule for transforming our experience and the consequent world picture. This thought leads to designing epistemological approaches differing from those of the mentioned geographical work, and focusing on the scientific experience of the world. In this respect, it could be useful for discussing geographical education, as well as the role of geography as a whole, if scientific experiences triggered by rational mechanics,

thermodynamics, structuralism, general system theory and complexity were to be considered. Assuming the approach by Le Moigne (1977) as the key reference basis, the pathway shown in Table 2 may be followed.

Table 2. Sequence of epistemological designs

Time	*Epistemologies*	*Reality as consisting of*	*Geographical logical approach*	*Basic ontology*
19th century	Rational mechanics	Structures acting as trivial machines (*) and generating functions.	Cartesian logic	Realism and objectivism
1910s-1940s	Thermodynamics	Structures acting as trivial machines and evolving.	Cartesian logic	Realism and objectivism
1950s-1970s	Structuralism	Structures acting as trivial machines, generating functions and evolving.	Cartesian logic	Realism and objectivism
1970s-1980s	General system	Structures acting as trivial machine, directed to objectives and interacting with the external environment.	Cartesian logic	Realism and objectivism
1990s onwards	Complexity	Systems acting as not trivial machines, self-organising, passing through changing phases by interacting with *their* external environment, and thereby moving towards objectives	Conjunctive logic	Not realistic, basically accepting Maturana's approach to "mutual consensus".
1990s onwards	Post-modernism	Personal and social images of the world.	Neutrality to the logical dimension	Essentially solipsistic

(*) A trivial machine is intended as a structure always reacting in the same way to the same kind of impulses. It is a product of deterministic approaches since its future is conceived as determined by its past and thereby is predictable. A not trivial machine is a structure reacting in different ways to the same kind of input. It is the product of a not deterministic approach to the world since its future is conceived as not determined by its past, and thereby it is not predictable.

There is no room to discuss the individual components of this epistemology, but there could be consensus on the fact that the rise and maturity of post-modern society is marked by efforts to overcome both positivist approaches, essentially reflected in the epistemologies of rational mechanics, thermodynamics and general systems, and structuralist views including those linked to Marxist bases. As a result, the present main options, which natural and social sciences are dealing with, seem to refer to complexity and post-modernist thought. These may be regarded as the starting points also for outlining the discourse of the future of geography.

In this respect, it is obvious that both epistemologies (complexity's thought, and post-modernism) have the potential to build up educational approaches embracing backgrounds, methods and techniques, at least for the trivial motive that any epistemology brings about education. Nevertheless, at present, attention merits being concentrated on complexity thought for at least three reasons. First, the demand for education arising from Agenda 21 and operated at any level—from the inter-governmental organisation to the national educational systems—is concerned with concepts and principles to which only a complexity-inspired approach may respond.

The holistic and sustainable development-referred views at every step of Agenda 21 are significant examples of this circumstance. Secondly, the global change concept may be harboured within the thought by considering reality as consisting of complex systems while it has no evident potential links with post-modernism. Third, complexity's epistemology is endowed with clear and well-defined logical bases. As a consequence, the prospects opened up by complexity's thought on geographical education may be considered here.

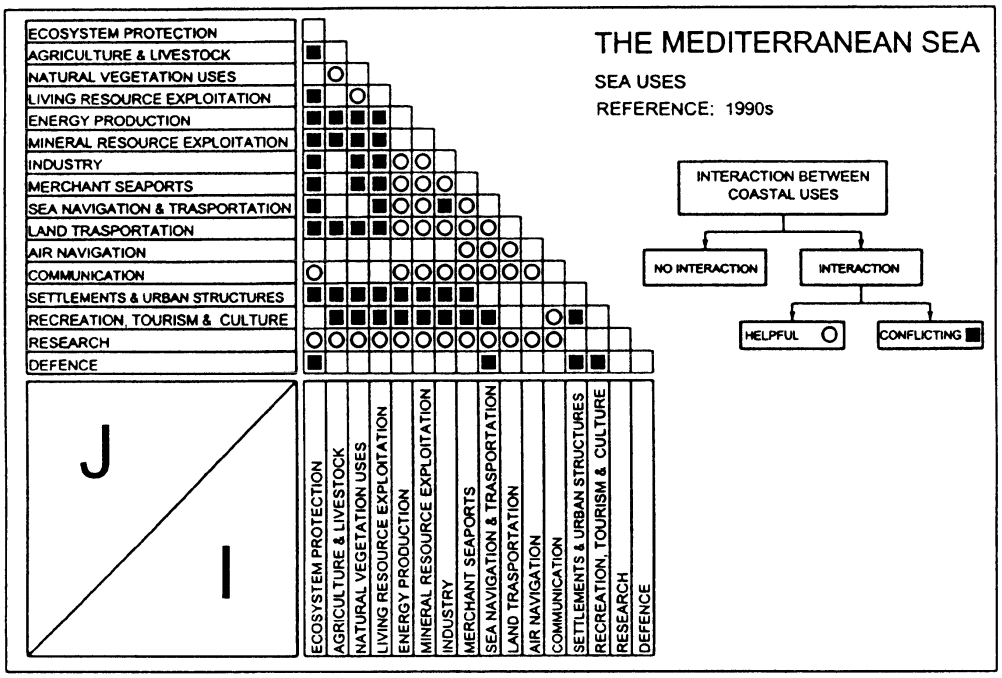

Figure 3. Categories of resource uses and economic functions marking the spatial organisation, and their mutual potential relationships. The case of the Mediterranean.

13.4 The epistemology, logic and methodology troika

Despite what could have been conceived, the complexity's epistemology not only differs from that of the general system but is in conflict with it in many respects. The basic reason is due to the difference between the concepts of system and complex system. A system is an objective structure that may be described exhaustively and according to objectivism-sensitive criteria: it presupposes the vision of reality *per se*. Differently, a complex system is a system that cannot be described in an objectivist way but only be represented according to the goal of knowledge and the general vision of the world harboured in the mind of the subject. As a consequence, knowledge through complex systems has been solidified by the building up of models of reality. Rightly Le Moigne

(1990) considers epistemology as the science and art of modelling (from French *modelisation*). This approach is stimulating for geography since this discipline has always been concerned with the representation of the territorial realities (Haggett and Chorley, 1967; Woodward, 1992). It has the potential to exalt this prerogative and to open fascinating prospects. In this respect it should be noted that the concept of model used by the complexity's thought has no links with that used in structuralist geography (Willmott and Gaile, 1992): the former is the product of an epistemological approach, while the latter is the product of methodology.

Within the complexity-based epistemology a circular relation comes to the fore. The general vision of the world inspiring the individual model reflects the *project of the world* which is in the subject's mind: it is the product of an explicit or implicit goal-oriented. As a result, the individual model, *including any geographical representation*, hides a project. The building up of projects concerned with individual realities influences the designing of the idea of a general complex system. As a result, knowledge and action emerge as closely linked and, as been mentioned, epistemology acquires the role of explaining how the transformation of reality is in fact the transformation of our model building. Where this approach is accepted, the main consequence, profoundly influencing education, involves logic and methodology: epistemology reflects on logic, logic reflects on methodology. Changes in logic needed by complexity are rather traumatic because they imply rejecting Cartesian logic, on which the science of modern society was based, and they lead to adopting opposing backgrounds the final results of which are neither certain nor wholly predictable. As is emphasised in Table 3, the transcending of conventional logic is liable to have extended and profound consequences for science as a whole, and particularly for geography.

The starting point is the awareness that producing objective knowledge, as well as knowledge *per se*, is illusory. Knowledge is always functional to the pursuit of an objective and, in the case of geography, always relates to the building up of spatial projects. This circumstance justifies the need to make the objective of knowledge clear in such a way as to open the way to evaluation and confuting procedures.

Table 3. Conjunctive *versus* disjunctive logic

Disjunctive logic	*Versus*	*Conjunctive logic*
Output: Cartesian thought		*Output*: complexity's thought
	Principles	
Evidence Describing only those elements that are clear and self-evident.		*Pertinence* Describing those elements that are perceived as valid to the building up of reality's models.
Reduction Desegregating the components of reality, then describing the individual elements, separately.		*Holism* Describing reality as a unique system interacting with its external environment. Considering detailed knowledge of reality as not useful for knowledge.
Causality Supposing that the behaviour of the individual elements is regulated by cause-effect relationship. Moving from the simplest elements of reality towards the most complicated.		*Teleology* Leaving out the existence of a cause-effect relationship between the elements of reality. Focusing on feed-back and circular relationships. Considering the evolution of reality with reference to its project, i.e. the goals which are pursued through its organisation.
Exhaustiveness Assessing all the elements of reality in detail. Ensuring that nothing has been left out. Postulating that the subsequent knowledge is objective only where these conditions are met.		*Aggregation* Selecting those elements which pertain to the building up of models representing systems as a whole according to the project they operate. Being aware that knowledge is relativist and partisan *per se*.
	Resulting methodological attitudes	
Analytical-deductive methods	*Versus*	Axiomatic-inductive methods

This approach, which mirrors the principle of pertinence, implies designing the sets of elements relevant to the knowledge to be constructed, and concentrating on these while no longer pretending to be able to investigate everything. This, expressed by the principle of aggregation, has severe consequences for geographical knowledge. For example, the production of regional monographs—such as those conceptualised by the Vidalian approach and inspired by the reduction principle—is thought of as logically inappropriate. Nevertheless, worse consequences may derive from the application of the teleology principle, since this leads to abandoning the tendency to explain geographical realities by reasoning in terms of cause-effect relationship. The revolutionary role of this approach, and the difficulty in adopting it, derives from the circumstance that, at present, human geography is stimulated to deal with the spatial manifestations of the interaction between the ecosystem and social contexts, therefore abandoning its

conventional approach, solidly-based on the causalism principle. The logical conflict between the investigation of the social and the natural components of spatial complex systems, triggered by the teleology principle, would be crucial. Even more revolutionary would be the holism principle, according to which complex systems may only be comprehended (from the Latin *cum*, and *prehendere*: get together), and not be merely explained (the Latin root is *ex*, and *plicare*: unfold, fold up) according to cause-effect reasoning (Morin, 1986, 144). It leads to designing the complex system as a whole. The key question is not "how the system is made" but "how the system works, and towards which objective it moves". This word, holism, had also a pivotal role in designing the UN approach to sustainable development and, as mentioned, it supports most of the political guidelines expressed by Agenda 21. While sailing along this route the geographical interest shifts from considering the spatial structure as the key subject towards focusing on the territorial organisation. This implies shifting from the elements and their relationships, in which geography has been involved in the last decades, towards the interaction between the social and ecological contexts with the final aim of representing how the organisation, resulting from interaction, changes. Reality appears to be constituted by self-organising systems or, using Le Moigne's image (1990, 73-7), as systems organising their organisation without interruption, therefore playing an endless game. The key geographical role comes to represent reality by models: on the *global scale* the building up of the world's visions arises; on the *regional scale*, representations give shape to visions of interaction between large spatial systems and their external environment, i.e. the world context; on the *local scale*, representations provide visions of the local-global interaction (Meyer, Derek, Turner II and McDowell, 1992). *Inter alia*, in this context the geographers' ability to carry out investigations concerning both the time and space scales and involving two or more spatial scales, would be exalted.

New routes of geography:
Approaching economic organisation

There are two reasons for which holism is a cardinal point of reference for assessing geographical realities: Agenda 21 selected it as the key criterion on which sustainability-aimed political approaches have to refer on any scale; the attempts to overcome the reduction principle and subsequent sectoral views have insisted on the use of this concept in order to create systems of knowledge. To respond to this need, geography is encouraged to abandon sectoral descriptions of spaces, based on distinct investigations of individual branches of the economic organisation (agriculture, industry, trade, and so forth) and social context (education, health, ethnical features, and so forth), and to provide global views of the spatial systems on the various scales, from the regional to national and local.

In this perspective a useful means is to use square matrices where the resource uses and the individual economic and social sectors are presented in both rows and columns in the same order, and the types of interaction, beneficial or conflicting, between uses are indicated in boxes. This simple model representing the web of

relationships may serve as a basis to identify economic and social organisational patterns, consisting of sets of use and the sets of relationship between uses (Vallega, 1996).

An example of matrix, where the resource uses are ordered according to the components of sustainable development (integrity of ecosystem, economic efficiency, and social equity), is shown in Figure 3. Among others, this approach has been successfully used by geographers involved in investigations of coastal regions with the aim of designing integrated management programmes recommended by Agenda 21.

13.5 Focus on education

The epistemological framework, marked by reality's designs transcending positivism and structuralism, and by the difficulty in transcending disjunctive logical backgrounds, also reflects on how we see science. According to positivism, and even more structuralism (Piaget, 1967b), science is based on sectors each with its own justification in terms of both goals and methods of research. The partition between physical, legal, and social sciences is a basic consequence of this approach. Differently, complexity-based epistemology has led towards another view considering the individual disciplines on the basis of their role in building up systems of knowledge. In this respect, Le Moigne (1990, 153-66) designed a framework opposed to the conventional one where disciplines are framed into four groups—sciences of matter, life, movement and engineering—crossed by sciences providing epistemological, logical and methodological backgrounds. The relevant framework is shown in Table 4.

Table 4. The system of sciences (*)

Sciences of matter	*Sciences of life*	*Sciences of movement*	*Sciences of engineering*
Chemistry	Psychology	Electricity	Archaeology
Geology	Cognitive sciences	Mechanics	Geography
Oceanology	Social sciences	Dynamics	Musicology
Electronics	Medicine	Energetics	Architecture
Magnetism	Neurology	Hydrodynamics	Technology
Astrophysics	Biochemistry	Thermodynamics	Computing sciences
	Behavioural sciences	Evolution sciences	Management sciences
	Ecology		Political sciences
			Juridical sciences
			Organisation sciences

Crossing sciences

Mathematics	Logic	Noology	Hermeneutics	Epistemology

(*) Adapted from Le Moigne (1990, 61). The lists are only tentative and are sensitive to the scientific framework of the late 1980s.

In this framework, geography is regarded as an engineering discipline in that it is destined to design holistic views on various scales. Its ability to construct educational approaches based on fieldwork may optimise the building up of cultural profiles and professional skills aimed at integrating concepts and the views of individual spatial realities.

This problèmatique justifies stating that geographical education is stimulated to change its approach and to strengthen its impacts on society. Its primary role lies in teaching the representation of complex territorial systems. As a result, its traditional function, i.e. mapping, is implemented by adopting the function of representing spatial realities according to constructivist logical backgrounds sensitive to the holism, aggregativeness, teleological, and pertinence principles. The positivist and structuralist approaches consider representation as complementary to description while the complexity-based vision leads to considering representation as the key to geographical work. Educating to represent territorial realities while warning that representation consists of building up models of something that cannot be known exhaustively and objectively is the basic challenge, and the most fascinating geographical perspective. This is the reason why geography is expected to acquire a leading role in post-modern society, and geographical education is expected to have a pivotal role in inter-disciplinary educational systems.

In this perspective, it should be noted that the structuralist-based approach (Piaget, 1967a, 1972) has been marked by efforts to classify disciplines and considering science as consisting of a range of disciplines belonging to the physical and social areas each having its own internal and external epistemology. Following this approach, the relationships between disciplines were assumed to be very weak. Practically, they only consist of the convergence of two or more disciplines in dealing with subjects endowed with multi-disciplinary relevance. The key word is "assembling", which is very different from "integrating". Efforts to overcome that approach—which led to the ambiguous concepts of multi-, inter-, and trans-disciplinary approaches—have been made in the framework of complexity thought.

General-system theory: search for isomorphisms—As is well known, the general system paradigm was proposed by Von Bertalanffy (1968) not only as a general view of reality but also as a general approach from science. The starting basis for that was essentially due to the need to integrate biology, which was entering into an intense development phase, with other sciences. That brought about two situations, both deeply influencing the recent evolution of epistemology. *First*, the input to confute and overcome positivism and structuralism, which were catalysts in the previous decades, arose from the natural sciences. The social sciences reacted some years after that approach, although their contributions have been so intense as to lead to the concept of the

complex system. *Secondly*, the initial input was generated by a discipline, i.e. biology, which in itself is not sensitive to the determinist view of Nature, and therefore makes progress *vis-à-vis* the physical sciences.

The epistemological approach triggered by the theory of the general system led to the concept of isomorphism as a tool to transcend inter-disciplinarity regarded as a mere assembling of disciplinary contributions. Basically, the isomorphism is an individual concept used by various disciplines, natural and social, which attribute the same meaning to it. For example, the concepts of structure, process, feedback and adjustment, and progressive segregation are the theoretical instruments through which both nature and society are described and investigated. Moving from that basis, inter-disciplinary approaches have been regarded as correctly adopted only where isomorphisms have been used because only where this arises is there a mutual language and a mutual view of reality. There is no doubt that the isomorphism endowment of the general system theory was provided by natural sciences and, as a consequence, the social sciences would have been quite reluctant to accept it. Nevertheless, it was able to drive the discussion on inter-disciplinarity towards a new frontier which was much more attractive and rich in consequences for both research and education than the positivism- and structuralism-based approaches had been able to be.

Epistemology of complexity: at the roots of the issue—According to the thinking of complexity, inter-disciplinarity is effective when a mutual epistemological and logical background is accepted and used by the disciplines concerned. This mutual background essentially consists of considering the building up of knowledge systems as deriving from the interaction between reality, the general model of reality and the model of the individual reality considered. In short, the mutual basis exists where knowledge is regarded as consisting of the building up of representations of reality. These representations are isomorphic as regards the general model because all the final individual models reflect the same general model, and are omomorphic as regards reality because this may be represented by a plurality of models. It should be remembered that, according this view, the general model of reality represents a system interacting with its external environment, and moving towards an objective undergoing adjustment and morphogenetic phases.

When this approach is adopted, geography is stimulated to acquire a cardinal role in constructing inter-disciplinarity at least for two reasons: a *general epistemological reason* since by its nature it has the special ability of representing complex realities, and has developed extended discussion on the role of representations in assessing spatial contexts; a *specific epistemological reason* because geography has always had a bridging role between social and natural sciences, and has acquired the ability to integrate views of human organisation and ecological contexts. Recently, this ability has been widely

acknowledged as a result of two inputs. First, investigations on global change have led to emphasising the need to focus on the interaction between climate change and subsequent changes in biogeochemical cycles, and in social organisation. Geographers have been invited to contribute to deal with this subject by building up models of the relevant spatial expressions. For example, where changes in coastal areas due to both sea-level rise induced by climate change and to the increasing human pressure need to be investigated, geography is usually asked to play the role of science integrating different disciplinary approaches. Secondly, guidelines from Agenda 21 may be operated only if holistic views of spatial systems integrating contributions from natural and social sciences are provided. This is the reason why many geographers have been involved in research and education programmes inspired by this need.

New routes of geography:
Focus on human pressure

Traditionally, the geographical approach to population has essentially consisted of investigations into the spatial distribution of human communities, their structural dynamics and movements, as well as their ethnical and cultural features. Where sustainable development is regarded as the reference point of geographical investigations, attention turns to the human pressure, intended as the impacts exerted by population growth and concentration on the ecosystem and its resources, the landscape and cultural resources.

This approach leads geographers to focus on the carrying capacity of the individual places and spaces especially where the population increase, and resource use expansion have brought about a critical situation jeopardising the prospect of achieving sustainable development. As an example, the coastal areas may be considered. A very simple indicator may consist of the ratio between the world population and the length of the world coastal areas. At the beginning of the twentieth century, there were 2,700 inhabitants to each coastline kilometre; after the World War II, there were 3,900 inhabitant; in the early 1970s, when the roaring decades of modern society were ending, this pressure was expressed by 6,300 inhabitants; when the Rio Conference was celebrated (1992), they were 9,000; and at the end of the century they reached the peak of 11,200. Consequently, in the course of the twentieth century, human pressure increased more than four times, and 2.3 times after World War II. Meanwhile coastal areas have become the most attractive spaces for tourism and recreational uses, and seaports, manufacturing areas and cities have expanded.

As may be seen from the map shown in Figure 4, a key manifestation of this increasing human pressure has consisted of the creation of increasingly expanded urban systems. To focus on this spatial process, geographers have proposed the concept of "megacity", defined as a city with at least eight million inhabitants. Coastal megacities have increased from seven in the early 1970s to thirteen between the 1990s and the end of the century, and are expected to be twenty by 2010, including sixteen concentrated in inter-tropical developing countries. There is no doubt that this could cause a nested set of issues increasingly involving coastal

world governance: pessimistic scenarios could lead to designing these monstrous urban organisms as possible detonators of planetary crises.

These spatial processes show how wide and demanding has become the role of geography not only because conventional geographical subjects, such as tourism, have gained increased importance, and new subjects, such as megacities (Nicholls, 1996), have come to the fore, but also because this science has been asked to implement holistic views of spatial systems, and meanwhile to commute between the various spatial scales with the aim of focusing on the interaction involving global frameworks and local realities.

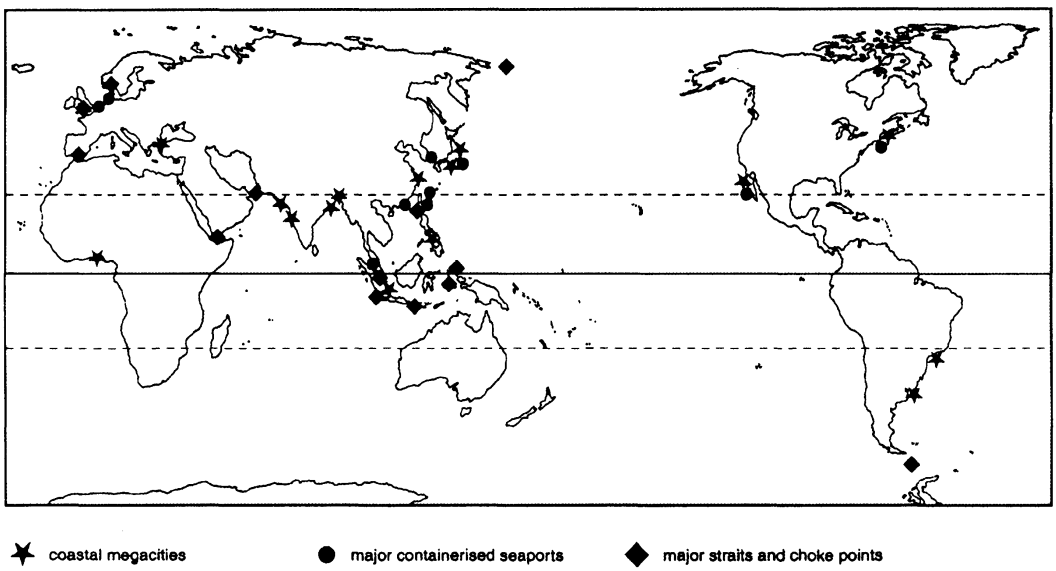

Figure 4. Features and factors of human pressure on the world's coastal areas: coastal megacities; major containerised seaports; major straits and choke points.

It may be expected that this wide range of inputs, even in the short term, will generate extended impacts on geographical education. Cultural profiles and professional skills will be increasingly based on inter-disciplinary assessment providing integrated visions of reality. Geography cannot only benefit from this trend by applying approaches integrating physical and human fields, but also by playing a leading role in the building up of inter-disciplinary, holism-inspired representations of spaces and places. Through the building up of systems of knowledge, its impact on the educational systems seems to be inevitable. If this is agreed, it follows that geography could usefully participate in discussions on inter-disciplinarity, intended as the epistemological arena to learn how to build up knowledge. This prospect was foreseen by the International Charter on Geographical Education adopted in 1998 by the International Geographical Union, which states that the "development of knowledge, understanding, skills, attitudes and

values constitutes the holistic process of education". That intuition, which preceded the adoption of Agenda 21, has been widely reinforced by the extended discussion on inter-disciplinarity and the need to deal with reality holistically. Hence, *the first challenge of geography is to act as leader in the inter-disciplinary discourse.*

New routes of geography:
The water cycle

A key implication from the increased human pressure on natural resources may be found on freshwater use and management, which is sensitive to both climate change and population growth. According to Agenda 21, Chapter 18, freshwater should be managed according to criteria useful for meeting both present and future human requirements, ensure water security and conflict resolution, and satisfy the ecosystem needs. As a consequence, the hydrographic basin should be regarded as the geographical unit of reference. This makes the issue very complicated due to the fact that, in many parts of the world, the individual hydrographic basins may be subject to the stewardship of a plurality of local authorities, and even a plurality of States. The discrepancy between various kinds of legal and institutional spaces is a potential factor in mismanagement of water use and conflicts between users.

In order to relate the pressure on the ecosystem to the water demand, a spectrum of indicators has been in use by geographers, including the water availability per capita, the *use-to-resource* ratio (the ratio of water use to renewable water resources), and the *import dependence* ratio, defined as the percentage of freshwater supplied by other countries, regions or places (Vallega, 1998). A mapping showing an application of these indicators may be found in Figure 5 where the Mediterranean is presented as a case study. As can be seen from the map, in this case the geographical approach is able to emphasise the discrepancy between the European side, on the one hand, and the African and Asian sides, on the other. A large part of the southern Mediterranean is subject to remarkable pressure on water uses, and some countries are affected by a high dependence on imported resources. This leads to focusing on the Mediterranean ecosystem, which has undergone growing human pressure. The key question is where the local ecosystems have been jeopardised by the increase and spread of resource uses, and where they are going to be affected by morphogenetical processes.

Also the evolving techniques of representation lead to foreseeing possible intriguing epistemological roles of geography closely concerned with educational contexts. The adoption of improved geographical information systems has given shape to three pivotal contributions to educational approaches tailored to represent spatial realities as complex systems. First, the ability to combine and integrate remote sensing and survey products, conventional maps and many other kinds of images including mental maps makes it possible not only to focus on the interrelationships between visions on different geographical scales but also to provide grounds to compare different cultural and social viewpoints. Secondly, the time scales may be taken into account more easily and efficiently than in the past because digital data allows the designing of spatial settings

concerned with different times but constructed with homogeneous methods and techniques. Finally, it is possible to simulate possible future settings by adopting non-deterministic approaches, and therefore stimulating creativity and imagination. How important this prospect has become for education as a whole is demonstrated by the great interest in geographical information systems arising from many other disciplines, from planning to sociology, from engineering to economics. Hence, *the second challenge of geography is to act as a leader in implementing and correctly using computer science-based educational tools*.

When Agenda 21 is considered it may be deduced not only that the social interest in geographical subjects has increased but also that geography has been encouraged to enlarge its research and educational arenas (Downs, 1994). In this respect, it is enough to take into account that Agenda 21 considers sustainable development as the contextual pursuit of (i) integrity of the ecosystem, (ii) economic efficiency, and (iii) social equity including the rights of future generations. This approach leads to advancing education along a plurality of routes: the ecosystem as a whole should be approached from a geographical perspective abandoning the conventional approach, and focusing on the physical context; the rational and ecologically-sound exploitation of living and non living, renewable and non renewable natural resources should be focused on from a geographical perspective abandoning the mere description of economic sectors; the components of the social contexts functional to the understanding of human development, as intended by the UN Development Programme (UNDP), should refresh the perspective of social geography; the spatial manifestations of cultural heritage management should be included in the geographer's agenda; finally, the geographical role of ethical values must also be dealt with. A long route is to be sailed to respond successfully to these impulses. Hence, *the third challenge of geography is to provide sustainable development-consistent representations of the world on any scale.*

Recently, geographical research has implemented investigation on the interaction between the economic, social and cultural backgrounds of local communities and globalisation processes. Two subject areas have been focused on: (i) the impacts from global networks providing information on the global scale, intensifying inter-personal and inter-body interactions, and stimulating the standardisation of economic organisation and social behavioural patterns; and (ii) the increasing inter-cultural communication triggered by international and local migrations, the rise and diffusion of multi-ethnic and multi-religion communities, and other similar processes.

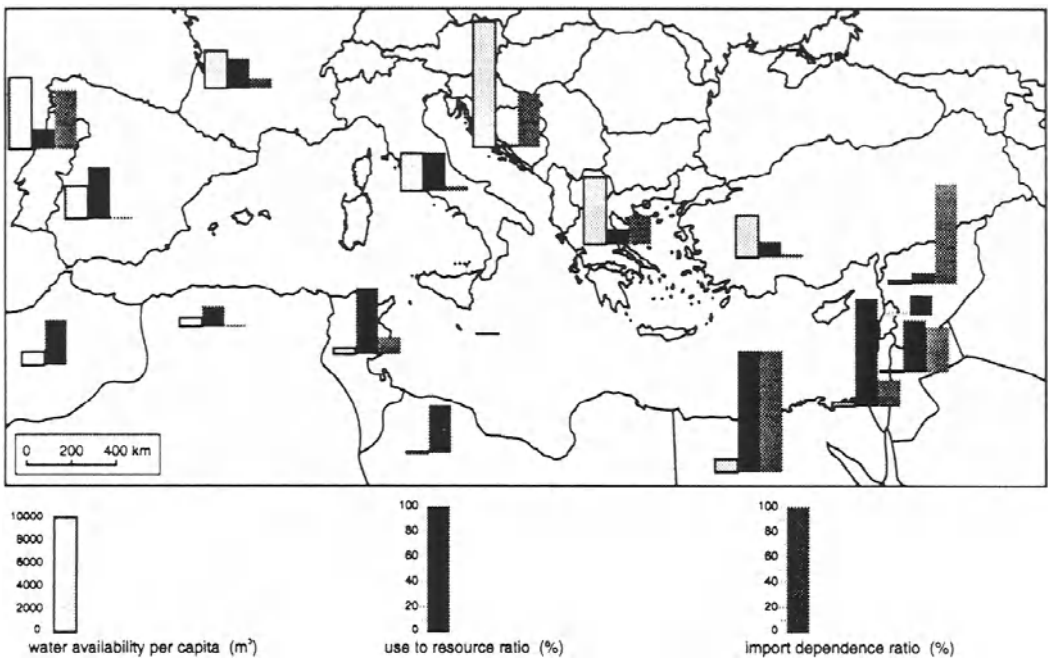

Figure 5. Fresh water management in the Mediterranean described by indicators: A, water availability per capita (m^3 per capita); B, use to resource ratio (%); C, import dependence ratio (%).

These aspects may renew and implement the geographical approach profoundly since geographers are implicitly invited not only to provide representation products of such spatial processes but also to tailor these to multi-ethnic and multi-culture communities. This task will be increasingly important because it will be inspired by both changes in reality and political impulses dealing with social integration and the protection of a local cultural heritage from globalisation processes. For example, one of the most binding political objectives, correctly designed by Agenda 21 (Chapter 17) is the protection of the biological and cultural diversity of small islands which have been increasingly jeopardised by globalisation-caused mass tourism, standardisation of economic organisation and banalisation of landscape. Hence, *the fourth challenge of geography is to provide culturally-sound and ethically-motivated representations of the local-global interaction.*

New routes of geography:
Human development indicators

The need to measure the degree to which sustainable development is achieved on the national scale was met by the United Nations Development Programme (UNDP) by designing the Human Development Indicator (HDI). Essentially, this indicator aims at providing a global estimate of the economic level and social standard in the individual states, and therefore it differs from the gross national product and similar indicators because it internalises social elements. HDI is calculated by considering four main types of variable: (i) life expectancy at birth, 24 years and 85 years; (ii) adult literacy; (iii) combined enrolment ratio; and (iv) the real gross domestic product per capita. It ranges from 0 to 1,000 making it possible to compare the individual states.

Moving from this basis a geographical fieldwork need arises consisting of the development of geographical investigations along two paths. First, the realities—such as youth and gender conditions, and ethnic stress—may be focused on with the aim of considering their roles in giving shape to the HDI of the individual state, and therefore social geography may acquire a well socially justified function. Secondly, HDIs on the sub-national scales, referring to the individual regions and spaces may be calculated moving from the national indicator, and the key relevant geographical factors may be focused on. An example of how the spatial desegregation of the HDIs may be useful for a better understanding of the conditions of social groups and spaces may be found in Figure 6.

Two parallel trends have influenced geography: the implementation of global communication networks therefore improving interaction between scientific and educational bodies in many regions of the world (Richardson 1992); the diffusion of interaction between globalisation processes and local systems in most parts of the world. These circumstances converge to provide useful room for implementing international collaboration between geographers involved in educational tasks. Collaboration may be concentrated on two arenas of mutual interest: sharing experiences, data and tools for designing educational backgrounds and courses; and optimising the social awareness of changes brought about by these processes, and the social ability to understand their impacts in the social, cultural and ecological contexts. Hence, the *fifth challenge of geography is to implement global networks aimed at optimising international co-operation on educational tasks.*

International co-operation is expected to be assisted by the improvement of distance learning techniques. A wide spectrum of tools, from websites to video conferences, implementing interaction has been experimented and has expanded. The decrease of transmission costs may give strong impetus to the use of these techniques, including its diffusion in developing countries. There could be advantages: improved co-operation between geographers who will be enabled to set up educational backgrounds and tools to be used on a multi-national scale; improved interaction between geographers and

educational systems, since geographical education may contribute to the building up of cultural profiles and professional skills. Hence the *sixth challenge of geography is to optimise its role in the improvement and diffusion of distance learning methods and techniques*.

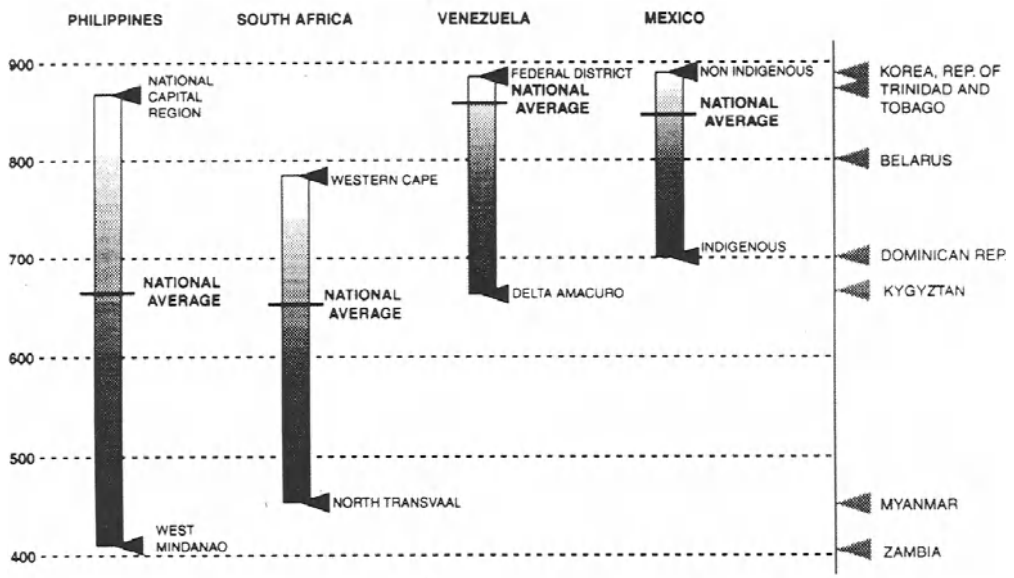

Figure 6. The Human Development Indicator of some developing states at mid-1990s. The graphic shows also how useful could be to refer HDIs to the individual regions, or the individual components of the social context (From UNDP, Human Development Report 1996, 31).

The geographical relevance of places and spaces is mostly due to the cultural values by which they are marked, and the social perception and awareness of this characteristics. The use of technologically advanced tools, such as the Geographical Information Systems (GIS), should not preclude this dimension of spatial realities into educational frameworks. There is a feedback between this and the development of creativity in students: the more the spatial realities are regarded as the signs of cultural values that have been sedimented over history, the more creativity is stimulated, and this brings about the awareness of the cultural dimensions of spatial realities. As a final product, education may contribute to give sense to the social behaviour in places and spaces. According to Heidegger's thought, it could be stated that the *seventh challenge of geography is to optimise the sense of being-in and being-for the cultural heritage of spatial realities*.

13.6 Sailing across two mandalas

Buttimer (1993, 15-19) presented the approach to places, spaces and cultural values materialised in landscapes as consisting of "four distinct constellations of vocational meaning (...) which are discernible in the career accounts of" geographers: *poiesis* (ποιμσισ; literally "creation") showing "geographic awareness, critical reflection, desire of discovering and creating; *paideia* (literally "education") marking the vocation and ability to educate to, and strengthen awareness of geographical realities; *logos* (literally "word, speech") denoting ability to build up systematic knowledge and explanation; *ergon* (literally "work, fact") indicating the tendency to designing and experiment geographical approaches to respond to social needs. For the purposes of Buttimer's investigations, which essentially consisted in monitoring the background supporting the geographer's role in the scientific arena, these four fields were discussed as individual components of geography's function in the present social and scientific contexts. Nevertheless, when attention is centred on education to implement discussion of the backgrounds by which it is supported and its role in the whole educational systems, these fields may be presented as linked by a circular relation: the evolving social and cultural contexts trigger responses from geographers; the need to give responses implements that of discovering and assessing; implementation of discoveries and assessment gives impetus to the design of systematic settings; the tendency to transmit ability to assess and to systematise the results of assessment is infused into that of educating. Therefore, *ergon, poesis, logos*, and *paideia* may be regarded as the berths along the geographical route. *Paideia* is the final berth but, at the same time, it is also that of departure because ability to respond to social needs, to discover, order and transmit results depends on the cultural profile and professional skills built up by education. Hence a mandala arises having key relevance to the future of geography in both science and society.

A more profound mandala takes shape when the essence of geographical education is considered. Building up geographical knowledge is marked by the option between the systematic and creative routes much more than other disciplines to the point of justifying stating that, to some degree, it sails between science, intended in an orthodox sense, and poetry in the etymological sense of creation. From a conventional view, this feature may be regarded as a weakening factor while, according to post-positivist and post-structuralist views, it may be considered as a sign of strengthening the differences in approaches to reality have been shown by Morin (1986, 182-4) as in Table 5.

These considerations lead to believing that, in the post-modern context, geographical education has gained importance without precedent for both endogenous reasons pertaining to its role in shaping the geographer of the next century, and exogenous

reasons relating to its role in developing educational systems essentially based on the ability to think globally and holistically.

If this is agreed, education merits being included in the geographers' agenda as a key issue, and discussions is expected to be primarily concentrated on impacts that may be expected on educational backgrounds and approaches sensitive to the various epistemological views. The sense and role of the epistemological option *vis-à-vis* education has been under-valued, therefore the need to strengthen efforts in this direction may be recognised as essential.

Table 5. Comparing the systematic and creative routes of thought

Systematic route	*versus*	*Creative route*
Distinction		Relation
Differentiation		Unification
Analysis (focus on elements)		Synthesis (focus on the whole)
Individualisation		Generalisation
Particularisation		Universalisation
Abstract		Concrete
Certainty		Uncertainty
Deduction		Induction
Particular Í general		General Í particular
Logic		Analogic
Logic		Trans-logic
Explanation		Comprehension
Separation		Participation
Objectivation		Subjectivation
Verification		Imagination
Rational		Empirical
Rational		Irrational
Rational/empirical		Symbolic/mythic
Consciousness		Unconsciousness

This emphasises the prospect of implementing discussions on impacts that may be expected from geographical education on social contexts, and the setting up of educational systems. As has been mentioned, these prospects are potentially wider and more demanding in post-modern society than in past social organisations. To react to these impulses and benefit from the prospects, the globalisation of geographical education will become cardinal. Globalisation is to be intended as the setting out of thorough discussion with the aim of sharing experiences, focusing on relevant conceptual and methodological backgrounds, and trying out lessons. This design is

antipodal to any efforts to use global networks and improved technical tools to stimulate and diffuse homogenous approaches to education. Globalisation may contribute to emphasise local cultural richness by circulating its assessment and thereby optimise the educational follow-up. Standardisation is to be operated in data collecting, monitoring systems and technical tools for communication. Standardising techniques for global discussions protecting local cultural heritage, including educational backgrounds, could be the main route to follow in dealing with tasks arising and future trends, renovating the role of education within the historical spirit of geography.

In this view, integrated research and educational efforts should be optimised to implement and disseminate the understanding of interaction between the ecosystems and human communities on the various scales—from the meso-regional to the local scales—, the assessment of spatial interaction between local systems and globalisation, and finally the spatial implications of social conditions. There is no doubt that, in this prospect, fieldwork may have a key role due to the need to create efficient synergy between the consideration of case studies and individual realities, on the one hand, and the design of general visions, on the other.

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