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Journal of Geography in Higher Education

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/cjgh20

Fieldwork in geography teaching: A critical review of the literature and approaches

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Published online: 02 May 2007.

To cite this article: Martin Kent , David D. Gilbertson & Chris O. Hunt (1997) Fieldwork in geography teaching: A critical review of the literature and approaches, Journal of Geography in Higher Education, 21:3, 313-332, DOI: 10.1080/03098269708725439

To link to this article: http://dx.doi.org/10.1080/03098269708725439

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Journal of Geography in Higher Education, Vol. 21, No. 3, 1997

Fieldwork in Geography Teaching: a critical review of the literature and approaches

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ABSTRACT *Virtually all lecturers in geography recognise the importance of fieldwork as a vital mode of teaching in the subject. This paper draws on material produced as part of a HEFCE review of teaching and learning in the field and assesses the implications of recent changes in higher education for field studies in geography. The literature on the development of, and recent changes in, fieldwork practice is reviewed and assumptions about appropriate forms of teaching and assessment are challenged. The need for carefully integrated preparation of project-orientated fieldwork is stressed and the importance of debriefing and feedback after field visits is emphasised. Various suggestions for guidelines on good practice are presented. Finally, a range of future issues and problems in fieldwork is identified and discussed.*

KEYWORDS Geography fieldwork, literature review, teaching, assessment, good practice.

Introduction

> Effective learning cannot be expected just because we take students into the field. (Lonergan & Andreson, 1988, p. 70)

Fieldwork is widely regarded as an essential part of undergraduate education in geography and lecturers generally agree that it represents one of the most effective and enjoyable forms of teaching and learning for both staff and students. Field studies provide the opportunity to experiment with a wide variety of different modes of course delivery and have a valuable role as a vehicle for the integration of many theoretical and practical concepts taught within a geography degree (Kern & Carpenter, 1984, 1986; Lonergan & Andreson, 1988; McQueen *et al.*, 1990; Gold *et al.*, 1991; Gold & Haigh, 1992; McEwen, 1996b). Field experience is also seen as vital for the development of students as qualified practitioners in all aspects of geography, since a great deal of

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research in the subject is fieldwork based (Gold, 1991). Despite the importance attributed to fieldwork, few departments require more than 24 days in the field during an undergraduate degree and the average British department of geography requires only 15 days (Higgitt, 1993).

The aim of this paper is to review the development and contemporary position of fieldwork in geography in British institutions of higher education, to highlight problems and issues for the future and to stimulate debate. The following discussion draws on material produced as part of a HEFCE (Higher Education Funding Council for England) review of teaching and learning in the field and the implications of recent changes in higher education for geography. More specifically, this paper aims to provide some guidelines on good practice (bullet-point paragraphs) through a comprehensive review of publications on fieldwork in geography and related disciplines. This review shows that comparatively little research has been carried out into the effectiveness of differing modes of fieldwork teaching and assessment, yet fieldwork is usually one of the largest items of recurrent expenditure within a geography department's budget.

The new Teaching Quality Assessment (TQA) systems administered in England, Scotland and Wales have also become an important driving force for change, requiring universities to examine critically their fieldwork programmes (Bull & Church, 1995; Higgitt, M., 1996). Changes to the paradigms and theoretical structures of the various subject areas within geography have led to new objectives in fieldwork for which earlier pedagogic methods are now considered unsuitable. New research methodologies and technologies have become available, which have partially invalidated some traditional types of field practice and necessitated the introduction of new ones. One example is the fall of the Davisian paradigm in geomorphology and the rise of process-based studies, where the old observation, surveying and sketching of landforms has been supplanted by hypothesis generation and testing, involving measurements of phenomena such as streamwater quantity and quality using a range of instrumentation and laboratory methods, followed by statistical analysis and interpretation.

Other examples related to new technology are the use of video cameras and camcorders to gather data on projects designed to assess people's 'sense of place', and the use of portable computers to record and provide instant analysis of project data while still in the field, enabling 'on-site' decisions to be made in terms of evaluation of sampling strategies or redesign of questionnaires after pilot testing.

There have also been enormous changes in the content and delivery of the school curriculum over the last 30 years and therefore the abilities and expectations of students have changed dramatically. A 'trickle-down' process has occurred to A-level syllabuses with fieldwork exercises previously used at degree level entering the school curriculum through geography graduates, who have become teachers, using or adapting exercises and approaches that they themselves experienced while on their original geography degree. This has driven further changes in fieldwork style and practice in higher education.

This review is based largely on material and literature relating to the United Kingdom, but the general principles described apply to fieldwork practice in many other parts of the world.

Definition of 'the Field' and the Changing Nature of Fieldwork

Lonergan & Andresen (1988) define 'the field' as any place "where supervised learning can take place via first-hand experience, outside the constraints of the four-walls

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classroom setting" (p. 64). The range of fieldwork delivery methods and styles varies considerably and the type and style of fieldwork within geography has changed rapidly since the 1950s.

In Figure 1 a general model summarising the major shifts of emphasis and approach in field teaching in geography over the period 1950–97 is presented. Obviously, patterns and the exact timing of the adoption and integration of the different approaches have varied from one institution to another. For example, some geography departments will claim always to have done project-based fieldwork since the 1950s. The early role and continuing significance of the Field Studies Council in this respect deserves mention (Barrett, 1987).

Gardiner (1996) has stressed the dynamic nature of approaches to fieldwork teaching and the need for both staff and students to adapt to change. The most significant developments within the past 15 years have been:

(a) the integration of skills with fieldwork within higher education following the *Enterprise in Higher Education* initiative of the mid/late-1980s (Bull & Church, 1995; Kneale, 1996; Livingstone, 1996; McEwen, 1996b);
(b) growth of cohort size combined with wider ability ranges of students (Gibbs & Jenkins, 1992; Hindle, 1993; Jenkins, 1994; Clark, 1996; Gardiner, 1996; Higgitt, M., 1996);
(c) increasing budgetary constraints leading to the transfer of fieldwork costs from the institution to individual students and/or their parents (Gray, 1993).

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Types of Fieldwork Activity

As Figure 1 shows, in practice, there is a continuum of types of activity available in the field, characterised by different forms and levels of student and staff involvement. From the student viewpoint, all field activities can be placed somewhere on two continua: first, between observation and participation; second, between dependency and autonomy (Figure 2). Many field courses involve several different combinations of activities.

Observational Fieldwork

Observational fieldwork is an important way of passing on staff experience and ideas, and is comparatively easy to organise. The principal problem with observational fieldwork is that students are only required to 'be there' with the result that their attention may actually be elsewhere, especially if the experience is protracted.

- The simplest and most traditional form of observational fieldwork is the 'Cook's Tour' or 'look-see' field visit. Students often describe this type of activity as boring, since they are not deeply engaged in the fieldwork process (Brown, 1969), but it can be useful at the start of a field course, to give a first overview of an unfamiliar landscape. Couch (1985) argues that carefully directed observation can be a useful learning method, especially if reinforced by on-site tutorial-style discussion.
- Students become more engaged, typically, if the tour is on foot and they have the opportunity to converse with staff, rather than being lectured at (Gold, 1991). This format allows students to make some observations independently and to follow up in an informal way, issues they find interesting with staff.
- Unfortunately, during observational fieldwork, if unprompted, students often miss key features, and if prompted, have a tendency to reproduce the staff viewpoint

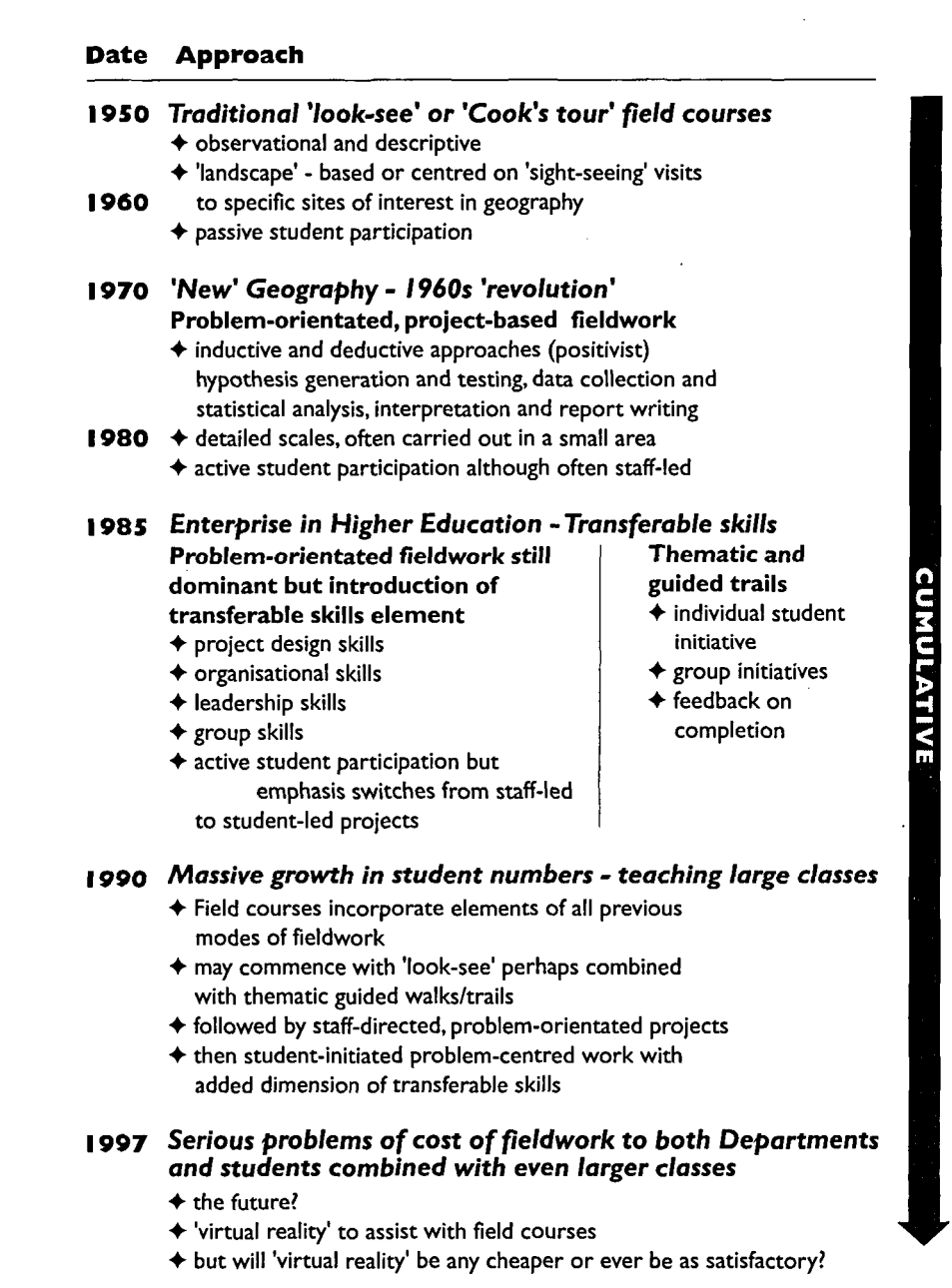


FIGURE 1. Changing approaches to fieldwork in geography 1950–97.

uncritically (HMI, 1992; Haigh & Gold, 1993). Engagement can be encouraged by informing students before the start of the fieldwork that they will be required to submit an assessment describing phenomena that they themselves, rather than the staff, have seen.

- The art of field note taking on observational fieldwork always has and continues to cause problems for many students. Lewis and Mills (1995) provide a useful set of

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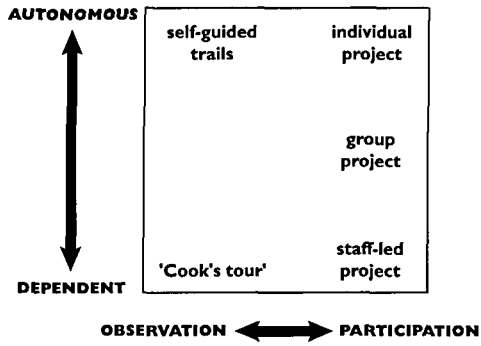


FIGURE 2. The continua of autonomy and participation in fieldwork.

guidelines, particularly with respect to field sketches and the need to annotate them clearly.

- An increasingly popular option is a tour or site visit with worksheet (Pedersen, 1978; Keene, 1982, 1993; Habeshaw *et al.*, 1992; Slater, 1993) or map (Brown, 1969), with questions to answer from student observation. Self-guided excursions, town and countryside trails are a more autonomous and sophisticated version of this type of exercise (Keene, 1987a, 1989). Many new trails have a sequence of activities to challenge and involve the student (NCC, 1981; Duff *et al.*, 1985; Keene, 1987b, 1989; Sims, 1988; Higgitt & Higgitt, 1993a, 1993b, 1993c; Higgitt, D.L., 1996).
- Self-paced guides to field practice such as Keene (1982) provide a similar approach to learning that can be easily applied to a wide variety of localities.

Participatory Fieldwork

Participatory fieldwork has the reputation for engaging student attention and deepening the learning experience. However, this is not always true. There is a continuum between staff-led and autonomous work (Figure 2) and it is probable that this also reflects a continuum of engagement on the part of the student, with students who undertake solo project work usually being more committed than those participating in staff-led projects (Tinsley, 1996). The drawbacks to participatory work are threefold: first, that extensive preparation is often necessary to ensure a satisfactory outcome; second, that project work is more time-consuming than the 'Cook's tour' format; and third, that it can be difficult to supervise adequately (for health and safety reasons, if not academic reasons) scattered groups, or worse, individual autonomously operating students (Boud & Feletti, 1991).

- Students are most dependent in staff-led project work. In a typical staff-led project (Cloke *et al.*, 1981), the staff member decides on a project design and allocates activities to the student participants. The methodology and mode of analysis will usually be closely controlled. This can be a useful introduction to participatory fieldwork, and is a fairly common format in the first year. The format is also typical for a field day to support a laboratory-based course, where students take samples in the field which will then be analysed later during practical/laboratory work (Mellor, 1991).
- Sometimes this format enables students to participate in staff research projects. Where students can be given autonomy within a self-contained part of such a

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project this can be a worthwhile learning experience (McQueen *et al.*, 1990; Purdom *et al.*, 1990), but staff should examine their motives carefully before using student fieldwork to further their research aims. Students should not be exploited and their role should always be acknowledged by the lecturer(s).

- Intermediate between a staff-led project and independent group project work and especially common in the second year of geography and geology degrees (though of increasing importance in the first year) is the staff-guided group project. Here staff help groups of students to formulate a project and offer help with choosing a field area and the selection and application of appropriate methodology (Couch, 1985; Slater, 1993).
- Role-playing project work is an important variant of this approach. Competition between groups may be a useful spur to achievement and may foster enterprise skills (McEwen, 1996b). There can be high educational value in coming to terms with the diversity of viewpoints arrived at by participants in a well-structured role-playing exercise (Harrison & Luithlen, 1983; Gold, 1991; Gold *et al.*, 1993; Slater, 1993).
- In student-led group work, the student group will usually formulate the research design and choose the methodology (Darby & Burkle, 1975). The role of staff is to encourage and to advise on health and safety.

Learner-practitioner and Participant Observation

In human geography and the social sciences, particularly sociology and anthropology, participant observation is an alternative fieldwork format. This can also have its place in physical geography. In human geography, individual students join social groups and participate in their lifestyle. In physical geography, students can, for example, take on the role of environmental manager or consultant, where it becomes known as learner-practitioner activity.

- A variant of participant observation and learner practitioner activity—work placement—is becoming increasingly common. Students are placed with organisations—commercial companies, charities, government, local and national environmental agencies and planning departments—and work as an employee of the organisation for a period of as little as one week up to a whole year. This can be seen as a new and important format for fieldwork in geography. Most students return from work placements as more mature and responsible individuals. However, certain ethical issues may arise: it is vital that the students are properly supervised and that they are not exploited as cheap labour.
- Cooperative departmental research projects involving both students and staff working together in teams to solve active research problems are another development in this area and provide an analogue for the apprenticeship situation. McEwen (1996a) provides a good example.

Student Response to Different Teaching and Learning Methods

Evaluation of the different approaches to student learning in the field described above is usually only based on anecdotal evidence and experience. There is a serious lack of systematic empirical evaluation of the effectiveness of fieldwork as a learning strategy—an alarming observation considering the substantial quantities of resources involved.

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- Many authors have commented that students respond well to fieldwork, especially fieldwork based on 'active learning' and project-based strategies. Amongst others, Keene (1982), Andresen (1984), Crothers (1987), Markovics (1990) and McQueen *et al.* (1990) commented that students preferred problem-based fieldwork to 'Cook's Tours'.
- A deeper student understanding of concepts has been claimed for process-based fieldwork by Wiley and Humphreys (1985) and Wheater (1989). Wiley and Humphreys (1985) and Kern and Carpenter (1986) claim that abstract topics and higher-level concepts are easier to teach in the field than in class. McElroy (1981) and Haigh (1986) explain this by stating that fieldwork enables students to connect theory with real experience. Hoffmann and Fetter (1975) did not, however, find appreciable differences in learning between fieldwork and classwork, but found that field-educated students were generally more motivated.
- Particular benefit to students has been seen in undertaking fieldwork of all types in areas local to their university or college, since such work enables them to identify with the area and is relevant to their everyday experience (Babcock, 1973; Laws, 1981; Rawlings, 1981; Garver, 1992; Hindle, 1993; Slater, 1993). Urban and intensive agricultural ecosystems are more relevant, and more available to most students than distant semi-natural habitat (Moles, 1977; Hale, 1986, 1993; Wheater, 1989; Dove, 1993; Openshaw & Whittle, 1993; Slater, 1993). Such fieldwork may also be more relevant to students' future careers. Locally based short excursions also have advantages of economy and do not disrupt timetables or eat into vacations (Laws, 1981).
- Fieldwork is seen as a good preparation for the workplace (Fryer, 1991; Garver, 1992; Slater, 1993). It is widely accepted that skills can only be taught and learned effectively by student participation in that activity (Crothers, 1987).

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Objectives of Fieldwork

The objectives of any fieldwork exercise need to be clearly identified, since they condition the type of fieldwork and its success as an educational exercise. Table I summarises the objectives of fieldwork as expressed in the literature (Adderley, 1975; Tranter, 1986; Lonergan & Andresen, 1988; Gold, 1991; Jenkins, 1994).

Additionally, the design of a fieldwork programme in geography must be integrated into the structure and learning objectives of the complete degree that it supports. Bearing in mind the numerous possible objectives listed in Table I, the following key factors must be considered in the planning of an individual field course:

- Fieldwork should be compatible with the educational experience and state of progress of the students. The knowledge and academic and practical abilities of the students should be sufficiently advanced that the work envisaged will be challenging, but not so advanced that it will lead to boredom and disaffection.
- Field teaching and learning methods should complement the teaching methods, content and ethos of the rest of the course.
- Teaching and learning methods should ensure the safe, effective and sustainable use of the terrain and socioeconomic circumstances in which the fieldwork will operate.
- Planning of a field visit must include consideration of problems of access to land or to institutions that may be willing to supply relevant information. Liaison with

TABLE I. The various objectives of fieldwork grouped under the three general categories identified at the Higher Education Study Group Meeting, 1994.

(1) *Subject-specific objectives:*
- teaching of specialist field techniques and research methods;
- use of experimental data to solve specific problems and thus illuminate areas of theory and practice;
- the integration of the subject, from theory to practice;
- fostering awareness of other places and cultures ('spirit of place');
- exposing students to a variety of approaches to the discipline;
- providing a basis for independent research by students;
- exposure of students to 'real' research;
- provision of 'real' material and context for a laboratory-based practical course ('live' problems);
- enhancement of analytical and interpretive skills;
- training students in observation, measurement and recording;
- teaching students to use experimental design;
- learning to 'filter' observations and discriminate valuable data from 'noise';
- development of interpretive abilities from both landscape observation and results of problem-orientated fieldwork.

(2) *Transferable/enterprise skills:*
- to provoke students to ask questions and identify problems;
- stimulation of independent thinking;
- development of the motivation and skills to learn autonomously;
- the enhancement of communication and presentation skills;
- development of group-work skills;
- development of leadership skills;
- the improvement of organisational skills such as time/human resource management;
- appreciation of the importance of safety in fieldwork;
- realisation of the parallels between skills involved in carrying out fieldwork and those in employment in the 'real' world.

(3) *Socialisation and personal development (the 'hidden agenda' of fieldwork):*
- stimulation and enhancement of enthusiasm for study;
- development of a respect for the environment;
- encouraging and developing social integration of the student cohort;
- enhancement of staff–student relations;
- getting to know colleagues;
- helping to market the course;
- becoming involved in staff research.

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local experts is often particularly important and the manner in which this is done may affect the whole success or failure of the field course.
- Fieldwork should be efficient and viable within time and budgetary constraints.

Structure of the Field Learning Experience: preparation, practice and debriefing

A series of 'learning stages' (Henderson, 1969; Laws, 1981; Boud *et al.*, 1985; Couch, 1985; Lonergan & Andresen, 1988) can be identified within all practical activities, including fieldwork. These are: preparation and briefing, engagement in the activity, processing of the results of the activity, interpretation and presentation of results, debriefing and feedback.

Preparation and Briefing

Preparation is critical for efficient fieldwork. Staff should ensure that students have been adequately prepared for fieldwork and have the conceptual tools and knowledge to be

able to carry out the proposed activity (Laws, 1981; Barass *et al.*, 1985; Couch, 1985). Field time is too rare and expensive to waste on lectures and other preparation which could have been given before coming into the field (Garver, 1992; Gold & Haigh, 1992).

- During preparation for fieldwork, students should explore what will be required of them in the field and acquire the knowledge and skills to enable them to carry out their tasks in an efficient way.
- Briefing should deal not only with the logistical aspects—transport, dress, equipment, food and safety—but also with the academic context, aims and objectives of the fieldwork. Successful briefing provides a structure for learning and sets limits within which activities—including learning—will happen (Laws, 1981; Lonergan & Andresen, 1988). The student should be sensitised to the environment in which the fieldwork will take place. The briefing process inevitably conditions the students' perception of the field environment and care must be taken to avoid the perpetuation of prejudices and stereotypes.
- Active preparation by students—literature research on the field area, perhaps combined with Internet/World Wide Web searches, before the start of the field excursion—can be more effective than briefing by staff, although some students may require monitoring to check that they have adequately prepared themselves. The preparation by student groups of their own field manual for the area they will visit can lead to high levels of engagement by the students concerned (Bradbeer, 1996).
- Briefing is an important part of the process of working in the field with students. In the field, students may need briefing before the commencement of each activity, particularly in unfamiliar and challenging environments where multiple activities are planned.
- Adequate preparation by staff is critical for successful fieldwork. Academically, this includes literature search, analysis of cartographic and remotely sensed information, Internet/World Wide Web searches, physical reconnaissance of the field site and assessment of its suitability, safety and durability for the proposed exercise. Logistically, there needs to be arrangement of travel and accommodation and briefing of bus drivers, hostel wardens, hoteliers and guides for the requirements of the field course.
- A formal and documented risk assessment is of critical importance. Times of tides and nightfall and the weather forecast should be ascertained. The locations of emergency routes, refuges and public telephones, the phone numbers of emergency services such as coastguards and mountain rescue teams should be established, as appropriate. A route and estimated time of return, and clear instructions on the procedure to be followed in the event of non-return, should be left with a responsible person.

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Field Learning and Teaching: engagement in the activity, processing the results and interpretation

The format of the fieldwork and the type of teaching and learning strategy followed in the field will have been decided in the planning stage. The format to some extent controls the type of teaching and learning strategy to be followed and both will depend on the objectives of fieldwork and the resources available. The overriding objective should always be the maximisation of the students' engagement and educational benefit from the work.

The following points should be considered in deciding the most suitable teaching and learning strategy:

- Deep knowledge of a locality seems to be most effectively and easily acquired through multi-sensory experience and participation in activity. Often, the holistic appreciation of a setting is retained more vividly than the constituent parts (Crothers, 1987). Discovery can lead first to induction and to the construction of knowledge by the students and thence to deduction and the adoption of hypothesis generation and testing (Kent & Coker, 1992). A high degree of student autonomy and plenty of time is required for this type of approach, since experiential learning can be very time-consuming to acquire (Lonergan & Andresen, 1988).
- Conversely, the sheer diversity of experience available in most field localities means that if a very specific learning outcome is desired, some aspects of the field experience must be carefully controlled (Keene, 1982; Lonergan & Andresen, 1988; Gold *et al.*, 1993), for instance by stating explicit objectives or distributing work-sheets or other guidance before starting the exercise.
- Supporting materials (handouts, trail guides, field guides, maps) have a powerful influence on the success of fieldwork and need careful design, to provide the necessary concepts but not to 'spoon-feed', and to challenge students while giving them the confidence that they can accomplish the set task (Keene, 1982).
- Problem-based fieldwork, as with any problem-based learning (Boud & Feletti, 1991), can provide a very effective vehicle for learning (Eberhardt & Thomas, 1991). Here, students construct a solution to a theoretical or practical problem by acquiring and analysing field data. A survey by Andresen (1984) and the experience of the Field Studies Council (Crothers, 1987; Rainbow, 1987) indicate that this approach is highly valued by staff and students, but Gardiner and Unwin (1986) and HMI (1989, 1992, 1993) have demonstrated that poor preparation can (and often does) limit its effectiveness.
- Understanding can be deepened by encouraging students to address process-based questions, rather than descriptive ones (Wiley & Humphreys, 1985).
- Skills can really be acquired only through direct participation and taking responsibility for their own work (Crothers, 1987; Lonergan & Andresen, 1988).
- Contact with experienced practitioners—an apprentice-like situation or question and challenge—on active research sites can provide students with insights into the research process (Garver, 1992). A high level of motivation and achievement is normally visible in students working alongside professionals on real research problems (McQueen *et al.*, 1990).

Debriefing

Debriefing of students is a critical but often neglected part of student fieldwork (Pearson & Smith, 1985). This is because fieldwork is often so complex and time-limited that there is insufficient time for students to relate theoretical concepts to what they actually experience (Lonergan & Andresen, 1988).

- Debriefing should encourage a thorough review and integration of the theoretical background and the student experience in the field and should prepare the student for the next stage in the educational processes.
- Debriefing should follow the learning experience as soon as practicable, since recall fades and memories can become confused by later events. Students should be

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encouraged to recall and share experiences, since it is a rare field visit where each student saw everything of importance. Staff can usefully highlight things that were noted by students but not regarded as critical, and things remembered by students but not recorded in their field notes can be written down.

- Short cycles of preparation–activity–debriefing can occur within the longer term cycle of a field course and can be very effective (Pearson & Smith, 1985; Lonergan & Andreson, 1988), although following each activity with a debriefing session can be time-consuming and disrupt the 'flow' of experience. On visits lasting several days, evening debriefing sessions after a day's activity in the field are often seen as a good compromise.
- Some institutions use short reports or group work exercises and presentations 'working up' aspects of the day's fieldwork to formalise debriefing. Such exercises may also form the basis of assessment. Others use these sessions as a way to refine and annotate field notes, plans, etc.
- The availability of literature during preparation and debriefing at the field base is also seen as of considerable importance, since it enables students to make comparisons and place their observations in a wider context.
- Soon after the fieldwork is finished, a final debriefing session should occur, with discussion and processing of data and the relating of the objectives of the fieldwork to the experiences of the participants. The total fieldwork experience should also be explicitly integrated within the learning objectives of the degree course as a whole by the staff leading the fieldwork. All too often this vital step is omitted by the fieldwork team.

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Feedback

Feedback is a critical, but often neglected component of the fieldwork learning experience (Gibbs *et al.*, 1988).

- Ideally, feedback should be two-way, with students informing staff of the strengths and deficiencies of the learning experience, and staff helping students to improve the quality of their work by both indicating where things have been done well and admitting to shortcomings. Formal questionnaires and 'tick-sheets' can be a useful way of passing feedback information between students and staff.
- Feedback should consolidate the learning experience and prepare students for progression to the next stage of the course. Feedback is also a very important way of integrating the field experience into the course structure as a whole. The use of examples from the fieldwork programme in subsequent lectures and tutorials is a typical integrative strategy.

Assessment of Fieldwork

The assessment method chosen should always complement the teaching and learning strategy and be considered at the initial planning phase. Assessment can be summative, formative, or both. Summative assessments essentially grade students but do not provide much feedback for the student to be able to learn from mistakes. Formative assessment can play an important part in the debriefing process, since strengths and shortcomings can be analysed and the student can learn from the experience.

- A number of departments use a pro-forma feedback sheet to remove some of the labour from the assessment process while still providing worthwhile feedback.
- Most students take formal assessments more seriously than informal staff comment.
- Most assessment of fieldwork takes the form of a report that should be well structured and effectively written, illustrated and presented. Aims should be clearly stated, background literature briefly reviewed, methods described and results analysed and presented. The most difficult part of a fieldwork report for many students is the interpretation of their own results (Haigh & Gold, 1993). This should always be derived from their own observations or data in combination with background reading and material. Unfortunately, it is commonplace for students to present basic results or observations but then be unable to interpret them adequately or to simply present a reworking of background material as a substitute for a fully integrated interpretation of their own data.
- Fieldwork offers many other opportunities for alternative modes of assessment and for linking of actual fieldwork practice to a wider range of skills (Lonergan & Andresen, 1988; Kneale, 1996; McEwen & Harris, 1996). Oral presentation of results in a preliminary seminar, while still on the field course, is often effective and helps students to organise their work for a later, more detailed, written report. A proportion of the final assessment marks may be given for the oral presentation (McEwen & Harris, 1996).
- Formative peer-assessment can be a very potent way of encouraging students to think critically about their work; it is often easier to identify the strengths and weaknesses of others than to identify your own (Gibbs *et al.*, 1988; Gold & Haigh, 1992). Peer assessment can be anonymous, to guarantee that personality is excluded from the process. In a refinement of this process, there is a preliminary formative anonymous peer-review of reports, followed by the opportunity for students to redraft before a final summative assessment by staff (Feldman & Schloman, 1990). The peer-review comments can themselves be assessed, if desired.
- Organisational, group and leadership skills may also be assessed as part of fieldwork (Kneale, 1996). Often this is best achieved by some form of peer assessment of individual participation and contribution to group work (Wheater & Dunleavy, 1995).
- Assessment of group activity on fieldwork is always controversial (Habeshaw *et al.*, 1992). It is often best to ask students to produce individual reports or oral presentations. Where marks count towards a student's personal degree profile, sharing of marks virtually always leads to resentment on the part of those who have done the bulk of the work at those who may have taken life more easily! However, writing of combined group reports is a useful preparation for the world of work.
- Fieldwork provides one of the best opportunities for students to demonstrate high standards of presentational skills. Quality of presentation should usually be assessed as part of the final fieldwork mark.

Future Issues and Problems in Geographical Fieldwork

The following section summarises the key issues facing fieldwork in geography in the late 1990s. Where appropriate, the needs for research into both the practice and assessment of fieldwork are identified and, most critically, the importance of evaluation of its educational effectiveness is highlighted. Thus the points below are not commented

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on in detail but rather should be seen as pointing the way forward in terms of the future issues that face those organising and running geographical field courses.

Evaluation of the Various Different Modes of Field Teaching and their Effectiveness

In designing a fieldwork programme, attention must be paid to the ways in which students learn and the strategies that enable them to learn most effectively. The concepts of 'deep' and 'shallow' learning (Perry, 1970; Adderley, 1975; Hounsell, 1984; Ramsden, 1988; Gibbs, 1992; Gibbs & Jenkins, 1992; Higgitt, M., 1996) are relevant here. Fieldwork should engage and motivate students.

Many lecturers would argue that, in fieldwork, this can be done best by making the teaching 'student centred', with the lecturer's role being that of a facilitator rather than supplying facts for students to reproduce at some later date (Gibbs *et al.*, 1988; Gold, 1991; Gibbs, 1992). Thus some academics would see project-based fieldwork as 'deep', while observational activity is seen as 'shallow' and not engaging the attention and enthusiasm of the student as fully. However, there is, as yet, little objective empirical evidence supporting the assertions that 'student-centred' learning is markedly more successful as a field educational strategy. Research is required to test this belief, particularly bearing in mind the high costs of a great deal of project-based, student-centred learning.

The Need for and Value of Progression in Fieldwork Teaching

Fieldwork skills and the skills needed by students to make effective use of the student-centred learning strategy are learned over a period, not adsorbed instantaneously the moment that students step out of the minibus or coach. Some students may be unhappy with, or indeed be unable to cope with, an abrupt transition from being taught in the classic lecture format to being taught through student-centred learning techniques (Laws, 1981; Slater, 1993). Some students now spend their whole fieldwork programme on project-based, problem-orientated fieldwork but this does not necessarily give them the best geographical education. Students need a context within which to work and the ideas of progression in modes of fieldwork teaching, as demonstrated in Figure 1, are important.

In practice, it is clear that many departments recognise the development of students by operating a strategy of increasing student autonomy and the proportion of student-centred learning through the fieldwork programme on the degree as a whole, as well as through each field course. Thus in the first year/stage 1, fieldwork is often predominantly of the 'look-see' or 'Cook's Tour' variety, with a small component of staff-directed exercises. In the second year/stage 2, student-centred but staff-directed exercises are often an important element of fieldwork, while in the final year/stage 3, individual or group project work is dominant, with greatly reduced supervision by staff (Figure 1).

Problems of Maintaining Existing Modes of Fieldwork Teaching

Until the 1990s, fieldwork was often a relatively 'intimate' experience that provided an unparalleled opportunity for small-group teaching to the benefit of both students and lecturers. A major problem of recent years has been the wish of lecturers to maintain this intimacy when presented with larger and larger groups of students (Clark, 1996; Livingstone, 1996). Various suggestions have been made to try to address the problem

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of large-group teaching in fieldwork (Gibbs & Jenkins, 1992; Gold & Haigh, 1992; Rodaway & Slowe, 1993; Jenkins, 1994; Clark, 1996; Gardiner, 1996). However, none of these is entirely satisfactory. Jenkins (1994) lists 13 ways of carrying out large-group field courses more effectively but almost all involve trade-offs in both the staff and the student experience.

Observational fieldwork means talking to greatly increased group sizes, coupled with the physical problems of getting them on and off coaches, both of which have negative effects on the attention and concentration of students. For this reason, the self-guided trail or worksheet has become more popular. Project-based fieldwork becomes more difficult, not just because of the need to supervise more and larger groups but because of associated resourcing problems such as lack of equipment or the requirement to switch from use of minibuses to coaches. The need for multiple items of more expensive field equipment, given the reductions in capital and consumables budgets, is a particular difficulty, especially if the equipment is only used within field course for a few weeks (or even days) of the year (Clark, 1996).

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Problems of Fieldwork Financing and the Question of 'Value for Money' in Fieldwork Teaching

In the 1990s, students are being asked to pay an increasing proportion of fieldwork costs usually on top of dwindling grant support and inevitable existing debt in the form of student loans and bank overdrafts (McEwen, 1996b). Some departments now offer several courses with different levels of student contributions, so that those who have little spare money can at least obtain some form of field experience, while those who are 'well-heeled' can go to ever more exotic locations. While this form of 'choice' is manifestly unfair, it does provide some answers in terms of fieldwork planning under financial constraints.

A related aspect is that, because students pay more than ever for their fieldwork experience, their perception of 'value for money' becomes increasingly important. A cheaper field course within the British Isles may not be as attractive as a more expensive one to the Mediterranean, in terms of its perception as 'value for money'. Unfortunately, in assessing 'value for money', the quality of the night life may also be judged as equally or even more important than the geographical location. When planning field courses, lecturers may have to give more attention to the 'associated social benefits' in the future! This whole area of the 'total experience' of the field course in relation to 'value for money' also requires some research.

Gender Issues in Fieldwork Planning and Operation

Maguire (1997) has raised the issue of gender in relation to the nature of the fieldwork experience, particularly in the harsher environments favoured by many physical geography courses. In a survey of 100 first-year students taking compulsory fieldwork in either North Wales or the European Alps, she found that significantly more women than men believed that fieldwork demanded high levels of fitness. She found that 84% of women, compared with 68% of men, believed that students had to be very fit to do physical geography. In comparison, while 55% of women thought that fitness was also vital for human geography, this view was only shared by 36% of men. Men believed themselves to be fit, while women predominantly took the view that they were unfit and this was

reflected in their enjoyment of the subjects, with a greater proportion of men ranking physical geography highly.

Geography is a very popular subject among women, yet because of the male bias in the lecturing profession, a majority of field trips are organised by men. The need to pay more attention to the needs and sensitivities of women students attending field courses is another important issue for the future.

Conflict between Specialised 'Option-based' Fieldwork and Role of Fieldwork in Integration within Geography as a Whole

Given the limited nature of fieldwork resources in most departments, there is a requirement to run fieldwork as efficiently as possible. One potential conflict here is the extent to which field courses should specialise within the overall subject of geography. Residential fieldwork for second (stage 2) and final year (stage 3) option courses is less likely in the present age of scarce resources and high student numbers. One of the attractions of the subject of geography is that it is broad in scope but that it also allows specialisation in a wide range of sub-areas.

In fieldwork, tensions always have existed between the need to educate geographers in geographical synthesis and in the landscape, as opposed to allowing lecturers and students to follow very detailed interests in their own part of the subject (Brown, 1969; Cloke *et al.*, 1981; Haigh, 1986). These tensions are arguably now stronger than before because economies of scale are greatest if entire year groups are taken away together, rather than allowing a large number of specialised field courses to be developed. As a partial answer to this problem, many residential courses now ensure that students first obtain an overall geographical appreciation of the area they are visiting and then allow them to choose specialised project-based work in the sub-areas of their greatest interest. However, research is needed into the extent of this problem which is clearly also linked to the balance of different modes of fieldwork teaching.

Links between Project-based Fieldwork and Main Project or Dissertation

Fieldwork is very often a prelude to and preparation for the main project or dissertation that most undergraduate geography students are required to undertake in their final year (Hindle, 1993; Parsons & Knight, 1995; Burkill & Burley, 1996; Tinsley, 1996). A majority of geography projects involve fieldwork of some kind and it could be argued that the quality and quantity of the preceding fieldwork experience is very often closely related to the quality of the resulting individual project work (Kneale, 1996; Tinsley, 1996). Project-based, student-centred fieldwork arguably provides the best and most relevant experience for geographers.

However, these ideas require testing and research. For the majority of students, how close is the link between previous fieldwork experience and the nature and quality of their dissertation in geography? In reality, what proportion of student projects benefit directly from the previous fieldwork experience and are there ways in which this can be improved?

Relative Effectiveness of Different Forms of Fieldwork Assessment

Numerous forms of assessment are possible for fieldwork (Gibbs *et al.*, 1988; Jenkins,

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1994). There is a need for a more thorough evaluation of the effectiveness of the whole range of types of assessment and of varying combinations of different modes of assessment. Transferable skills are now, without question, a valuable additional component of the fieldwork experience (McEwen & Harris, 1996) but to what extent should their assessment be separate or additional to testing of a student's geographical ability?

Fieldwork is particularly valuable in its potential for group work and the development of leadership and organisational skills (Wheater & Dunleavy, 1995; Kneale, 1996). However, the evaluation of group work is one of the most difficult areas of assessment and satisfactory answers to this problem have yet to be found (Rodaway & Slowe, 1993; Wheater & Dunleavy, 1995). An increasing amount of research has been completed on the nature and effectiveness of differing modes of assessment on the rest of geography degree courses but fieldwork has been comparatively neglected, yet provides one of the best opportunities for experimentation with different modes of assessment (Lonergan & Andresen, 1988; Higgitt, D.L., 1996; Kneale, 1996; McEwen & Harris, 1996).

Potential of Virtual Reality Fieldwork

Several projects are now under way to investigate the possibilities of using computer technology to create a 'virtual reality' field course. Given the ever increasing cost of fieldwork in an age of diminishing per capita educational resources, the technological fix has distinct attractions as an alternative and an answer to leaving the relative comfort of the lecture theatre and laboratory. This idea may almost certainly have its place in the curriculum of the 21st century, but is most likely to represent an additional source of information to supplement a field visit or to assist with field course preparation.

Conclusion

Fieldwork is vital to geography teaching, yet the problems and difficulties of organising and running an effective field course are increasing at the present time (Clark, 1996; Gardiner, 1996; McEwen 1996b). This paper has reviewed the existing position, summarised most of the relevant literature on the subject and provided some pointers for good practice. Although research into teaching and assessment methods in geography and their effectiveness has increased greatly over the past 10 years, many questions remain, particularly in relation to fieldwork. Various assumptions are widely made about the best ways to carry out and assess fieldwork but little objective research has been completed on their relative value and success. The demands for maximum efficiency and value for money from this most important component of geography teaching are guaranteed to increase. More objective evidence is inevitably going to be required to justify the continuation of fieldwork by all university geography departments and its place at the centre of virtually all geography degrees.

Acknowledgements

The authors wish to thank HEFCE for the funding upon which some of this work was based. Dr Brian Chalkley of the Department of Geographical Sciences at the University of Plymouth and several anonymous referees kindly commented very constructively on an earlier draft of this paper. Grateful thanks are also expressed to Brian Rogers and Tim Absalom of the Cartographic Unit at the University of Plymouth who drew the figures.

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