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# Enabling Remote Activity: Using mobile technology for remote participation in geoscience fieldwork

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Field-based activities are regarded as essential to the development of a range of professional and personal skills within the geosciences. Students enjoy field activities, preferring these to learning with simulations (Spicer and Stratford 2001), and these improve deeper learning and understanding (Kern and Carpenter, 1984; Elkins and Elkins, 2007). However, some students find it difficult to access these field-based learning opportunities. Field sites may be remote and often require travel across uneven, challenging or potentially dangerous terrain. Mobility-impaired students are particularly limited in their opportunities to participate in field-based learning activities and, as higher education institutions have a responsibility to provide inclusive opportunities for students (UK Disability Discrimination Act 1995, UK Special Education Needs and Disability Rights Act 2001), the need for inclusive fieldwork learning is being increasingly recognised.

The Enabling Remote Activity (ERA) project has been investigating how mobile communications technologies might allow field learning experiences to be brought to students who would otherwise find it difficult to participate, and also to enhance activities for all participants. It uses a rapidly deployable, battery-powered wireless network to transmit video, audio, and high resolution still images to connect participants at an accessible location with participants in the field. Crucially, the system uses a transient wireless network, allowing multiple locations to be explored during a field visit, and for plans to be changed dynamically if required.

Central to the concept is the requirement for independent investigative learning: students are enabled to participate actively in the learning experience and to direct the investigations, as opposed to being simply remote viewers of the experience. Two ways of using the ERA system have been investigated: remote access and collaborative groupwork.

In 2006 and 2008 remote access was used to enable mobility-impaired students to take part in and complete a field course. This involved connecting the student in an accessible vehicle located close to the field site, via a wireless network, to a geologist in the field. The geologist worked alongside the general body of students and the field tutor as each geological site was investigated. Two-way communications allowed the student to guide the geologist to provide video panoramas of the area, to select areas of interest for further study and to obtain high resolution images of specific points. The students were able to work through the field activities alongside the rest of the student group.

A collaborative groupwork trial (2007) was used to connect two groups of students; one in an accessible laboratory, the other at a field site. Traditionally, students collect data in the field and analyze it on return to the laboratory; this system proposes a more rapid collection and analysis procedure, with information being transmitted between sites with field and laboratory participants having their own distinct, significant roles within the learning activity.

This project recently received an award at the 2008 Handheld Learning Conference and a HEFCE sponsored Open University Teaching Award.

In contrast to the use of 'virtual fieldwork' that aims to provide simulations or a resource for a student to use, the focus of this project is on how technology can be used to support actual fieldwork activities. This approach has been trialled now over three field seasons, with students using the system to remotely participate in fieldwork activities. Interviews with tutors and students have shown that this was perceived as valuable and allowed participants to achieve the learning objectives of the course alongside their peers. The challenges of remote fieldwork concern the co-ordination of students' activities, the integration of remote and field activities and practical issues of lightweight, easy-to-use, robust technologies and the provision of a reliable communications network.

References

Elkins, J.T. & Elkins, N.M.L. (2007) Teaching geology in the field: significant geoscience concept gains in entirely field-based introductory geology courses. Journal of Geoscience Education, 55 (2), 126-132.

Kern, E. and Carpenter, J. (2004). Enhancement of student values, interests and attitudes in Earth Science through a field-oriented approach. Journal of Geological Education, 32 (5), 299-305.

Spicer, J. I. and Stratford, J. (2001) Student perceptions of a virtual field trip to replace a real field trip. Journal of Computer Assisted Learning, 17(4), 345-354.