

# Evaluation of a Mobile Learning Organiser and Concept Mapping Tools

Mike Sharples, Tony Chan, Paul Rudman, Susan Bull  
Educational Technology Research Group  
*Department of Electronic, Electrical and Computer Engineering*  
*University of Birmingham*  
*Edgbaston*  
*Birmingham B15 2TT*

Email: m.sharples@bham.ac.uk, chantks@eee-fs7.bham.ac.uk, pdr889@bham.ac.uk, s.bull@bham.ac.uk

## Abstract

*We describe a Mobile Learning Organiser that has been trialled with university students. The aim was to investigate whether an integrated set of learning tools would be useful, which tools would be adopted, and the contexts in which the tools would be used. The results show no single favoured application. The most frequent activities were reading email, note taking, managing deadlines and appointments, and listening to music. The main reported limitation, apart from battery life, weight, and processor speed, was the loss of wireless LAN connectivity, and thus usefulness, when outside the university department.*

*A comparative evaluation was also carried out between one of the learning organiser tools - a tree structured concept map - and a more traditional style free-format concept map. The results suggest that each concept mapping tool may be suited to different tasks and type of user.*

*Keywords: learning organiser, iPAQ, wireless LAN, learning tools, concept maps*

## 1. Equipment and software

Mobile office organisers are becoming indispensable tools for many professionals. Learners at university, college or school have as broad a range of demands for self-organisation as professionals, but their requirements are somewhat different: to attend classes, meet course deadlines, read and understand teaching material, revise for exams, and manage

individual and group projects. This paper describes a project to evaluate software for a Personal Learning Organiser (see Holme & Sharples, 2002).

Eighteen students taking an MSc in Human Centred Systems at the University of Birmingham were loaned an iPAQ handheld computer with a wireless LAN sleeve and docking cradle. The sleeve provides high speed access to web pages, course material and email within the university department. The docking cradle enables those with computers at home to synchronise their calendar, notes and documents, and to transfer software.

Students were given three types of software:

- (1) An integrated suite of learning tools developed at the University of Birmingham, comprising: a Time Manager with a timetable showing teaching periods for the day and course deadlines; a Course Manager with course material in Microsoft Reader format; a Communication Centre for email, text messages and contacts; Map-it!, a concept mapping tool to create a visual map of notes and documents. Students could download material for teaching modules, including PowerPoint slides and supplementary texts, through the wireless LAN connection.
- (2) The standard set of PocketPC applications, including email, Internet Explorer, Windows Media Player, and pocket versions of Word and Excel.
- (3) Software that the students downloaded. It was made clear that they could use the device for their own personal use and entertainment.

## 2. Evaluation: Learning Organiser

Students completed detailed questionnaires about their iPAQ use after 4 and 16 weeks. After 4 weeks, 64% (n=17) were using the iPAQ at least once a day. This fell to 42% (n=14) after 16 weeks (possibly due to course requirements at the time). There was no single favoured application. The most frequent activities were email, note taking, managing appointments and deadlines, and listening to music.

The most popular tools are shown below, with the first figure being the percentage of students reporting 'useful' or 'very useful' after 4 weeks, and the second, the percentage after 16 weeks. email (76%, 79%); timetable and deadlines (59%, 64%); web browser (65%, 64%); instant messaging (59%, 50%); course materials (59%, 43%); supplementary materials (53%, 43%); concept mapper (35%, 14%). Logbooks showed locations of use to differ quite widely across users (Bull, 2003). The popularity of email, messaging and timetable (despite these also being available on desktop machines) suggests the importance of mobile organisation and communication tools to enable students to manage their learning. The main reported limitation, apart from battery life, weight, and processor speed, was the loss of connectivity, and thus usefulness, outside the department.

## 3. Evaluation: concept map tools

Due to the low use of the concept map tool, a comparative evaluation was also carried out of Map-it! and another concept mapping tool: Concise Concept Mapper (CCM) also developed at the University of Birmingham (see Figure 1).

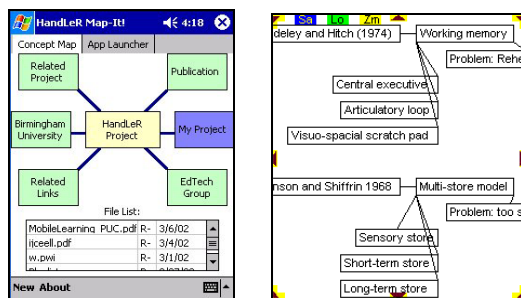


Figure 1: Screenshots of HandLeR Map-It! And Concise Concept Mapper

A concept map is a tool for recording and organising information through visual semantic association. The exercise of structuring ideas to create a concept map can encourage reflection and understanding. While both mapping tools

described here are optimised for pen-based interactions on a small screen, they have significantly different operation.

HandLeR Map-It! (Chan and Sharples, 2002) uses a logical tree structure whereby one node is shown as central with linked surrounding nodes. Navigation is by clicking on one of the outer nodes which brings it to the centre, displaying the topics related to it. Clicking on the centre node displays any document associated with the node. The user adds a new node by selecting a document from the file list, which attaches it to the central node.

CCM uses a free-form concept map based on user-positioned nodes and links (Rudman et al., 2002). Interaction is by pen gestures, e.g. dragging a box moves it to follow the pen. If the pen reaches the edge of the screen, it scrolls the map in the direction of the arrow. A zoom facility displays a compressed version of the entire map, giving an overview of its structure. To add a new node at an unoccupied place, the user taps at that point, opening an input area for the node's text. This node may be attached to the map by dragging it over another node.

The results suggest that each tool may perform best in different situations. CCM performs better for note taking and organising information with no obvious structure; it is also more suited to experienced users. On the other hand, Map-it! is better at presenting highly structured information and organising documents by semantic relations; it is also more suitable for novice or occasional users.

## 4. References

- Bull, S. (2003). User Modelling and Mobile Learning. To appear in *UM2003: Proceedings of the Ninth International Conference*, Springer-Verlag, Berlin Heidelberg.
- Chan T.K.S., Sharples M. (2002). A Concept Mapping Tool for Pocket PC Computers. In *Proceedings of IEEE International Workshop on Mobile and Wireless Technologies in Education*, Vaxjo, Sweden, 163-164.
- Holme, O. & Sharples, M. (2002). Implementing a Student Learning Organiser on the Pocket PC Platform. In *Proceedings of the European Workshop on Mobile and Contextual Learning*, Birmingham, UK, 44-46.
- Rudman P.D., Sharples M., Baber C. (2002). Supporting Learning in Conversations using Personal Technologies. In *Proceedings of the European Workshop on Mobile and Contextual Learning*, Birmingham, UK, 44-46.