

and university admission of disabled students. DEMOS is also releasing a module on assessment issues (in late February) and in the summer will make available another generic module on teaching and learning issues. These learning modules are enriched with a number of further resources - web links, further reading, a database of student experiences from interviews with students and case studies where possible. As the information on the site grows, the learner will be able to explore these resources and hopefully find the answers they are looking for. The content is being underpinned by a social model of disability (one that looks at the social construction of disability rather than an individualistic medical model) and also by an appreciation of the impact of the Special Education Needs and Disability Act (2001). We have also tried to interweave some interactivity into the materials with learning activities and hypertext links to external resources. An analysis of need is an ongoing feature of the project and modules have been written for academic staff with academic staff acting as members of each module writing team. The materials are also being independently checked for quality by an external representative who is a respected academic in the field.

The challenge for the rest of the project's lifetime and indeed for those interested in utilising the materials developed is how to embed the tool within a delivery method that has meaning for the academic staff it is intended to reach.

Information about the DEMOS project is available at our website: (<http://www.demos.ac.uk>).

Finally, DEMOS is looking for groups of staff to try out the materials. If you are interested or would like to know more, please contact the author below.

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The Teachability Project: Creating an Accessible Curriculum for Students with Disabilities

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Abstract

The Scottish Higher Education Funding Council (SHEFC) Teachability Project is about making the higher education curriculum accessible to disabled students, an aspiration which will soon become a legal duty on HE providers. The experience of St Andrews' School of Geography and Geoscience shows that it is possible to make disciplines with strong fieldwork components accessible to students with mobility and visual impairments — it also shows that implementation of 'Teachability' can benefit all students, not just those who are disabled. This article will be of interest to other disciplines, such as Environmental Science, which also have fieldwork components.

Introduction

The School of Geography and Geosciences at the University of St Andrews is one of 62 academic departments to have used the resource materials developed in the Teachability Project to do two things: to self-audit and evaluate current curricular provision for disabled students; and to identify a strategy for enhancing that provision. This article briefly describes some key features of the project, which was piloted by the Geoscience staff within the wider Geography and Geoscience school at St Andrews. Some further information about the Teachability project is also included in the article by Adams in this special edition of PLANET.

Background to the Project

The SHEFC-funded Teachability project commenced in January 1999. A partnership of five West of Scotland HEIs, involving disabled students, a range of academic departments, Teaching and Learning units and Disability Advisers developed a resource booklet and — at least as important — a recommended process for its use. The resource booklet is intended to be used by academic departments, supported, where this is helpful, by those in the institution with specialist knowledge of the ways in which the design and delivery of curricula can impact on the learning experience of disabled students. Through a process of self-audit, academic departments are asked to reflect on the ways in which their current curricular design and delivery are accessible – or not – to current and future disabled students.

Departmental Self-Auditing

The academic self-audit rests on an understanding of key ideas, such as 'inclusive teaching practice', 'core course requirements' and a sense of what it is that aids or inhibits access to the curriculum for disabled students. However, the concerns of Teachability extend beyond notions of inclusive practice. While it may be the case that the needs of many disabled students are met by good, inclusive teaching practices, it is also true that the participation of some disabled students on some courses will require consideration of needs which are specific to the individual. The goal of Teachability, which matches with the 'anticipatory duties' articulated in the Special Educational Needs and Disability Act, 2001, is that curricular provision should be as ready as possible for diverse learners and that the notion of "diverse learners" should be informed by knowledge of the generality of disabled students' needs. When that is achieved, *ad hoc* reaction to individual disabled students becomes less necessary. At the same time, where barriers to access continue to exist for some disabled people, creative "one-off" solutions can often be found by academic staff. Experience at St Andrews suggests that such solutions can develop into a more universal practice which enhances access to the curriculum for all students.



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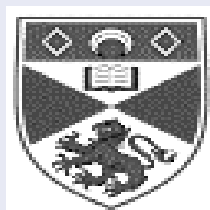
The work of the Geography and Geoscience School at St Andrews exemplifies the 'Teachability' process of departmental self-audit at its most productive. A day's introduction of the project to Geoscience, Modern Languages and Divinity staff at St Andrews, sought to explore the central themes of inclusive practice, alternative adaptations, and, most importantly, the notion of 'core course requirements'. The departments' critical self-audits were then co-ordinated by those who had been present at the introductory day.

The starting point of the accessible curriculum enquiry should be clarity about what is at the heart of the course, about what in the content and delivery of the course is negotiable and what is non-negotiable. Only then is it possible to move on to thinking about alternative ways of meeting core course requirements. Moreover, it seems vital to consider the possibility and consequences of limits to the participation of some students on some courses, while nevertheless looking for ways of pushing these limits. These considerations will be crucial for departments grappling with the duties imposed by the Special Educational Needs and Disability Act, 2001, to make 'reasonable adjustments' and not to discriminate through 'unjustifiable exclusions'.

The following extracts are taken from the Teachability report written by Ed Stephens (Head of the School of Geography and Geosciences at St Andrews). They are drawn from a much lengthier report, and have been selected to demonstrate two things: (i) the exemplary use by St Andrews Geoscience staff of the Teachability self-audit and, related to that, (ii) the innovative ways identified by the department of enhancing access to the curriculum for present and future disabled students.

School of Geography & Geosciences University of St Andrews

Teachability Project Creating an Accessible Curriculum in Geoscience for Students with Disabilities at the University of St Andrews



Introduction

This report is an analysis of the curriculum in Geology and Geoscience at St Andrews University from the standpoint of accessibility to students with disabilities. Training in geological sciences involves major field and laboratory courses as well as more traditional lecture and formal examinations. The report aims primarily to identify those aspects of current provision that appear to inhibit access to the course for various forms of disability, and it concludes with proposals for improvements.

Hitherto, *ad hoc* solutions have been devised and implemented (generally successfully) for students with disabilities but it is proposed that a more formal procedure be adopted. Full participation in the curriculum of students with impairments is the goal of the new course and steps to achieve this are outlined. Considerations of disabilities issues will be included in future curriculum development. Significant problems still remain to be resolved and some of these are identified.

Data for this report were gathered from several sources during the academic session 2000/2001. Each member of teaching staff was surveyed for the arrangements they make for disabled students, and the data were compiled for a meeting of the Geoscience Teaching Council which considered the issues.

Core Requirements for the Geoscience Course

Geoscience is rooted in traditional Geology but differs by its emphasis on the Earth's surface and its interaction with humankind.

The new curriculum at St Andrews is wholly consistent with the QAA Benchmark for Earth Science, Environmental Science and Earth studies (ES³) and its stress on field training amongst a range of practical skills.

Accessing the Geoscience curriculum for students with a range of impairments

1) The General Case

In line with University policy on equal rights and opportunities no prospective student has been denied access to the Geology or Geoscience courses. Students with various mobility impairments, sight impairment and post-viral conditions have successfully completed modules.

2) Specific cases

a) Mobility Impairment

Field courses present the biggest challenge to the Geoscience curriculum. Many important field localities used throughout the course are difficult to access. Alternative sites which are more accessible are sometimes available. We have carefully considered the contents of each field excursion and course and have students at Honours level undertaking alternative approaches to the same learning outcomes. Some teaching staff were initially reluctant to accept the equivalence of training, but have been convinced that this can be achieved. Examples of alternatives to site visits include:

- virtual field excursions
- video records of field excursions
- photographic displays
- use of samples collected *in situ*
- core logging

The School has a policy to train a technician in creating virtual field excursions. This has now started and the appropriate software (Macromedia Authorware, TRIADS implementation) and digital cameras have been purchased. Over the next few years the technician will attend all field courses and generate support material for students unable to access the outcrops. All students will benefit from this approach as it is not possible always to get the best from a field excursion, in adverse weather conditions such as horizontal sleet in the Highlands. This is a good example of how the whole class can benefit from an action originally designed to assist disabled students.

b) Visual impairment

Accessing the curriculum is presently being addressed by working closely with a willing visually impaired student and the University's Disabilities Adviser. All course handouts are provided in advance in enlarged format and all staff have indicated their willingness for a tape recorder and small telescope to be used in lectures. In laboratory classes microscope work provides the greatest challenge and this has been successfully met by attaching a small video camera to a standard polarised light petrological microscope, with the image signal being fed into a personal monitor. With this aid, the student can examine all the class material. Hand specimens are examined with the aid of hand lenses and other appropriate magnification tools. The classes are supported by demonstrators who can spend time with any student requiring extra assistance.

Field excursions are an additional challenge. The intention has been to use a companion to act as "buddy" in the field to describe the features and ensure safety.

We have not yet fully addressed the issues of how a student with no visual capability may access the curriculum.

Improving Accessibility to the Curriculum

1) Curriculum-based approaches

At the heart of curriculum development is the learning outcome, and generally the best or most efficient route to that outcome is chosen. Recent efforts to cater for various disabilities have shown that alternative routes to the same learning outcome are possible, often without much extra demand on resources. Future curriculum developments should aim to identify various means of achieving the same learning outcome, some of which should cater for various impairments.

The main learning outcome of most field courses is the ability to make appropriate and accurate observations leading to an interpretation of some aspect(s) of the geology. While physical impairments may hinder the collection of raw data in the field (but other opportunities to acquire such data may be possible), the intellectual challenge of interpretation is common to all students regardless of impairment. Thus field courses should examine alternatives to the traditional means of acquiring the necessary data. Lab classes have analogous issues relating to primary observations, for instance visually impaired students using the microscope. Similar strategies may be adopted.

In parallel with the skills training and intellectual training aspects, care must be taken to make sure that assessments are similarly designed to cater for impairments. A fair system will allow all students to acquire the necessary information in a manner appropriate to the individual situation, but it must be clear that the level of challenge is the same. For example, if a visually impaired student is given much longer to acquire data in a lab test, it is important that the class as a whole appreciates the reason. The "level playing-field" must be related to the challenge involved not some more arbitrary variable such as time. Similarly, a physically disabled student might be asked to log a rock section in a series of road cuttings whereas the remainder of the class may be asked to log some crags or river cuttings. As long as the difficulty in interpreting the geology is comparable, such strategies should be acceptable to all reasonable students.

2) Teaching and Assessment Aids

Major progress has been made in recent years in the area of Computer Aided Learning in Geology. Several CAL modules were created (including one at St Andrews) and they were particularly effective in assisting students to understand principles from atomic scale to global scale processes. These were not designed specifically to assist students with impairments but are nevertheless useful. The new generation of IT applications is facilitating the creation of excellent field simulations. We envisage that in the next few years a wide variety of software will become available both nationally (co-ordinated by the LTSN Subject Centre for Geography, Earth and Environmental Sciences) and locally using TRIADS software and in-house expertise. The web is also a growing source of useful "virtual fieldtrips".

3) Barriers to Change

a) Awareness

This is perhaps the biggest barrier. Participating in the Teachability project has been successful in raising awareness. It has also demonstrated the value of being proactive in seeking solutions and that solutions to seemingly impossible problems are sometimes relatively straightforward. The process has also helped teaching staff in the School to think carefully about learning outcomes and the possibility that these can be achieved in new and different ways. Raised awareness is, however, not in itself

sufficient to ensure total access to the curriculum for a whole range of impairments and real barriers still need to be overcome.

b) Training

Specific training of teaching staff will occasionally be necessary. For instance, it might assist a deaf student if all staff were trained in lecturing styles that accommodate lip reading (describing slides in a dark lecture theatre is unhelpful but this is perhaps not obvious to everyone unless pointed out). Teaching staff and lab demonstrators might gain from a better understanding of how dyslexia and related impairments might influence three-dimensional thinking, a potentially important attribute in understanding rock structures.

4) Communication of Accessibility

Promotional literature is clear about the extensive field component of the Geoscience course. Applicants are encouraged to contact the School to discuss the implications of any disability with regard to fully participating in the course, yet few do so. Course handbooks will therefore be rewritten in more positive and inclusive language.

With the best will in the world, there will be circumstances when accessing the curriculum becomes so difficult because of a particular impairment that it may be considered unwise to encourage the student in this direction. Field training is at the heart of the St Andrews course and so this degree programme might seem an unwise choice, but there would be no formal barrier to participating. Medical advice based on information supplied by the School would help the student make an informed decision.

Conclusion

Adapting the Geology/Geoscience curriculum, with its traditional image of physical challenge, to make it accessible to the whole range of potential students requires careful planning. Nevertheless, the experience gained on this Teachability project suggests that much progress has been made and, with some thought and modest resources, a lot more is achievable. Although many recent changes have been introduced in response to new legislation, it will be to the benefit of the subject and to society at large when barriers to accessing the Geoscience curriculum have been removed, or at least made manageable. This will enable the whole community to be represented among our graduates.

For further information about the experience of applying Teachability in the discipline of Geoscience at St Andrews, please contact Ed Stephens, Head of the School of Geography and Geosciences
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You can view the Teachability resource booklet materials at the web-site, <http://www.teachability.strath.ac.uk/>

Copies (at £5.00) may be purchased by contacting the Project Manager below.

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