

Challenges faced by modern foreign language teacher trainees in using handheld pocket PCs (Personal Digital Assistants) to support their teaching and learning

JOCELYN WISHART

Graduate School of Education, University of Bristol, Bristol, U.K. BS8 1JA
(j.m.wishart@bristol.ac.uk)

Abstract

This study addresses the challenges faced by Modern Foreign Language teacher trainees when asked to investigate the potential of a Personal Digital Assistant to support them both in their learning and in their teaching during their training year. Personal Digital Assistants (PDAs) such as the Windows Pocket PCs used in this study have previously been found supportive by trainees in other professions with a large information content. Modern Foreign Languages (MFL) was chosen as the subject for this investigation as a particularly wide range of potential opportunities specific to MFL was foreseen. These opportunities ranged from supporting student teachers' learning by enabling access to email and other internet resources wherever they were based to enabling 'on the spot' audio or video recording to support their teaching. For this investigation, seven student teachers from an MFL initial teacher training programme were loaned PDAs for the duration of their course. This paper reports on interviews conducted at the end of the training year with six of the student teachers in order to elicit their views on the PDAs they were loaned. They were all experienced information technology users and willing to explore the devices but there had always seemed to be a preferred alternative technology available either at home or in the classroom. Their reports shed much light on the current climate in schools and subject culture pressures as interpreted by student teachers in MFL departments but told us only a little about the functionality of a PDA and how it can support mobile assisted language learning. The socio-cultural context within the MFL departments where the trainees were placed meant that they did not feel comfortable about exploring the PDA functionality. They were not yet confident in their pedagogical identities and mostly felt they could not disrupt the established practice with the novel technology. However, when the devices were used, applications that appeared most effective in supporting learning to teach MFL with PDAs were those that enabled the capture of on-the-spot events and reflections. This could be either through the inbuilt recording functions, especially video, or by making notes using either the on-screen keyboard or by handwriting recognition.

Keywords: PDA, pocket PC, handheld, mobile, foreign language, teaching.

1 Introduction

There is now clear recognition that handheld devices such as the Windows Mobile Pocket PC, the iPod, other MP3 players and a whole range of Smartphones can support

MFL learning. Beatty (2003) lists the use of PDAs in his eight applications of Computer Assisted Language Learning. Chinnery (2006) describes a range of largely successful trials of mobile assisted language learning (MALL) applications that run on mobile phones and on PDAs. These mostly comprise language learning software programs and phrasebooks that are tailored for a small device and that can be made relevant to the context of the learner, though the applications described also include the use of SMS texting for tutoring and classroom voting systems. Other MALL projects integrate the use of the mobile device in the field with that of the desktop in the classroom or at home (Kukulka-Hulme, 2005a). Key affordances of mobile phones and PDAs for supporting MALL appear to be their portability, their ability to play and record audio (and often video) and their cost compared to that of a laptop or desktop PC. Norbrook and Scott (2003) who studied motivation in mobile foreign language learning with mobile devices add immediacy to this list; immediate feedback has long been known to be immensely supportive of learning.

The ubiquity of mobile devices is also important: learners, whether young children, teenagers or university students, are accustomed to seeing and using camera phones and handheld games devices. Tan and Lieu (2004) found that elementary school Taiwanese children were keen to use and successful at using multimedia activities on PDAs to learn English. Ogata and Yano (2004) found Japanese high school students using a context based tutorial system on PDAs that helped them choose the correct polite language expressions wanted to continue, even though they did not find the device initially easy to use. In their two previous investigations of PDA use by university student teachers, Wishart, Ramsden and McFarlane (2005; 2007) found more volunteers than there were PDAs available with no-one, student or teacher, being nervous of using a handheld device.

However, as Chinnery (2006) also points out, there are related challenges to successful use. For today's generation of PDAs, their portability results in reduced screen sizes, limited audiovisual quality, a restrictive keyboard for data entry, the need to use SD cards to provide extra memory and a limited battery life. Kukulka-Hulme (2005b) delves more deeply into usability issues however; there is evidence that, despite these challenges, PDAs are of use to teachers. For instance, the Becta project, *Handhelds in Schools*, (Perry, 2003) reported a recognition of the real value of handheld computing devices for teachers in English schools. Their most positive indicator showed that PDAs offer considerable potential to make teachers' management and presentation of information more efficient.

This bodes well for potential to support initial teacher trainees in information management too. In England MFL teacher trainees have to both access multiple information sources during their training year and to travel regularly between placement schools and the university. The information sources they need to access range widely and most are available online. They include documentation on the various UK statutory requirements for schools, the National Curriculum itself and resources to supplement their subject knowledge as well as the documentation associated with being on an initial teacher education course such as timetables, assessment guidance, pupil mark books and lesson observation proformas. Having a handheld Pocket PC running an internet browser designed for PDA use and Pocket Office on hand to enable the student teacher manage this information load sounds very promising. In 2002, Figg and Burson reported

that they found pre-service teachers in the USA were impressed by the capability of handheld PDAs to collect data and resources, together with the ease with which that information could be shared with others, either through printing or by beaming files to others to use. Their pre-service teachers also viewed the capability of the handhelds to provide word processing, editing, and beaming functions as supporting the majority of their learning needs. Other PDA functions that were anticipated, from previous work with science teacher trainees (Wishart et al 2005; 2007), to have potential for MFL teacher trainees included making audio recordings to support development of linguistic skills and taking photographs and video recordings to both reinforce pupil learning and provide evidence of the trainees' progress.

But what about the environment in which the trainees learn to teach? A central aspect of socio-cultural theory (Vygotsky, 1978, Wertsch, 1998) is the claim that all human action is mediated by tools. These tools fall into four groups: technologies and artefacts such as the PDA or a desktop computer; semiotic systems such as language including both words and diagrams; social interactions such as those between teacher trainee and class or student and teacher and institutional structures such as school rules and policies.

Within this context the idea of 'person-acting-with-mediational-means' (Wertsch, 1991) both implies expanded capability for the initial teacher trainee through having the PDA and also suggests that their situated and mediated actions will be constrained by their social and cultural context.

This was clearly shown in our early study with 14 science student teachers (Wishart et al, 2005). The investigation demonstrated the feasibility of PDA use, including web browsing of information sources, by teacher trainees. However, the level of use appeared to be governed by four main factors: the socio-cultural context of the school environment; the pressure of work on a one year initial teacher training course; other hardware availability, and certain key applications.

For the science student teachers who used the PDAs only intermittently throughout the year, the socio-cultural context of being a student in a school had observable impact on their PDA use. Whilst recognising that having Internet access on the PDA extended their capability to answer questions and plan lessons, and having Word enhanced their recording of their observations for later assignments, they tended to feel uncomfortable about using the PDA in class or about asking the school to resolve hardware issues. For these students, personal use of the PDA appeared to support their intermittent use of it for their training programme, the Post Graduate Certificate in Education (PGCE). Where students could see that the PDA applications were personally relevant they continued to use the Internet and Word in particular to support their teaching and learning. Key personal applications included using the PDA as an alarm clock, as a remote control, for SMS (text) messaging and MSN, taking pictures of significant events, online shopping, checking bank balances and having information such as recipes and maps from the web on hand when needed.

This earlier study (Wishart et al, 2005) also identified issues arising from the hardware, with the teacher trainees finding Windows Pocket PC based PDAs easier to use than the Palm OS based ones. The preferred PDAs were kept for the current study which aims to investigate whether the four factors described above were common to teacher training for other subjects. Modern Foreign Languages was selected as the subject to receive the PDAs as the potential roles in language teaching for on-the-spot

audio or video recording were considered to be particularly worth investigating. The students also had the opportunity to download one of the many free phrasebooks to support them in using their target language.

2 Method

Seven PDAs were available for this investigation; they were allocated to those teacher trainees from the PGCE cohort of 37 who volunteered to join the study on a first come first served basis. Announced criteria for joining the study were access to a home PC or laptop to synchronise the PDA with, and a willingness to explore new technologies. A PDA is synchronised with a home PC or laptop to transfer files (especially large ones), to back up diary appointments, documents and images and to install new software onto it. The student teachers received either a Qtek 2020i or an XDA Iii (identical clones unlocked from their original mobile phone networks) running Pocket PC 2003. These PDAs are Windows based devices aimed at providing Microsoft Office functionality on a pocket sized device. They have a 3.5" screen showing 240 x 320 pixels and can deliver web browsing via wi-fi for the internet and email, together with word processing, spreadsheet management and video/audio recording. They can also be used as somewhat bulky mobile phones, though mobile phone connectivity via GPRS was not paid for in this study. The students were informed that they could insert their own SIM cards into the PDA if they wished to use it as a phone. Separate collapsible keyboards were also provided as the PDAs have only the pop-up on screen keyboard.

The seven volunteers were invited to a hands-on workshop where they were introduced to the PDA functions and informed that PDAs have the potential to support them in:

- accessing course documentation (downloaded to the PDA);
- accessing the course Virtual Learning Environment (Blackboard) discussion groups and email;
- just in time acquisition of knowledge from the web;
- finding definitions and translations in e-phrase books and e-dictionaries;
- organising commitments, lesson plans and timetables;
- recording pupil attendance and grades;
- audio or video recording themselves or pupils speaking in a target language and playing these back to individuals or the whole class;
- photographing resources for teaching and reinforcing pupil knowledge, and
- recording lesson evaluations and other reflections on their teaching as audio or text.

During the workshop the students were given an hour's basic training on the devices, the operator's instruction manuals and outline documentation on how to perform the above functions. They were asked to trial as many of the functions listed above as they felt able to during their PGCE year, and were informed that further technical support was available on request.

The study followed a phenomenological approach with a particular focus on using qualitative methods to identify the students' perceptions of the technology and its affordances. The student teachers became participant researchers in the project. Focus

groups were organised for the end of each of their two blocks of teaching practice during the year in order to collect impressions and share potential uses of the PDAs face to face. Lastly, they were individually interviewed in detail at the end of their teacher training course about their use of Information and Communications Technology (ICT), mobile devices and the PDAs to support teaching and learning to teach.

During the final interview semi-structured techniques were used, with the questions targeting firstly background information about the teacher trainee with particular reference to their views on themselves as an ICT user, then their use of the different PDA applications and the tasks they carried out. These were followed by more open-ended questions seeking the trainees' perceptions on the usefulness of the devices and teasing out any issues arising or barriers to PDA use. The complete interviews were then transcribed verbatim and the student teachers' answers collated. Thematic content analysis, where a theme is identified as something important about the data in relation to the research question (Braun & Clarke, 2006), was used to analyse the answers to the open questions. Braun and Clarke (*ibid*) themselves suggest that themes do not have to be prevalent to be crucial; however, it was decided to report only on themes that were common to two or more participants.

3 Results

The teacher trainees were clearly experienced ICT users, with access to computers at home and in school to support their learning and teaching. The following results are drawn from the final interviews that took place during or immediately following their last week on the course. Table 1 shows the range of ICTs used most regularly by the student teachers. Initially most of the student teachers willingly explored a range of functions on the PDA. These are shown in Table 2.

There were no reports of any problems that occurred in finding out how to operate, or in actually operating, the PDA that they were loaned. Some difficulties arose with logging on to protected wireless networks like those in schools or at the University. It is interesting to note that the three trainees who consistently used PDAs more than the others all successfully connected to the Internet via wi-fi and used the calendar for diary scheduling.

However, despite the students' willingness to explore the devices, there always seemed to be a preferred alternative technology, either at home or one that had been put in place by the school to support class teaching.

"I have internet access at home and at school, I've never had trouble getting hold of a computer [...] it didn't really seem like a priority really. [...] more needs driven. And if I'd needed to get hold of the internet and it wasn't available at school then the PDA would have been useful."

Trainee L

"when I wanted to use it there was always another device available that served a better purpose."

Trainee D

“if I was taking pictures it would be my mobile phone or my school camera that I would use.”

Trainee F

Examples of school equipment to hand or that which could be booked by the trainees included cassette recorders and digital video cameras.

“I did find that the PDAs don’t last very long. [...] And I just thought you know what, a cassette player from 1985 is as easy.”

Trainee F

“I used the school camcorder to do that, and of course the resolution on the camcorder will be so much greater than using the PDA.”

Trainee D

“I found it quite easy to borrow a video camera from school.”

Trainee V

There were also clear expectations from other staff driving the students’ use of technology.

“I mean when we were recording my mentor would always set up the cassette recorders anyway because it’s force of habit [...]”

Trainee F

“When I did the oral assessment with my class I used just a normal tape recorder, ‘cos that’s the format that the school are used to using and they’ve got tape copiers and things”

Trainee A

Table 1 *Types of ICT used most regularly by teacher trainees*

Student	PC at home	PC in school classroom	PC in school communal room	Mobile Phone + Camera	USB Stick	Laptop carried to & fro	Digital camera or camcorder
A					✓	✓	✓
D	✓		✓	✓			✓
F	✓			✓			
L	✓	✓		✓	✓		✓
S				✓		✓	
V	✓			✓	✓	✓	
K*	✓			✓			

* K withdrew from the study in the Summer term. His information is taken from the earlier focus group discussions.

Table 2 *The range of tasks that the teacher trainees used PDAs for*

	A	D	F	L	S	V	Total (max=6)
Took notes using handwriting recognition	1	1		1	1	1	5
Took photos	1	1		1	1	1	5
Took notes using on screen keyboard	1	1		1	1		4
Took or Wrote Up notes with portable keyboard	1	1	1			1	4
Personal audio- recording		1	1	1	1		4
Used Calendar for diary scheduling		1		1		1	3
Internet via wi-fi		1		1		1	3
Personal video-recording				1	1	1	3
Audio-recording pupils		1		1			2
Games				1		1	2
Creating podcasts		1					1
Video recording pupils		1					1
Attendance and Grades Spreadsheet				1			1
Email via wi-fi						1	1
Transferring pictures from phone to PC						1	1
Personal wake up alarm						1	1
Downloaded music						1	1
Total no. of applications used	4	10	2	10	5	11	

Where alternative technologies that were perceived to be a better fit to purpose were not available, then there were several success stories of PDA use. This student used her PDA everyday throughout the Autumn term and clearly managed to link herself into the school's wireless network

Interviewer: "So could you just describe for me a situation when you might use it, just go through a day"

Student: “Well I quite often used it as an alarm actually or as a kind of backup alarm, because I’m always worried that I’m not going to wake up on time. I probably ... I might have got it out just on the bus when I was using the diary obviously just to kind of have a look and see if there was anything I needed to be doing. And then I generally used it to type something, the times when there was an essay due in. Read my emails ...”

Interviewer: “So was that in school?”

Student: “Yeah in school. But when I was back at home obviously I just ... I would use my computer.”

Interviewer: “So you used it at school both to check email and because you had it out and it was in your mind, you started typing and used it for some Educational and Professional Studies essays?”

Student: “Yeah. But I think that was actually really useful to have it because there wasn’t a computer really that I could go and use in the school, so it just saved me a lot of time when I was at home really.”

Trainee V

And where the PDAs really did come into their own was for capturing on-the-spot events when pre-booked equipment was not available.

“I used it [...] my G&T¹ event where I wanted to record students role-playing a situation and I didn’t have the camcorder. And I [...] recorded it [...] the sound wasn’t bad”

Trainee D

“I think in a way it was a bit more informal [...] for example I did sort of try doing some audio clips of oral presentations and I think it was a bit more informal than sort of you know getting the tape and pressing play and ... so I think that was quite good in a way.”

Trainee L

“That’s where [...] where I think it is useful. If you haven’t got a camcorder, you haven’t got microphones, you’re not in a computer suite, then [...] being able to hold it up and instantly record is useful.”

Trainee D

Several of the students however would have preferred to use their mobile phones for capturing class events. For example, the teacher trainee who withdrew from the study was particularly disappointed with the PDA’s functionality in comparison to his own

1. Gifted and talented – schools in England are required to provide special programmes for able pupils

Smartphone. They could both be used for scheduling, note taking, email and video; however, the camera on his own phone had much better resolution and picture quality.

Other students reported similar frustrations. Being involved in the study had engaged them in thinking about ways in which using the PDAs or their own personal mobile phones for video or audio capture of their classes could support their teaching, but they were overwhelmed by schools' bans on pupils' use of mobile phones. This student illustrates his dilemma:

“phones were being used in school in class sometimes and then half way through the term they introduced a new rule that phones were not to be used [...] and if they were seen in lessons they would be confiscated by the teacher [...] So I thought [...] with that regulation coming in, for me to get my phone out, there would have been a bit of uproar [...] so I just thought best not to.

Trainee D

The PDA itself was also viewed as potentially disruptive technology which was perhaps justified for this student who was concerned to observe a more experienced teacher discreetly.

Interviewer: “but you didn't take notes on the PDA for those observations?”

Student: “I think I might have done once. But I kind of felt it took ... the kids were all staring at it and going ‘Oh what's that?’ and I thought it was creating a bit ...”

Trainee V

Over the academic year it became apparent that the perceived discomfort of going against the established culture and practice for a teacher in training in a secondary school environment, combined with the pressure of work on a one year initial teacher training programme, led to a drop in the use of the PDAs.

“I suppose it's just ... I had other things to do, other things on my mind.”

Trainee D

“I think later in the course I just thought I can't do this, I can't use that on the top of everything else. I don't know if it was the enormity of PGCE and whether in two or three years' time when you're used to teaching you would be able to use it”

Trainee F

Nor did any of the group take the opportunity to download any language specific support material for the PDA such as free e-dictionaries or phrasebooks. As specialist linguists they did not really feel that they needed this level of support, though this last student recognises that they may have missed an opportunity. Some schools today (there are three in Bristol) are beginning to issue staff and pupils with handheld devices.

“Because the PGCE, I think it just took me all my life, and I thought the most

important thing would be maybe my assignments and my lesson plans rather than trying things with the PDA. But it's a shame because I know that ... there's a PGCE student who ... his school uses it"

Trainee S

Another student reflecting on the project focused on how the group of MFL teacher trainees had approached the task. She compared her and her colleagues' use of the PDAs with the way she believed teacher trainees in other subjects worked and clearly linked a 'will to explore' rather than a 'wish to be told how' to effective use of new technologies.

Student: "And I think if you look at the use of IT in MFL, although we're very competent at certain areas a lot of us need the idiot's guide ... to put it bluntly ... on how to do it. Whereas I think when I've spoken to my friends who do science, maths and even humanities ... seemed to use ICT much more readily and easily ..."

Interviewer: "Exploratively I think I'm getting from what you're saying."

Student: "Yeah. I think that's part of it"

Trainee F

And finally, this student sums up the group's perspective neatly.

"I mean if the PDA took better photographs [...] then I could have left my camera and my laptop at home and just had the PDA. But it didn't quite do enough and [...] I think I didn't have the time to get quick enough at using it either to leave everything else at home."

Trainee A

4 Discussion

Use of the PDAs was found to be less frequent than had been anticipated. Whilst the student teachers recognised that the handheld devices had potential to support them in their subject teaching, they tended to be unwilling to spend time on the necessary exploration to put this potential into practice. The schools where the trainees were placed had established practices in employing ICT to support MFL teaching and the resulting socio-cultural context and expectations had even more impact on the MFL student teachers than had been the case for the science trainees in Wishart et al's (2005) original study.

Additionally, the PGCE programme the students were following is an intensive one year teacher training programme that allowed only a little time for exploration but even so, compared to the science teacher trainees, the MFL students were less venturesome. For instance, none of the students felt up to contacting technical support in school to arrange for the synchronisation software to be installed on the classroom computer. This would have enabled them to play back any of the images or audio they had recorded on their PDA to the whole class.

This study shows two factors that clearly mediate the use of handheld devices in the UK MFL classroom: expectations of the subject culture on technology use in teaching

and the presence of readily available alternative technologies. With respect to the former, John and Baggott la Velle (2004) point out that teaching and learning in classrooms are influenced by a number of variables that include beliefs about subject matter and subject traditions, as well as a variety of personal theories and related pedagogical styles. These form subject subcultures which find expression in the prospective and retrospective pedagogical identities of teachers and define the ways in which the challenges of ICT are perceived. Trainee teachers have not yet formed clear pedagogical identities, making them more vulnerable than established teachers to pressures to conform to observed classroom practices rather than trying out new technologies.

The MFL trainee who compared the way she and her colleagues went about developing their use of ICT in teaching to the way she envisaged science teacher trainees did showed good insight into the influence of subject subculture. For, as John and Baggot la Velle (2004) point out, science has a long association with new technologies and as a discipline was responsible for many of the changes in methodology and practice that were brought about by, for example, the liberating effect of computing power. This may well be a factor in her views that scientists had the necessary 'will to' or even 'license to explore' rather than her 'wish to be told how' to make effective use of new technologies.

The second factor; the availability of alternative technologies is interesting. It has long been known that perceived availability is central to teachers' decisions about whether to use technology or not (Cox, 1999), yet the most readily available technology should have been the PDA in the trainee teacher's pocket or handbag. In fact, where success stories of PDA use were reported, it was because the PDA was to hand and could be used more quickly than going to find the department's digital video camera or more informally than setting up a cassette tape recorder. However, it was much more likely that, with the strong emphasis on planning for teaching in their course, the student teacher had planned the lesson well ahead and booked the traditional resources. Thus, ensuring that these alternatives are readily available is clearly a more successful strategy for technology mediated language teaching within the current MFL classroom than giving the teacher a PDA. However, the number of schools where whole classes have access to PDAs, such as those participating in the Wolverhampton Learning2Go and the Bristol HandeLearning projects, is rising. Teacher training institutions need to prepare their students for these developments.

This study also highlights but cannot resolve the issues of deploying mobile phones in the classroom. This is currently a thorny topic for MFL teachers who, on the one hand, see successful results from studies on, say, teaching English in Japan where mobile phones are more pervasive. These include Thornton and Houser (2005) on using SMS quizzes and revision exercises and Taylor and Gitsaki (2003) on using mobile phone browsers to access web sites in the target language. Both these investigations show that teachers can successfully deploy mobile phones to provide a genuine context for the development of a foreign language. Yet, on the other hand, in England, gadget manufacturers are now visibly marketing cell phone detectors for use in schools to help staff seek out banned devices. If MFL teachers are to be enabled to use handheld technologies such as PDAs, mobile phones and MP3 players in their teaching, then schools need to endorse a whole-school approach to developing a culture where students use new technologies responsibly and safely.

5 Conclusions and recommendations

This investigation into potential uses of a PDA to support student teachers of MFL in their learning and teaching is clearly limited in size and scope and thus the results may not be automatically generalisable to other pre-service teacher training programmes. However, the finding that the aims of the investigation were overwhelmed by the socio-cultural context of the trainees' classrooms, where they did not feel comfortable about exploring PDA functionality, was not anticipated and needs to be noted for future research. Whilst established teachers look for new ideas from new trainees and, in principle, accept the theory of trialling new devices to support teaching and learning; the participants still felt they could not disrupt established practice with the novel technology.

However, when the devices were used, the applications that were reported as best supporting learning to teach MFL with PDAs were those that enabled capturing 'on-the-spot' events and reflections. This occurred either through the inbuilt recording of audio and video, or by making notes using the stylus with handwriting recognition software. Thus, information was recorded as and when events occurred and could later be used for the reflective essays required by the teacher trainees' taught programme. Examples reported included use of video to stimulate recall of an event and text notes that were built into an assignment. However, in order to be useful to a trainee teacher, a handheld device must have the ability to capture good quality audio and video. The student teachers found the 1.3 megapixel camera found in the PDAs used in this study to be of insufficient quality and did not persist with their investigations of the use of video.

In retrospect, technical support for trainees needed to be offered more proactively instead of 'on request', especially for connecting personal devices with school systems. It may well be that the student teachers were reluctant to display a lack of competence and were putting forward other, more socially acceptable, reasons for not using the device, such as lack of time or an unsupportive school culture.

Lastly, in the current climate personal ownership of internet enabled PDAs, whether wireless or mobile phone, is on the increase. The personal computer and mobile phone are merging with the PDA on one side and the Smartphone on the other. In this small study involving seven student teachers, two owned Smartphones and four more had personal mobile phones with inbuilt video cameras. With technical and practical support, such devices can clearly be deployed to support the teaching and learning of modern foreign languages. However, this investigation exemplifies the socio-cultural context found in many schools in England today that militates against the development of new teaching strategies using handheld devices. Schools need to reconsider their position in order to enable a climate where mobile phones or PDAs can be used by MFL and other subject teachers for teaching. It is recommended that this be a whole-school initiative including pastoral work with pupils covering responsible use of handheld devices rather than confined to the languages department.

References

- Beatty, K. (2003) *Teaching and Researching: Computer-assisted Language Learning* (Applied Linguistics in Action) London: Longman
- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in*

- Psychology*, **3**(2): 77-101
- Chinnery, G.M. (2006) EMERGING TECHNOLOGIES Going to the MALL: Mobile Assisted Language Learning. *Language Learning & Technology*, **10** (1): 9-16. <http://llt.msu.edu/vol10num1/emerging/default.html>
- Cox, M. (1999) What Factors Support or Prevent Teachers from Using ICT in their Classrooms? Paper presented at the *British Educational Research Association Conference*, University of Brighton, Sussex, September 1999.
- Figg, C. and Burson, J. (2002) PDA strategies for preservice teacher technology training. In: Barker, P. and Rebelsky, S. (eds.) *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2002*. Chesapeake, VA: AACE, 507-509.
- John, P. and Baggott la Velle, L. (2004) Devices and Desires: subject subcultures, pedagogical identity and the challenge of information and communications technology. *Technology, Pedagogy & Education*, **13** (3): 307-327.
- Kukulka-Hulme, A. (2005a) The mobile language learner – now and in the future. Fran Vision till Praktik. Language Learning Symposium, Umea University, Sweden. <http://www2.humlab.umu.se/symposium2005/program.htm>
- Kukulka-Hulme, A. (2005b) Mobile usability and user experience. In: Kukulka-Hulme, A and Traxler, J. (eds.) *Mobile Learning: A Handbook for Educators and Trainers*. London: Routledge Falmer, 45-56.
- Norbrook, H. and Scott, P. (2003) Motivation in mobile modern foreign language learning. *Paper presented at MLEARN 2003: learning with mobile devices*. London, May 2003.
- Ogata, H. and Yano, Y. (2004) Context-Aware Support for Computer-Supported Ubiquitous Learning. In: *Proceedings of the The 2nd IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE'04)*. http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1281330
- Perry, D. (2003) Handheld Computers PDAs in Schools. Coventry: British Educational Communications and Technology Agency. <http://publications.becta.org.uk/download.cfm?resID=25833>
- Tan, T. and Liu, T. (2004) The mobile-based interactive learning environment (MOBILE) and a case study for assisting elementary school English learning. In: *Proceedings of the IEEE International Conference on Advanced Learning Technologies (ICALT'04)*. http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1357471
- Taylor, R. P. and Gitsaki, C. (2003) Teaching WELL in a Computerless Classroom. *Computer Assisted Language Learning*, **16** (4): 275 – 294.
- Thornton, P. and Houser, C. (2005) Using mobile phones in English Education in Japan. *Journal of Computer Assisted Learning*, **21**: 217-228.
- Vygotsky, L.S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, Massachusetts: Harvard University Press.
- Wertsch, J. (1991) *Voices of the Mind; A Sociocultural Approach to Mediated Action*. London: Harvester.
- Wertsch, J. (1998) *Mind as Action*. USA: Oxford University Press Inc.
- Wishart, J., Ramsden, A. and McFarlane, A. (2007) PDAs and Handhelds: ICT at your side and not in your face. *Technology, Pedagogy and Education*, **16**(1): 95-110.
- Wishart, J., Ramsden, A. and McFarlane, A. (2005) Using Personal Digital Assistants (PDAs) with Internet Access to Support Initial Teacher Training in the UK. In: *Proceedings of MLearn 2005*. Cape Town, SA., October 2005.