

Comfort + ubiquity = adoption: Enhancing first year students' communication skills with handheld computers

Beverley Oliver and Corri Barrett

*Learning Support Network
Curtin University of Technology*

Researchers at Curtin University of Technology have received corporate sponsorship for an ambitious international project examining the learning benefits of integrating the use of handheld computing devices into undergraduate communications skills units. The project aims to determine whether common conceptions of young students' comfort with portable communications technologies translates into increased engagement with learning resources and activities when channelled via wireless networks to readily available computing devices.

Keywords: handheld computers, mobile technologies, communication skills, first year experience

A handheld computer, also known as a personal digital assistant (PDA) is a small, mobile device that provides computing and information storage and retrieval, and that can be easily carried and used (British Educational Communications and Technology Agency, 2004; Deneen, 2001). The more sophisticated PDAs offer cut-down versions of common applications and tools such as email, task lists, calendar, web browser, handwriting recognition software and more. Most PDAs are designed to work in tandem with more full-featured personal computers and the software can readily be synchronised by linking the devices physically or remotely via infra-red or wireless protocols such as Bluetooth and 802.11b; most recent devices can access the internet via the same wireless cellular, wireless network or traditional wired connections. Many handheld computing devices incorporate digital cameras, voice recorders and MP3 playback. The most recent developments involve the convergence of data and voice telephony with mobile handheld computing. Now mobile telephone subscriptions are outstripping fixed line connections for the first time (International Telecommunications Union, 2004), and the take-up of mobile internet access is increasing steadily, especially in the Asia-Pacific region.

The advantages due to the size and versatility of these devices are noteworthy: they are highly portable with a long battery life; they are simple to use and start quickly ('instant on'); and many are significantly cheaper than desktop or portable personal computers (PC). However, their functionality and potential for expansion and upgrade are more limited than larger PCs, and compatibility issues are not unknown between certain brands of handhelds and standard PCs. A clear market leader has yet to emerge and therefore the sector continues to suffer from the lack of de-facto standard (Caughlin & Vincent, 2004). While long enjoying popularity as an information tool for business executives, the handheld has more recently been used in teaching and learning in universities, particularly in the United States (Cavill-Smith & Kent, 2003; Jones, Johnson, & Bentley, 2004; Oliver & Wright, 2002). Bates and Poole point to greater penetration within a relatively short time, with PDAs finding application in quite practical education contexts such as the ward based training of medical students (Bates & Poole, 2003). More recent analysis (Yanosky, Harris, & Zastrocky, 2004) continues to highlight problems with device integration as a limiting factor in widespread higher education adoption.

Beyond technical issues, there appears to be limited research on the use of PDAs in effecting better learning outcomes in higher education although more substantial literature reviews are beginning to emerge (Cavill-Smith & Kent, 2003). The research and uptake of handhelds is also largely being driven by commercial interests: so far university students have been slow to voluntarily adopt the handheld as a learning tool (Jones et al., 2004; Oliver & Wright, 2003). Results of recent Australian research suggest (Oliver, 2004, in press) that, at this stage, students are aware that this technology exists, and the vast majority have seen or used one, or would like to. Of those who had not yet seen or used the PDA, half were keen to do so. Those who were negatively disposed towards the PDA (about 25% of the total

sample) cited cost and a lack of utility as the reasons. These results suggest that, in a potential 'market' for the PDA, there is, overall, a positive attitude towards this technology, but a significant proportion (25%) believe it is too expensive or 'not useful'. One possible reason for this perception is that most of the functions of the PDA are catered for by desktop and laptop computers and, more recently, by multi-function mobile telephones. With the advent of wireless networks becoming more available on campus and beyond, it is expected that this perception might change rapidly.

Further to this earlier research, this paper reports on a new research project which, supported by industry, allows a deeper investigation into the achievement of learning outcomes by first year university students using handhelds. In this project, first year Engineering and Business students (in Australia, Africa and Malaysia) will use handheld technologies to communicate with peers and teachers and to build portfolios to map their progress in achieving key learning outcomes in research and academic writing. Most importantly, these students will be able to engage more readily with their peers in vastly different contexts—communicating across cultural boundaries in the informal modes afforded by the medium. In 2005 and 2006, two cohorts (each of 60 students) of first year students will be supplied with handhelds for semesters one and two (March to November). At the end of that time, changes in students' self efficacy and ability to perform research and communication tasks will be mapped to their level of engagement with the technology. The results of both cohorts will be used to analyse:

- students' level of engagement with learning using handheld technologies;
- the link between handheld technology and improvements in students' communication abilities; and
- students' take-up of handhelds before, during and after the project.

First year Engineering and Business students in Australia are predominantly male school leavers who typically resist learning in communication: their research and writing skills are often not their primary strength. At the same time, many have increasing access to online learning experiences. While this is generally successful with older and postgraduate students, first year students sometimes lack real interest in accessing learning experiences online (Oliver, 2001). In contrast, these first year students are typically heavy users of mobile telephones, driven by a need to communicate. It may be that they resist online learning because course websites provide more passive information, and to use them they usually have to be in public spaces (in computer laboratories, or in homes) sitting upright and using keyboard input. This all makes learning a formal, timetabled event rather than part of 'what you do'. The aim of this project is to investigate whether the more informal postures and places of the handheld learning tools encourage students to tap into their social habits with their mobile phones: do students use online learning materials and experiences as readily for learning as they might use a mobile for socialising when the handheld is portable and wireless enabled? Handhelds have the potential to encourage the younger university student to engage more with learning experiences because, like phones, these devices are 'always on', have better online coverage, can be used in more personal spaces (either sitting or lounging) and allow several input methods, including handwriting (British Educational Communications and Technology Agency, 2004). This handheld research project aims to build on younger users' comfort zones by seeking to transfer their established habits of communicating with mobile phones to engage more with their learning by accessing key materials online, and by communicating with peers and teachers both locally and internationally on key communication projects.

Both quantitative and qualitative measures will be used to assess the results of student learning and engagement. Validated quantitative instruments will be used to measure changes in students' self efficacy and ability in research and communications tasks will be collected during each cohort's first semester at university. The data gathering instrument, which has been piloted in 2003, was designed by a group of experts in the field, and is an amalgam of instruments used in previous separate research projects (Brigulgio & Atkinson, 2003; Oliver, 2001). It has three parts: Part A asks students to report their level of self efficacy in three areas -finding materials using the Internet, finding academic journals, and communicating complex ideas in correct written English (Oliver, 2001). Parts B and C test students' ability in the same four areas (finding research materials using the Internet, finding academic journals, and communicating complex ideas in correct written English). Part B consists of two questions in which students are asked to describe how they would go about finding research materials using the Internet, and academic journals (Oliver, 2001). In Part C students are asked to write an essay style response on a choice of topics. Using a marking guide, tutors assess the students' level of research and communication competence in Parts B and C (and in Part C they assign each answer a level competence: Outstanding,

Successful, Competent, Modest, Poor and Extremely poor). This instrument will be administered to a large group (about 1000 students) in the beginning of the students' first semester; the results will be used to select those who will be invited to participate in the handheld project. The handheld users' group will be a representative sub-sample of students whose level of competence is judged to be in need of a level of support (that is, Competent, Modest or Poor) to be successful at university.

In addition, interviews at the end of the students' first and second semesters will allow investigation into how they used (or not) their handhelds to engage with peers and learning experiences. Because this project sits within a wider First Year Communication Skills Research Project (which uses the same instruments), changes in students' self efficacy and ability (using handhelds) will be comparable with a much larger sample of their peers who accessed the same course materials and experiences through desktop devices. Benefits gained by the handheld group will be clearly identifiable. Results will be available for variables such as gender, location, first language, level of experience with technology and discipline.

This project is currently in its earliest phase of establishment. There is no doubt that there will be many issues and difficulties to overcome—new and emerging technologies take time to be implemented, adopted and exploited. Nevertheless, it is envisaged that, as well as adding to the research in the implementation of mobile technologies in higher education, this project will have at its core the exploration of the usefulness of mobile devices in achieving quality learning outcomes in the communication and research capabilities of first year undergraduates. While adopting such technologies might take institutions beyond their comfort zones—both financially and technologically—it is hoped that the ubiquitous nature of the mobile computer will allow students to learn more readily in their comfort zones.

References

- Bates, A. W. & Poole, G. (2003). *Effective teaching with technology in higher education: Foundations for success*. San Francisco: Jossey-Bass
- Briguglio, C. & Atkinson, D. (2003). Assessing the English literacy skills of a group of first years business students: Just how much diversity is there? *Proceedings Teaching and Learning Forum*, Murdoch University, Perth. <http://lsn.curtin.edu.au/tlf/tlf2004/abstracts.html#briguglio>
- British Educational Communications and Technology Agency (2004). *What the research says about portable ICT devices in teaching and learning*. 5 Aug 2004, verified 23 Oct 2004] http://www.becta.org.uk/page_documents/research/wtrs_portictcs.pdf
- Caughlin, J. & Vincent, T. (2004). *Handhelds for teachers and administrators: A complete resource for using handhelds in grades K-12!* Watertown MA: Scholastic.
- Cavill-Smith, C., & Kent, P. (2003). *The use of palmtop computers for learning: A review of the literature*. London: Learning Skills Development Agency.
- Deneen, L. (2001). *Handheld PDAs and wearable computing devices*. Educause. [1 Dec 2001, verified 23 Oct 2004] <http://www.educause.edu/ir/library/pdf/DEC0101.pdf>
- International Telecommunications Union (2004). *Is the Internet mobile? Measurements from Asia-Pacific*. International Telecommunications Society Asia-Australasian Regional Conference, Perth, 22-24 June 2003. [30 July, 2004, verified 23 Oct 2004] <http://www.itu.int/ITU-D/ict/papers/2003/Measuring%20mobile%20Internet.pdf>
- Jones, C. G., Johnson, D. W. & Bentley, J. (2004). Role preference: Are handheld computers an educational or a personal technology. *Journal of Information Systems Education*, 15(1), 41-53.
- Oliver, B. (2001). *The Effect of Web-enhanced and Traditional Instruction on the Information Literacy, Self-efficacy and Transition to University of Beginning Undergraduates*. Unpublished Doctoral thesis, University of Western Australia, Perth.
- Oliver, B. (2004, in press). Higher education students' use of and attitudes towards using handheld computers in their studies
- Oliver, B. & Wright, F. (2002). The next big thing? Exploiting channels and handheld computers for student learning. Paper presented at the Teaching and Learning Forum, Perth. <http://www.ecu.edu.au/conferences/tlf/2002/pub/docs/Oliver.pdf>
- Oliver, B., & Wright, F. (2003). E-learning to m-learning: What are the implications and possibilities for using mobile computing in and beyond the traditional classroom? Paper presented at the ICICTE, Samos, Greece, 3-5 July, 2003. <http://www.ineag.gr/ICICTE/>

Yanosky, R., Harris, M. & Zastrocky, M. (2004). *The Hype Cycle for Higher Education*. Gartner Strategic Analysis Report.

Please cite as: Oliver, B. & Barrett, C. (2004). Comfort + ubiquity = adoption: Enhancing first year students' communication skills with handheld computers. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds), *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference* (pp. 709-712). Perth, 5-8 December. <http://www.ascilite.org.au/conferences/perth04/procs/oliver-b.html>

Copyright © 2004

The authors assign to ASCILITE and educational non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ASCILITE to publish this document on the ASCILITE web site (including any mirror or archival sites that may be developed) and in printed form within the ASCILITE 2004 Conference Proceedings. Any other usage is prohibited without the express permission of the authors.