

JISC

Innovative Practice with e-Learning



Case Studies
Empowering learners

Mobile learning and teaching with PDAs
Dewsbury College, Thomas Danby College and Bishop Burton College

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Background

Dewsbury College of Further and Higher Education and Thomas Danby College support predominantly urban multi-cultural communities in West Yorkshire. Both colleges make extensive use of community- and work-based outreach centres. Bishop Burton College offers a range of land-based courses and is a Centre of Vocational Excellence (CoVE) in agriculture.

Personal Digital Assistants (PDAs) have been used at Bishop Burton College across the curriculum in workshop training and fieldwork, while Dewsbury College has trialled the use of PDAs in outreach centres with an NVQ Level 3 course in early years childcare and education. At Thomas Danby College, the focus has been on supporting basic skills and English for speakers of other languages (ESOL).

The challenge

The target for Dewsbury College was to provide learners in outreach centres with similar access to learning resources as their peers on the main college campus. The ILT strategy for Thomas Danby College also identified a need to increase access to technology; both colleges aimed to support a wider range of learners' needs as part of developing personalised learning programmes.

At Dewsbury College, laptops and projectors had been used to provide access to e-learning resources off campus. However, this technology had proved heavy, had generated health and safety issues, and led to pedagogically unsound delivery methods: it was found that projecting web pages from the front of the classroom had encouraged tutor-led learning activities at a pace dictated by the tutor. Frequently, outreach centres were also ill-equipped to support technology-mediated learning.

For basic skills learners at Thomas Danby College, the ability to repeat tasks to improve their understanding and skills is vital, especially as learners often speak English as a second language. Access was needed to resources that enabled

them to practise at their own level and pace. Learners also frequently receive tuition in the workplace, which can present the same technological challenges as the outreach centres in Dewsbury.

At Bishop Burton College, learning activities take place in an outdoor environment as well as in the classroom. Students can be required to collect data in fields or workshops and in a range of conditions for later analysis. Technology, if used at all, would have to be lightweight and portable, and compatible with the operating system on the college's desktop computers.

Innovative solutions

Staff in the three colleges experimented with different approaches to producing resources for use on PDAs, using Macromedia® Flash® to build custom-made materials, creating web pages to link to video and audio files, or reformatting existing resources for use on a smaller screen.

In Dewsbury College, staff have used web pages scaled down to fit the smaller screen of the PDA, with hyperlinks to video and audio files, to support a variety of learning preferences. The use of this technology has stimulated learners' interest: having the technology in their own hands has enabled individuals to interact with the resources at a pace they can control, and has encouraged peer discussion. The same resources can be accessed on the college website by learners at home or anywhere with an internet connection, thus supporting learning beyond the taught session. The pilot is still in its infancy. However, feedback from learners is encouraging further development.

At Thomas Danby College, PDAs have been used to provide formative assessment tests for basic skills learners. This method of delivery offers 'drill for skill' opportunities on demand, with immediate feedback and explanations from the tutor. The addition of audio files has also proved valuable in supporting the learning of key vocabulary and linguistic skills by ESOL learners.

“With personalised learning and a wider clientele planned for both further and higher education, I think that we should at least explore the use of PDAs for our learners.”

Janet Pittaway, Assistant Principal, Dewsbury College

Learners at Bishop Burton College have used PDAs for recording, storing and interpreting data in a vocational context. They have found that the opportunity to take pre-prepared and relatively complex calculations into a workshop or outdoor context has usefully combined practical and analytical skills. Furthermore, the technology adds an element of ‘cool’ to workplace learning!

These trials have shown that learners do not need to have prior experience of using a computer in order to use a PDA; navigation through purpose-built resources on the PDA was in fact found to be easier for learners unfamiliar with navigating with a mouse. In addition, the mobility of the PDAs has helped to level the playing field for learners in outreach centres and those on the main campuses. The appeal and ease of use of the PDA has even encouraged learners to borrow the technology or attend sessions early in order to catch up on missed content.

The technology

PDAs vary in cost and weight to some degree and need to be chosen to suit the required use. Cost per item ranges from £150 to £600.

Dewsbury College purchased ten HP 2210 iPAQ Pocket PCs at a cost of approximately £200 per unit. These run the Microsoft® Pocket PC 2003 operating system with Pocket versions of Word and Excel and Internet Explorer. The standard installation also includes an image viewer, a version of Windows Media® Player, a sound recorder and a fully compatible version of Microsoft Outlook®. Dual memory card slots in this version of the iPAQ give extended storage capacity, enable easier transfer of data and provide the potential for wireless networking with the use of wireless cards.

The PDA uses a feature called ActiveSync® to load files or additional software from a laptop or desktop computer. Any files made for use on the PDA can be developed on a computer and then transferred to the PDA via ActiveSync.

To allow projection onto a screen, MARGI Presenter-to-Go was then purchased to connect a PDA to a digital projector.

Thomas Danby College purchased 10 HP iPAQ Pocket PCs at a slightly higher specification, but chose Macromedia® Flash® software to create Flash executable files for use as stand-alone files.

Bishop Burton College ordered 18 HP Jornada 565s at £320 per item, and three Cassiopeia® EF 800s PDAs at £625 per item, which are partly shockproof and waterproof to withstand outdoor and workshop conditions. Sufficient capacity (32 MB of memory) was required to store a database of plants containing 1,400 images.

Making it happen

PDAs vary in cost and weight and need to be selected to suit the required use. Resources will work best if they are built for use on PDAs: the small screen size will mean adjustments are necessary to view others. Web pages, for instance, need to be 220 pixels wide to ensure functionality. PDAs are also small and can easily be lost, so booking systems with clear accountability for equipment on loan is essential, as are battery charging facilities. Batteries will need charging after 4-6 hours of continuous use.

Key points for successful innovation

- Funding will be needed for the development of resources, or use of in-house technologists with knowledge of different file formats to develop or convert existing resources for use on PDAs.
- Staff champions to advise practitioners on the use of small screen devices will encourage innovative and pedagogically sound uses of PDAs.
- Linking the use of PDAs to specific targets can ensure their acceptance by practitioners.

"We have each got our own PDA which we use in groups or individually, and it's got links to the web pages. First the teacher uses them on the projector, using a laptop. We've got the same information, but we have got it in our hands, in our control."

Child care NVQ Level 3 student, Sure Start Centre, Dewsbury

Final word

PDA's have been shown to be valuable in stimulating learners in environments that do not usually offer access to technology. They can support dynamic group activities without internet connectivity by the use of beaming, but like all new technologies, it is essential that they are not put to unsuitable uses such as conveying large quantities of information in text format. Some learners may not be able to use small screen devices successfully. Accessibility issues should always be considered and alternative routes provided.

For further research

Soon, L. (2004) 'Piloting interactive Basic Skills learning materials in Community Education Centres and work places using handheld computers' – <http://ferl.becta.org.uk/display.cfm?resID=8540>

Whalley, J. and Percival, P. 'The use of PDA's and laptop computers as an effective tool for learning' – www.adveb.co.uk/mlearn

MARGI Presenter to Go – www.margi.com/products/prod_ptg.htm

Microsoft ActiveSync® – www.microsoft.com/windowsmobile/downloads/activesync37.msp



Focus on the technology – PDA

Learning and teaching potential

- Can widen participation by hard-to-reach groups.
- Can support fieldwork and vocational training.
- Can develop personal organisation skills.
- Can support self-paced learning.

Risks

- Loss of items.
- Difficulties in replacing single items if technology changes.

Support implications

- Resource production and/or adaptation.
- Staff training; equipment booking and battery charging system.

Accessibility

Benefits: A broader range of learning experiences (video, assessment, animation, audio) will benefit most learners, particularly those with cognitive difficulties. Multimedia and animation are themselves assistive technologies for many learners. Voice recording may aid those with poor note taking skills and portable access to resources gives significant benefit to learners with memory or organisational problems.

Constraints: Learners with visual impairment may find the small screen difficult to work with. Learners with motor difficulties may lack the control to operate small devices. Where sound is the prime medium, deaf learners may be disadvantaged.

Motor	Mobility	Hearing	Vision	Cognitive
✗	✓	Possible Challenge	✗	✓

Costs

- Low per item.

Added value

- High in outreach and work-based learning contexts.

Additional uses

- Sound recording and playback.

Key to the accessibility section: Ticks and crosses indicate where use of the device as described in this case study will support or disadvantage a learner with a disability. 'Possible challenge' is used where it is advisable for practitioners to check the degree of accessibility for individual learners. Definitions of the categories of disability are given below.

Motor	Difficulties in moving, controlling or coordinating movement of the body.
Mobility	Restriction in movement from place to place.
Hearing	Hearing impairment or deafness.
Vision	Visual impairment or blindness.
Cognitive	Difficulties in processing information as a result of a range of conditions, including dyslexia.

This case study is based on case studies of innovative e-learning practice collected for JISC by the Open University – www.jisc.ac.uk/eli_oucasestudies.html