

Those who can do - those who can't don't: doing ethnography to impact on student experiences of digital geographies

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Abstract

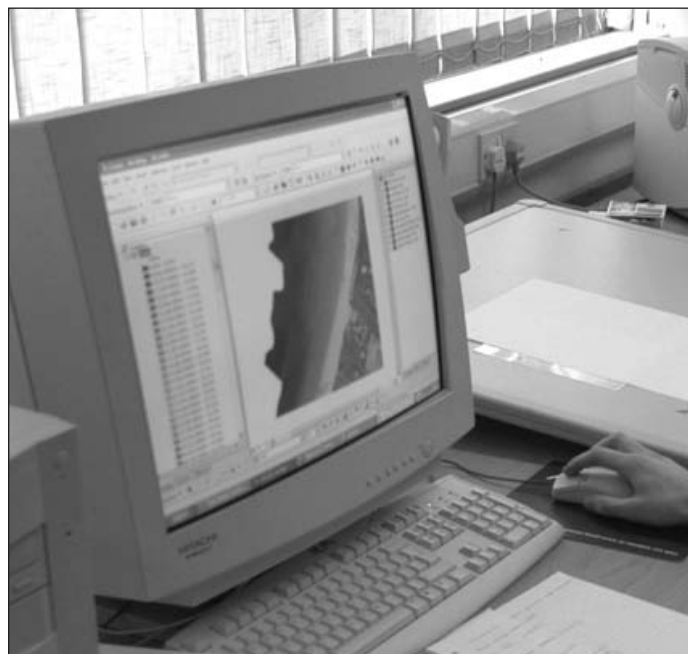
Digital geographies is a term that encompasses GIS (Geographical Information Systems) as well as other forms of geospatial software. These are acknowledged to be a difficult subject area for undergraduate students to master. Students tend to feel intimidated by using them and describe digital geographies, in module evaluations, as 'very hard' techniques to understand and learn, although they acknowledge their current and future importance both to the geospatial disciplines and to graduate job prospects.

The diffusion of digital geographies is set to accelerate and teachers need to develop pedagogic strategies to reduce student anxiety and promote effective learning. This paper explores a distinct avenue of a GIS module evaluation. In particular, it looks at how ethnography was used to examine the perceived difficulties of GIS with Level 1 geography students at Edge Hill University. The research has established a way forward for improving students' understanding and skill mastery of GIS in future modules. Moreover, it demonstrates how a government-funded initiative was used to forge a collaboration between the geoscientist delivering the GIS module and an ethnographic researcher who promoted the technique as a way of improving student engagement with digital geographies.

Overview

All undergraduate students studying for a BA or BSc Honours degree in geography at Edge Hill University take modules in Digital Geographies. Level 1 students follow a selection of Digital Geographies as part of a broader research techniques module. 'Digital Geography' is a Level 2 compulsory core module and there is also an optional Level 3 module entitled 'Advanced Digital Geographies' that about 25% of the cohort follow. A preconception exists, and subsequent module evaluations show, that students consider Digital Geographies to be difficult modules.

In order to address their concerns, we commissioned a research project to explore the reasons for the difficulties in the student learning experiences of digital geographies. We used an ethnographic technique to collect the data. The project status is that of research in progress and it is anticipated that it will be an 18-month project (Sept 2005 – Mar 2007). Apart from detailing the reasons why students found the modules difficult, it also outlines how the process of ethnographic research unfamiliar to scientists (GL), and conducted by a novice (GL), was used to forge a pedagogic way forward. The findings have been used to remodel the delivery of the Level 2 compulsory Digital Geography module presented in September 2006. A detailed ethnographic survey of the student experience will be completed following this, and will form the basis for a final report. The research is supported by the research group SOLSTICE (Supported Online Learning for Students using Technology for Information and Communication in their Education) which is part of a British government-funded CETL (Centre of Excellence in Teaching and Learning) at Edge Hill University. It also demonstrates the value of collaboration, which brought together a geoscientist and an ethnographer in their roles as Solstice Fellows.



The nature of digital geography

Digital Geographies (often referred to as GIS in the past) is a relatively recent term developed to describe a set of often complex geospatial, domain specific, information technologies used not only by geo specialists but increasingly by many other disciplines ranging from archaeology to zoology. It encompasses many information technologies, including the advanced use of spreadsheets and relational databases, remote-sensing and digital image processing, geographical information systems and the writing of scripts in computer processing languages such Visual Basic. Its history can be traced from at least the 1960s but it has only been in the last decade that hardware, software and data sources have evolved to cope with the complexity required, coupled to a cost which is acceptable to a wide variety of potential users. The use of digital geographies is a core to many (international) geo courses as well as being an undergraduate and postgraduate degree course subject in its own right (Sui, 1995; Reeve, 2000; Wikle and Finchum, 2003). Clearly, there is a need to ensure that students engage with the content successfully, not just for their own benefit but also for the successful and ongoing development of the discipline.

Digital geography and student perception

Casual and more formal (module evaluation) enquiries with geo students prior to this research project indicated a somewhat dichotomous appreciation of digital geographies. Although they acknowledge their worth to both the pursuit of the subject and their future career options, they complain (*sic*) of its difficulty to grasp, the demand for a lot of laboratory practice to learn the software routines, and the misconceived perception that it is more relevant to the scientific enquiry carried out by physical geographers and geoscientists. Although some commented on its apparent relevance to the complete range of geography modules; this is a further issue raised by other authors who lament that,

despite its modern-day core position, many other geo subdisciplines have been indolent in integrating GIS. (Lloyd, 2001; Hall and Scott-Walker, 2005). Occasionally, somewhat limp comments for the first decade of the twenty-first century surfaced such as “I am no good with computers” or “I don’t like computers.”

What is ethnography?

Ethnography is one kind of qualitative research in which the researcher aims to understand the views of participants, for instance student experiences, while asking broad, general questions and collecting text-based data in a naturalistic setting, such as the student classroom. Aiming at description, analysis and interpretation while trying to make sense of the larger meanings of findings, ethnographers typically conduct their inquiries in a subjective manner (see also Creswell, 2005).

The ethnographic approach uses inductive (bottom-up), interactive (immersive) and recursive (cyclic) analytic strategies, while drawing on various data collection methods. These include, notably, participant-observation and interviewing, but also descriptions of the group within its setting, and exploration of themes or issues that develop over time as the group’s participants interact with each other. Research questions thereby continuously emerge and change, and are actively shaped by participants’ responses and the critical self-reflexive stance of the ethnographer.

As a result, the ethnographic approach provides a detailed picture of a cultural group’s shared patterns of behaviour, concepts and beliefs, and sheds light on the ways in which people construct and make meaning of their world(s) (LeCompte and Schensul, 1999). In this particular situation, ethnography has been deemed particularly suitable to gain an understanding of student experiences of GIS, as it enabled the tutor (GL) to explore students’ perspectives and experiences – without preconceived ideas or predictions – and to gain a deep understanding of a complex phenomenon. Other authors are reporting using the same or similar techniques to improve accessibility to their disciplines (Bradbeer, Healey and Kneale, 2004; Atkinson and Pugsley, 2005.)

The ethnographic process and the digital geography research project

The research project proceeded along the following lines:

Preliminary meeting with the Level 3 Advanced Digital Geographies students (sample size 8) – ‘those who can, do’. Because this Level 3 module is optional, the purpose of this meeting was to establish why they chose to follow a ‘difficult’

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module. It allowed us to frame questions, should they be needed, for the Level 1 ethnographic research that was to follow and was the main focus of the research project

Selection of Level 1 students (sample size 10) who had followed the introductory Digital Geography module and had already declared an anxiety with conducting digital geographies – ‘those who can’t, don’t’. These Level 1 students will all follow the compulsory Level 2 module in September 2006 and are the target for the ethnographically revamped module

Ethnographic research with the Level 1 students by a digital questionnaire to elicit qualitative and quantitative data (the same format will be used following the compulsory Level 2 Digital Geography module that this cohort will take in September 2006). This was followed by a one-hour group discussion with GL as a participant observer

Research findings summary

The Level 3 Advanced Digital Geographies students reported the following :

- They found the content and techniques of the Advanced Digital Geographies module ‘easy’ to understand and follow and, as such, it was an obvious module to select because they knew they would succeed with it.
- Graphics packages (Canvas™) taught in Level 1 and 2 courses served as good preparation for multi-layered GIS packages.
- The majority had purchased, or arranged access to the use of, a suite of digital geography software that allowed them to practise with it at home. They insisted that they had all learned to use it proficiently, and with pleasurable understanding, as a consequence of this home access.

The Level 1 students, who had followed the more general digital geographies course component as part of their research techniques module, reported the following detail:

- They found the CAD component of the module, delivered using Canvas™, relatively easy and thought it was good preparation for the GIS that was to follow.
- However they felt intimidated by GIS – ESRI ArcGIS™ version 9.1. They found it difficult, confusing and were overwhelmed with the volume of data/information presented often at the same time on screen.
- They wanted to see the end product of a class exercise first before they completed an exercise themselves.
- They wanted more help/assistance with the practical work – but did not like the suggestion that paid student buddies might be made available. They thought that the buddies might be placed in an invidious position outside their paid hours if assistance was requested from them.
- They wanted simpler handouts in addition/instead of the recipe sheets they are normally provided with.
- They found the screen layouts confusing and multiple screens difficult to work with.
- They wanted a ‘show me how to do’ facility for the times when they got stuck on accessing menus or performing a routine.
- They wanted more teaching / smaller classes.
- They demonstrated a (surprising) lack of computer literacy across the sample, but mainly in the more mature age groups, despite claiming literacy based upon their gaming skills.

- They complained of network performance issues – mainly reliability, pathname/disk store naming conventions, as well as lack of (network) storage space.
- They wanted more assignments using GIS – further questioning by the observer (GL) indicated that they wished that other tutors would set assignments that required them to use digital geographies.
- They required more time to practise in less stressful/ embarrassing situations.
- They desired more comfortable and private learning space. Some reported an embarrassment block to learning when they appeared to be incompetent in the use of the software in front of their peers.

And finally,

- They wanted more computers.

The ethnographic analysis and a nascent pedagogy

Following an analysis of the summaries present in the above section, the following pedagogy has been constructed to address the issues that were raised:

- The request to show them the end-product of the exercise has been resisted on the grounds that it could damage the spirit and purpose of enquiry-based learning. It is likely that a similar end product will be revealed to them as a yardstick measure for them to emulate.
- The provision of paid student buddies to assist them has been abandoned. The module will now be delivered via a Virtual Learning Environment (WebCT™) and this will allow them to use the embedded discussion group facility where they can gain on line support from other students following the module.
- 'How to do' handouts will be made simpler and students will be asked to provide examples of how they would produce a 'how to do sheet.'
- There will be a development of Captivate™ tutorials to demonstrate 'how to do' operations. Captivate is an Adobe product and is considered to be an easy to learn e-learning development tool that combines the advantages of Microsoft Powerpoint and Flash
- All Level 1 students will be required to complete the Microsoft Digital Literacy Certificate course (<http://www.microsoft.com/citizenship/giving/programs/up/digitalliteracy/eng/Curriculum.msp>) before they access the Digital Geographies component of their Level 1 study
- Network staff have been approached regarding the network issues and they are considering simplifying the pathnames of the folders that students are required to access for data supply. However, we acknowledge that the students would be expected to cope with complex terminologies in the workplace and as such any simplification could result in a vocational disservice
- Network storage is not so much an issue as the download times experienced over our network (despite it being Novell 6.5 with a 100mb link to desktop) .We are purchasing portable hard drives (40Gb) that will be made available via a loan scheme to the Digital Geographies students

- It is acknowledged that wider use of digital geographies in other modules would be beneficial. It would help convey the value of Digital Geography and increase the students' familiarity with the software packages. This raises, but does not answer, the wider issue of GIS being currently perceived as an add-on rather than a core component of the geospatial disciplines and demands a much deeper analysis and solution than can be provided here.
- The provision of home access to the Digital Geography software suite by authentication to the University's geography server is by far the greatest innovation to follow the ethnographic analysis. Providing the student has a broadband connection and a static IP address, this will allow them to access costly (over 2500) software at any convenient time and in the comfort and privacy of their home. Not only does this extend the notion of e-learning but addresses their desire for comfortable and private learning spaces where any peer group engendered embarrassment factor is removed

Conclusion

Ethnography has elucidated known and unknown anxieties associated with the learning of digital geographies at Edge Hill University. The ethnographic analysis has informed a nascent pedagogy that is being implemented in the 2006-2007 presentations of Digital Geography at this university. This research project is an exemplar of the SOLSTICE values (<http://www.edgehill.ac.uk/SOLSTICE/>) and demonstrates the merits of interdisciplinary collaboration. The findings of the ethnographic analysis which is to be conducted with 2006-2007 Level 2 Digital Geography students will be published in due course.

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