MOBILE LEARNING IN THE NETHERLANDS: POSSIBILITIES OF USE OF REAL-TIME DATABASE ACCESS IN AN EDUCATIONAL FIELDWORK SETTING

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Abstract

Mobile technology offers new possibilities to support students during fieldwork. With handheld devices or Pocket PC's students can take their learning materials everywhere they go. When a Pocket PC Phone edition or a bluetooth connection is used, connectivity to networks is added. Browsing the web, sending and retrieving information and various modes of communication become possible.
In our project we search for ways to use two new tools to support mobile learning:

❐ Blackboard[unplugged] is a very recently delivered 'building block' extension of Blackboard to support the use of learning materials on small mobile devices. This extension allows Blackboard users to download subsets of Blackboard webcontent on their pocket PC or to access content entirely through a wireless connection. Attention is paid to the readability of the materials when displayed on the small Pocket PC screens. Our experiences with the use of Blackboard[unplugged] in a fieldwork situation will be addressed in the presentation.

❐ ArcPad and CropViewer, resp. GIS software and a crop registration tool used by professional fieldworkers offers the possibility of storing location based fieldwork data . In our project, we look for ways to send these data to a remote server using GPRS-technology. When a functionality is added that gives the opportunity to view previously recorded data, in our view a rich fieldwork learning environment is available that will give fieldworkers the same information and instant feedback that office workers have while using a LAN.

In this presentation, mainly the educational implications and some technical implications of the use of CropViewer in combination with GPS, GIS and GPRS in fieldwork will be addressed.

This work is part of the Manolo project, a two-year collaborative project between the Vrije Universiteit Amsterdam and Wageningen Universiteit.

Keywords:

Mobile learning, fieldwork, handheld devices, Blackboard[unplugged]

Introduction
In our previous project (GIPSY) it was suggested that the use of Pocket PC's might be of most educational value during fieldwork. Various experiments showed that fieldwork students value the small size of a Pocket PC in combination with its broad functionality. With a connected GPS and the GIS-software ArcPad, students are able to locate their position and insert field measurements of that position. These measurements can then be synchronized with a desktop computer for further analysis.

In this situation, incorrect measurements as a result of a wrong execution of a measurement procedure, are not identified until the student returns to the campus. In this case, just as in classroom education, it is preferable to give immediate feedback to the student.

The software
CropViewer is a GIS application thus far mainly used for agricultural applications, that allows fieldworkers to visualize a high-resolution satellite map of the fieldwork area on a handheld device. The area displayed on the device is centred on the position of the user, determined by GPS. The user can insert a point on the map and associate animal or plant species information to it, such as type, family etc. The information collected on the PDA are transferred to a permanent station at the university campus by using cradles and cables, thus giving all students access to al data gathered. The students are pleased with the fact that they no longer need to make drawings on paper of the point and later transferring these data to a computer.

Transforming to a true mobile environment
The collection and use of vegetation information can be extended when a wireless (GPRS) connection is added. Through this wireless (GPRS) connection, each newly added crop point and associated point information is sent to a central server in real-time. In this case the information is stored both locally and sent remotely. It gives the possibility of exchanging data remotely between different field teams and the office. This allows monitoring of the whole field campaign and allows the introduction of process optimizations.

Since fieldwork locations are often remote and involve significant travel time, it is clear that the time spent on-site should be used effectively. For example, CropViewer enables students to immediately compare current results with previous findings. Students may be engaged in an exercise to learn the skills to test the water quality. They are provided with instructions to do water tests and are asked to report on their results. In a normal situation, students do the tests, return to the university, and discover that their results are either correct or incorrect. If the results are incorrect, they have to return to the spot and conduct the tests again. In a mobile fieldwork situation, students can do their tests, send the information to a remote server, and compare their results with the information available at this server. They will now see immediately if their results are correct or incorrect, and if necessary can redo the experiment on-the-spot. In this way the fast feedback will provide a better way of learning, as from a pedagogical standpoint it is advised that the correction of a mistake should take place as soon as possible.

Thus far, small scale experiments show that GPRS can provide a reliable connection, that can be useful in the field. Connections are slower than normal LAN, but will increase hopefully when EDGE becomes more widely available.

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