

iPads in Higher Education

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*Proceedings of the 1st
International Conference
on the Use of iPads in Higher
Education (ihe2014)*

Edited by

Nicos Souleles and Claire Pillar

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PREFACE

This edited volume of papers presented at 'ihe2014' (1st international conference on the use of iPads in Higher Education) aims to contribute empirical research in an area where there is an obvious need for further academic study. Although the iPad computer tablet is increasingly adopted across many universities worldwide, there remains a noticeable gap in the literature on the instructional potential of this tablet in different academic disciplines. In addition, what is called for is a critical examination from the perspective of different research methods, to unpack the potential contribution as well as limitations of the iPad for teaching and learning. In this respect, the mission of this volume is to address these challenges and – to use a well-known idiom – get the ball rolling.

Subsequently, this volume of conference proceedings is of interest to a wide range of people, including academics from different disciplines who are implementing mobile learning and learning with iPads, instructional designers and instructional technologists who provide support for such implementations, researchers who want to be informed on the different applications of this tablet in the sector, as well as academics in general who wish to explore the potential of the iPad for teaching and learning.

These proceedings cover the following academic disciplines: Urban Planning and Management, Urban Studies, Education, Environmental Management, Biology, Medical Education, Master of Business Administration, Teacher Training and Education, Physics, Languages, Field Work, Conference and Meetings Management, Hospitality, Art and Design, Computing and Mathematics and Physiotherapy and Occupational Therapy. In addition, the articles make use of a wide variety of research methods, such as: Surveys, Questionnaires, Focus Groups, Long-Term Studies, Qualitative methods, Pilot Projects, Multimodal Approaches, Observations, Use of Technology Implementation Models, Action Research, Ethnography, Field Studies, Document Collection and Analysis, Content Analysis, Case Studies, and Mixed Methods. What these articles share in common is a critical reflection on the instructional potential of iPads for teaching and learning.

Lastly, the editors acknowledge the significant contributions of Dr. Fernando Loizides, Dr. Salomi Papadima, and the doctoral students Stephania Savva, Antigoni Parmaxi and Dimitra Perdiou. We also wish to

thank the reviewers of the conference papers: Dr. Andri Ioannou (Cyprus University of Technology), Dr. Jane Costello (University of Newfoundland), Dr. Fernando Loizides (Cyprus University of Technology), Dr. Marguerite Koole (Athabasca University), Prof. Tony Shannon (Karl Von Busse Institute of Design) and Dr. Nathaniel Ostashewski (Curtin University).

On behalf of the ihe steering committee

Dr. Nicos Souleles
Claire Pillar

www.ipadsinhe.org

USING iPADS AS A DYNAMIC LEARNING TOOL TO DEVELOP SKILLS IN GRAPHIC COMMUNICATION AND ENHANCE SPATIAL AWARENESS

ELISABETE CIDRE¹

Abstract

This paper will present interim reflections on an ongoing pilot educational project being undertaken with the 2013-2014 new undergraduate cohort of Planning students in the three existing programmes at the Bartlett School of Planning (BSP) in University College London (UCL): Urban Planning, Design and Management (UPDM), Planning and Real Estate (PRE) and Urban Studies (US). The main purpose of this project is to enhance the University-level agenda for key transferable skill development (academic, self-management, inter-personal, but most importantly, communication) via active production of design (e)artefacts of paramount value for employability in the Built Environment – the iportfolio. It also aims to contribute to wider pedagogical and theoretical debates on the nature and value of the use of technology in Built Environment higher education. The project is developed in two stages, over the academic year. During terms 1 and 2 (October-December and January-March), the project will pilot the use of iPads as a dynamic learning tool in graphic communication, and will explore the potential of technology-enabled features and utilities to improve student engagement and foster individual learning. In terms 2 and 3 (April - June), the project will pilot the use of iBooks as a dynamic learning resource in phenomenological pedagogy, with the aim of building on the capacity for our graduates to become reflective practitioners. It will do so by promoting the co-development of iportfolios as design (e)artefacts that enable and reinforce the values of self-regulated and flexible learning and ongoing personal/career development.

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1. Rationale of the Project

The use of technology is definitely changing the ways we teach, learn and practise in the creative built environment disciplines. This calls for the use of e-resources, features, utilities and tools to be embedded within experiential and iterative learning methods, as no doubt the use of technology will appeal to a contemporary and young cohort, one which has e-mastery embedded in the way it communicates, learns and socialises. Undergraduate Year 1 Planning students often have no prior design or studio experience, and are for the first time being asked to develop a language of design that enables them to communicate design ideas. This is an iterative learning process, highly based on exploratory approaches rooted on constructivist and experiential theories of learning (Dewey, 1938; Savery & Duffy, 1996). These contend that enhanced understanding is achieved through engagement with others, i.e. “social interactions as pedagogy” (Shaffer, 2007), discovery and personal experience.

This project aims to bring a fresh look at the use of technology in experiential learning methods by using the iPad as a dynamic learning tool and the iBook as a dynamic learning resource. Within the Faculty of the Built Environment (where BSP sits), it will be an innovative mechanism for staff and students to explore within the creative learning environment. The use of technology will appeal to students to articulate their learning experiences and creativity, whereby they will be encouraged and nurtured to produce their own iBooks to showcase their own (design) work. By doing so they will be iteratively developing their e-portfolio as a design artefact. The project is being embedded in the curriculum over Terms 1 and 2 alongside the modules where communication ability and spatial awareness are developed - Graphic Skills (Term 1) and Urban Design Skills (Term 2).

In the weekly module “Urban Lab I: Graphic Skills” (October-December) students learn different methods and techniques of graphically presenting urban analysis and archival research. In this module students work in groups and in pairs, combining the “traditional” use of sketching, figure-ground study, technical drawing, mapping and layout techniques, and, for the first time, using the digital possibilities (apps) enabled by the iPad (i.e. Adobe Ideas, Adobe Photoshop, etc.). Students were given sketchbooks and iPads and encouraged to use the iPad as a dynamic and interactive learning tool to help them develop their skills in graphic communication and enhance their spatial awareness, two key objectives for the development of conceptual built environment knowledge and literacy. Using iPads is also allowing the students to develop their group

projects in a more dynamic (e)community, as by using the Adobe Creative Cloud suite of resources, they can create and develop content simultaneously, as well as share, access and publish it whether in the class or offsite, automatically syncing different users in different locations.

Interim evaluation of the project will be conducted via a survey questionnaire and focus groups, where students will reflect on their elearning experience over the taught 10 weeks. The cohort of 61 students will complete a survey in the last taught session of term 1 (to ensure a high response rate), where a combination of “multiple-choice” and “attitude battery” questions will be used. The “attitude battery” format is useful to measure strength of opinion from respondents (i.e. how useful was the use of the iPad in this module), where a scale of five (5) points is provided (ranging from bad to excellent, daily use to do not use, etc.). Five points are chosen as this is considered the optimum number for an attitude battery questionnaire, with respondents losing the ability to differentiate with more points (McLafferty, 2003). Open-ended sub-questions will also be used (why/why not?) to allow a broader scope of data, and more meaningful responses to be collated, which will help devise the themes for discussion in the focus groups.

The focus groups will run at the beginning of term 2, in an informal and sociable setting, while on a field trip abroad to a European city. The focus groups will consider how the project can be explored further during Term 2 when the iPads will be used for their group and individual work in the bi-weekly module “Introducing Urban Design: Urban Design Skills” (January-March), in conjunction with e-resources created in partnership with the 2012-13 cohort: the Urban Design Images group resources, available via the MyPortfolio and Moodle VLEs (Virtual Learning Environments).

The Urban Design Images group displays still images that provide a reference image library of six spatial categories (experiential and behavioural qualities, hard vs. soft materials, leftover space, street furniture, townscape, urban fabric). Each category has its own folder and these are compiled in a page, the Images Archive. In addition, the webpage Urban Design in the Web provides a synopsis and links of urban design-related web projects and resources. New features are currently being developed by the tutors (funded by UCL ELDG, between June-December 2013) to add to the experiential and behavioural qualities category, identified by the students as “challenging and contentious and more open to subjective interpretation”. By exploring these qualities in more depth while developing their projects, we aim to develop an iBook of Experiential and Behavioral Qualities of Space, in a collaborative

partnership of staff and students, throughout term 2. This interactive textbook (of text, evolving illustrations, image and sound narratives [filmed using iPads], quizzes) aims to enhance the understanding of not only spatial but also phenomenological awareness, “shorten[ing] the road to self-experience” (Findeli, 1990).

The iBook is seen here as a useful Open Educational Resource (OER) “openly available for use by educators and students, without an accompanying need to pay royalties or licence fees” (Butcher, 2011). The iBooks’ content and all of the interactive features can be easily accessible in any Apple device as the iBook app can be downloaded for free from the app Store. A lite version can also be created for access in Android devices as a PDF file. The use of mobile devices (iPads) in the learning of graphic communication and urban design skills and development of an enhanced spatial awareness will ultimately seek to encourage undergraduate students to take an active role in the iterative production of (their) design (e)artefacts by producing their own e-portfolio(s) as an iBook. As such, students will be invited to an extra-curricular workshop on “how to do your own iBook”. By using and developing their own iBook(s) students will be building their own employability skills through flexible online learning.

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IPADAGOGY: IPADS AS DRIVERS OF TRANSFORMING PRACTICE IN TEACHING EDUCATION

PAUL HOPKINS¹ AND KEVIN BURDEN²

Abstract

The tablet computer (iPad) offers a range of affordances to the teacher and learner in higher education, including mobility, social interactivity and customisation (Kearney, Schuck, Burden & Aubusson, 2012), and the standards (standard 3) for trainee teachers in England require that teachers “successfully identify and exploit opportunities to develop learners’ skills, in communication, reading and writing” (DfE, 2013). This project is exploring the broader professional learning of teachers, occurring within the university and on vocational placement and in the students’ homes. Using a mainly qualitative approach of student logs and questionnaires and interviews with both tutors and students, it is looking at how the presence of such technologies in the hands of an entire course cohort affects the nature of learning and teaching, including the move towards an inquiry-based rather than a delivery model. The data will be analysed using an inductive thematic coding method. In addition, the project seeks to explore the wider institutional impact of mobile technologies for learning and teaching purposes, including the pedagogical and logistical consideration across and beyond the institution.

1. Introduction and Literature Review

With the growth in ubiquitous ICT and the emerging use of mobile technologies in and outside of the classroom it is becoming increasingly important to prepare trainee teachers to use and harness flexible technologies, such as mobile and tablet devices, both for their professional

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and personal learning (Aubusson, Schuck & Burden, 2009). The use of mobile technologies in teachers' own professional learning offers the potential for teachers to access current educational information (e.g. video clips, articles, lecture and presentation notes), and transfer valuable learning and teaching resources between their various bases, which include the university itself, their school placements and their homes (Wishart, 2009; Aubusson et al., 2009). In addition, it offers opportunities for students to collaborate with other students (and teachers) and to analyse and reflect on their own practice and learning. Many of these are generic employability skills which are valued across many different cognate areas of the university and are therefore of interest to many different stakeholders beyond the Faculty of Education where this project is rooted.

In a rapidly changing world, teacher professional learning needs to provide opportunities for critical reflection and access to changing knowledge bases; mobile technologies offer a potentially powerful means to enhance teachers' professional learning through:

- The discussion of pedagogical issues within a community of colleagues and with other trainees, both within and beyond the institution;
- Ready access to online information and resources;
- Shared reflection on digitally captured classroom experiences.

Although some authors have identified mobile learning as a possible way of alleviating some of the problems associated with the itinerant nature of teacher training (Aubusson et al., 2009; Wishart, 2009), Wishart, McFarlane and Ramsden (2005) also discovered that trainee teachers appreciated the portability that mobile devices afforded for transferring resources, and especially the just-in-time access to the Internet made available through the device. Trainees and teachers in this study found the mobile device particularly useful for management activities such as record keeping and note taking. This project sought to build on this research, using a more enhanced mobile device (the iPad), to extend our understanding of the ways in which the latest technologies might enhance current provision in Initial Teacher Education (ITE), supporting new forms of pedagogy and learning, especially that of inquiry-based learning (Justice, Warry, Cuneo, Inglis, Miller, Rice & Miller, 2001), both within the institution and during the periods of time when students are working outside the university on teaching placements. This is integrated with a new approach to learning using an inquiry-based learning model, which is facilitated by the 1-1 affordance of the mobile device.

In spite of the potential benefits that mobile technologies might bring to Inquiry-Based Learning (IBL), there remains a rather limited body of

research on teacher learning with mobile technologies. Much of the current research investigates the integration of ICT into school curricula (Bain, 2004; Staples, Pugach & Himes, 2005). Whilst there have been some small-scale projects, which have explored the use of mobile technologies in ITE (Wishart, 2009), these have not tracked trainee teachers through their school placements nor have they investigated the impact of access to such technology after the students leave the institution when they find employment as teachers.

Also, research on mobile technologies in education has tended to focus primarily on use by pupils, and on the ways that teachers can support that usage, whilst very little research has been conducted on how teachers and trainee teachers themselves might learn with these new technologies, or indeed with any digital technologies (Naismith et al., 2004; Fisher, Higgins & Loveless, 2006). Further, as third generation mobile technologies, which offer increased connectivity, are a relatively new phenomenon, there has been little opportunity to assess the impact of these next generation technologies for professional learning. Fisher et al. (2006) argue that if different approaches to learning and teaching, and different relationships between students and teachers are to occur, it is essential to understand teachers' learning and the role that digital technologies might play in this. This project sought to build on the review by Fisher et al. (2006) of teacher learning with digital technologies by considering what mobility, with its characteristics of being personal and portable, might contribute to the experience of trainee and early career teachers, and what benefits this might ultimately bring to institutions involved in the process such as the university provider and the recipient schools.

2. Post-PC Technologies for Professional Learning

In recent years there has been a discernable shift in education away from fixed personal computers towards more pervasive devices (sometimes referred to as "Post-PC Technologies") such as mobile phones and tablet computers, which are highly personal, rather than corporate, technologies. Although mobile phones have been around for almost a decade it is only in recent years that they have become virtually universal, with UNESCO estimating there are around six billion subscriptions across the world (UNESCO, 2012). Their use as tools for learning, however, especially in formal contexts such as schools and universities, remains contentious and largely unexplored, both for practitioners and policy makers alike, who face the dilemma of reconciling the potential gains of these devices with the much publicised dangers and concerns, real or

perceived, when used in the classroom or lecture theatre. More recently students are beginning to purchase and bring to the campus their own mobile computers, including laptops, notebooks and tablet technologies. There remains, however, an urgent need to clarify how such portable technologies can be used most effectively for teaching and with what impact:

While the field is expanding, crucial issues underpinning practices and their sustainability remain to be addressed such as the role of teachers and the type of professional development required to prepare them for teaching their students to learn with these devices... (Ng, 2013, p. 2)

In the Faculty of Education at the University of Hull there is a more pressing need to understand the phenomenon of mobile learning better (m-Learning), since many of our students embarking on professional programmes such as teaching are likely to encounter situations in their work placements (post primary schools) where these technologies are being used by teachers and students alike. This is likely to be common across many other professional contexts and disciplines, especially where students experience a prolonged period of teaching or study in a work-based environment, such as healthcare, medicine, dentistry and some aspects of logistics. Hence the need to support students in their use of these emerging technologies, from both a personal and professional perspective, is common to a wide range of cognate areas and disciplines across the university sector and particularly the University of Hull.

The university therefore funded a two-year project embedded in the Faculty of Education to support the development of trainee secondary teachers when using personalised tablet computers. The faculty purchased 150 second-generation iPads (iPad 2s), which were allocated to all students starting in September 2013. The devices were supplied with a core set of applications. These were decided in consultation with the tutors and drawing on the project leaders' experience from other projects in the UK, and their use and impact will be monitored and evaluated by staff from within the Faculty over the course of the academic year of study for the cohort (2013-2014) and then repeated for the following cohort (2014-2015). The devices will be collected back from students at the end of their programme in June 2014, and will be reallocated to the second cohort of students the September of that year. It is anticipated that many of the lessons gathered and learned in the first year of the programme will be incorporated into a more expansive provision starting in year two. The first year can, in some ways, be considered an extensive pilot programme.

Based on previous evaluations and research undertaken by members of the Faculty of Education, it is anticipated this two-year project will generate significant insights into a range of issues associated with the move towards more personalised, individual technologies, such as the iPad, helping to inform our institutional understanding and awareness of how best to support and exploit this trend in terms of learning, teaching and the underlying logistical and infrastructure requirements to make it a reality.

3. Research Design, Aims of the Research

In order to gather, interpret and disseminate this data, staff associated with the project, supported by other colleagues and colleagues across the university, are conducting a two-year evaluation of this project, which will focus on a range of different impacts, including:

- The impact on lecturers and their teaching approaches/styles when all students have access to ubiquitous, connected technology like the iPad, particularly in the delivery of a professional studies curriculum rooted in an inquiry-based learning methodology;
- The technical and logistical infrastructure required to support students in their use of mobile technologies, both on and beyond the university campus (this includes the impact of wide-scale usage of tablet devices on the Wi-Fi infrastructure);
- The impact on students as learners in terms of organisation, metacognition and competence in using technology to support their learning and understanding;
- The extent to which the use of a personalised connected device can assist students and tutors in tackling some of the problems associated with work placement, such as the provision of ongoing support and advice; the sense of isolation experienced by individual students; the dissemination of resources and ideas for students remote from the university.

Hence these potential impacts will form the broad canvas for a two-year evaluation of this project.

4. Research Questions

This study provides a large-scale, in-depth investigation of how the use of a mobile computing device (i.e. the iPad) facilitates a more effective ITE experience for trainees. The overarching research question addressed by this project is therefore: How does the use of mobile

technologies support, enhance and extend the professional learning and practice of trainee teachers and their lecturers/mentors?

4.1 Sub-Questions

1. What aspects of trainees' own professional learning do mobile devices best support? Does this vary according to the subject specialism of the trainee?
2. What is the impact upon lecturers and their teaching approaches when all students have access to an Internet-enabled device, like the iPad?
3. In what ways does the use of mobile technologies support students and their tutors/mentors during teaching placement when students are remote from the university context?
4. What are the logistical issues required to support ubiquitous mobile pedagogies (e.g. technical support; infrastructure issues)?

5. Methodology

The research design aimed to provide a robust and in-depth source of longitudinal data to track the progress of the initiative across two academic years (2013-2015). The research design adopts a mixed methods approach, which includes an interpretative study to explore the views, attitudes and practices of trainee and early career teachers from a personal perspective, along with a qualitative approach to identify changing patterns of use over the academic year. The research seeks to explore and investigate new phenomena in terms of how trainee and early-qualified teachers use, modify and evaluate the use of mobile technologies for their professional learning. In keeping with the research questions outlined above this suggests the adoption of methodologies and research instruments, which are sympathetic to the exploratory nature of the research itself. Rossman (1988) identifies a number of salient features, which underpin the research design we will be using, these being:

- The link between qualitative research approaches and natural settings: our research will be located in relatively natural settings, populated with actual users (teachers and students) undertaking authentic activities and tasks. In addition, the research team will be highly involved in the actual experiences of participants, which also characterises “naturalistic” and interpretative research.

- Qualitative research is emergent rather than tightly pre-figured: this is a crucial consideration for the type of activity we are likely to be engaged in, which will change during the course of the project. This may affect the research questions, as different themes or patterns begin to emerge from the data, which we initially collect. Even the data collection methods are likely to change from those we have outlined below, since this is a novel area of experiences, and it is likely we will discover alternative instruments and approaches as the phenomenon itself becomes clearer.

Qualitative research is fundamentally interpretative: we are exploring a largely new and hitherto unexplored phenomenon, and an interpretative research paradigm is therefore entirely appropriate as it is essentially inductive, rather than deductive, describing the setting, before starting to analyse the data for emerging themes and categories which inform the final interpretation.

The sample includes the entire cohort of trainee teachers who will be training for post-secondary education; in 2013-2014 this amounts to approximately 135 students. These include six subject areas: English, Mathematics, Science (Biology, Chemistry, Physics and Physics with Maths), Modern Foreign Languages (French, German and Spanish) and Geography and History. In order to maintain the ethical integrity of the project, all of the trainee teachers on this course have been invited to participate in the research, and have been offered the opportunity to withdraw if they so wish. At the time of writing (October 2013) none have opted to withdraw from the project, though one student did decline to take part, citing their worries about losing / damaging the device.

In terms of data generation, there are a number of research instruments, which will be used to generate data during the project. These are:

- Online baseline and exit surveys of students to identify changing levels of skill sets and attitudes towards the use of technology;
- Semi-structured interviews of students and lecturing staff conducted by researchers at the end of phase II (November 2013) and phase IV (February 2014);
- Blogs and self generated artifacts produced by students during the course of the year (these will be collected through a Dropbox folder set up for each subject group);
- Regular student reports on their usage;
- Tracking of the applications loaded onto the devices;
- Periodic surveys;
- Video case studies of particular usage.

6. Inquiry-Based Learning

A core function of the iPad is to facilitate a move from a lecture /seminar based model of learning to an IBL model. With students having access to the devices we can be confident that they have access to the materials, which are uploaded onto a website, before the IBL session. Building on the work of Justice et al. (2001), we have developed a suitable model for teacher education students (Hopkins, 2013). An ongoing concern has been how we prepare teacher education students with suitable insights into the theoretical underpinnings of education whilst also allowing them to concretise this into the practice in their school based parts of their training. The use of the devices and the IBL or flipped learning model will allow this. Initial feedback after the first weeks has been very positive from both the students and the tutors delivering this new model as opposed to the lecture and seminar model, which was followed in previous years. There is no doubt in our minds that the iPads have made this methodology possible in a way that would have been almost impossible without the devices – as access to technology both prior to and during the IBL sessions is essential to effective implementation.

7. Initial Data

The initial baseline survey data explored the existing technology base of the students, the ways in which they had experienced technology in learning and teaching and the idea that these were “digital natives”. Not surprisingly, access to technology was high, with especially high ownership of laptops and almost all students having access to mobile devices of some sort. The relatively low ownership of game players might also be surprising.

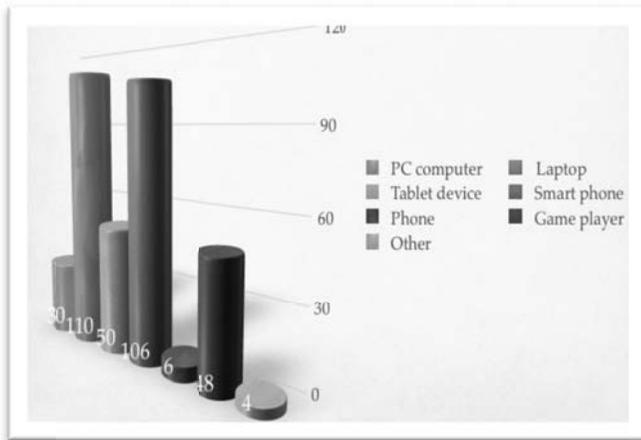


Figure 1. Technology ownership – students September 2013, n=115

When asked how they currently used technology for learning the figures followed similar patterns for the desktop and laptop, but were different for mobile devices. Learning was mostly seen as writing assignments, accessing web sources and using communication such as email.

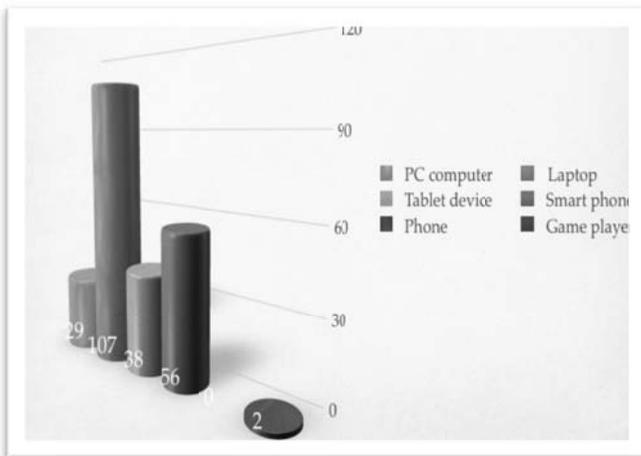


Figure 2. Technology used for learning – students September 2013, n=115

The students were also asked how often, in their undergraduate teaching, they had experienced technology used in the teaching to which they had been exposed.

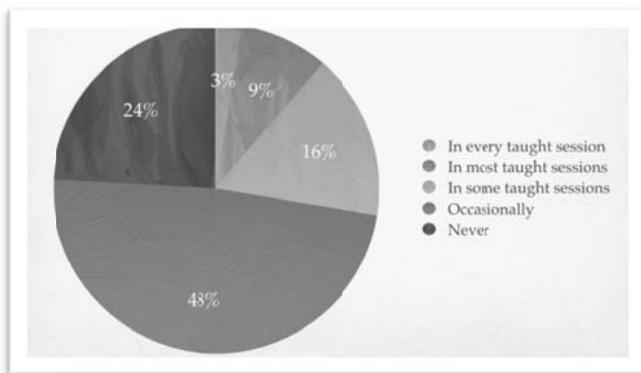


Figure 3. Technology used for teaching – students September 2013, n=115

The experiences of the students were that technology had been used to some degree in about three-quarters of their teaching, but when asked the type of technology this was overwhelmingly uni-directional technology, was mostly projection or presentation technologies, and with very few exceptions was synchronous with the teaching event. Very few of the students have experienced any remote or asynchronous teaching as part of their undergraduate degree.

Initially, the students were asked to keep a Wiki of their own use of the iPads. However, this was found to be technically challenging for many of the students, and so we reverted to the use of emailed reports sent to the researchers. At the time of writing this paper only the first three weeks of this data is available. This amounts to about 200 emails of data, the scope of which ranges from 400-500 word reports showing an analytical and reflective account of usage to a short descriptive comment of use or non-use. Initial analysis can group the comments into four areas:

a) The iPad as a resource access device

Given the nature of the inquiry-based learning and the provision of materials for the students to access before the IBL sessions this was one of the most prevalent reported uses of the device. The use of the device has allowed for the distribution of multimedia resources for students to access including e-books and other e-resources via the library services.

Comments from students include:

“...iPad mainly for... FiPS (professional studies) reading, subject method reading and research within subject method sessions...”

“...Looking at Prezis, to do pre-reading without having to print it out/carry documents around...”

“...Keynote power points during method sessions, research during university based days...”

“...Especially finding it handy for reading downloaded journals...”

“...I have used iBooks and Pages more than any other apps, these have helped with reading and writing.”

“Being able to save various documents in iBooks has proven very useful, and it has certainly saved on paper...”

“...I do love is the podcasts, I have downloaded many to do with history and listen to them on my way into university or school.”

b) Taking notes, organising work and making resources

As well as accessing resources the students have been using the devices in sessions to take notes and to organise their learning, including the use of applications such as Dropbox and Calendar as well as list makers and checklists. Whilst many students are still also using traditional resources such as pen and paper more and more are using the devices to take notes (using a word processor application) to map ideas (using post-it or mind mapping applications) or using the camera to capture shots from groups work or the notes from the tutor's screen.

Comments from students include:

“...Taking notes, creating mind-maps...”

“It has helped my learning in that the resources are to hand without having to print them all out, making organisation much easier...”

“...Used it to make presentations using Keynote and to make notes using pages...”

“...Note taking and pre-reading for class...”

“...To take pictures of the posters we made in FiPS, and to fill in the journal...”

“...I use the iPad to take pictures for inspiration for future planning and resources...”

“I find the iPad very handy to show documents quickly to other people and share information...”

“The iPad has been useful when reading articles in class being able to highlight and annotate things on it...”

“My favourite app so far though is “Paper”. I have been using this app to draw pictures that I will then be able to use as my own resources in PowerPoint or active inspire...”

“I have also taken photos of some of the work that we have produced in method sessions...”

c) Reflective practice

We are beginning to see the students thinking about how the devices can be used for reflective practice. This allows them to capture data about their practice, and then easily share this with their mentor either in the university or in their partnership placement practice school. This kind of practice is transformational (McCormick & Scrimshaw, 2001) in terms of what they could previously do with the technology.

“I have had the opportunity to record short starter activities and teaching tasks which have allowed me to critically evaluate the way I teach...”
(History student teacher)

“I recorded my micro-teaching lesson today with my iPad so it will be helpful to have a look at it with my mentor in school and try to raise some aspects that I can improve...” (Languages student teacher)

d) Classroom usage

The students are starting to go into their partnership schools and classrooms, and there are some opportunities for them to be able to use the devices in the classroom. Students are also investigating with mentors how these might be able to be used more widely in the school.

“I used the device to record students where there were not enough Dictaphones...” (Geography student)

“Useful apps for the classroom I have downloaded are a name generator and a timer...” (English student)

“The ability to draw on top of documents using Sketch is a great alternative for when a Smart board is not available...” (English student)

What is interesting here is again the opportunity for transformational practice that the affordances of the technology allow (Aubusson et al., 2009), those of mobility and customisation especially with the incredible cheapness of the software, often free and rarely above £1.00.

e) Some initial issues

The introduction of the devices has not been without problems. Two of the devices (from a total of 150) had some technical issues that resulted in the devices having to be brought back to the centre for repair, and to this end we do have a stock of “replacement” devices, which can be used for this purpose. In addition, the mindset of using the device and the practical learning in using it, especially for those who have come from a non-Apple

background, caused a number of issues. Comments from the students include:

“I have been having some problems to manage all the information, personally I think that we have access to (so) many information what can make it confusing...” (Languages student)

“I have also found that it is easy for me to forget to do things on it, such as the journal as I am not seeing it in my bag everyday like I would have it was in paper format...” (Languages student)

“I can't use my iPad at my placement school, I don't have the Wi-Fi password yet...” (English student)

“I have noticed that it is difficult to keep track of work as it is available in a range of places, and it is quite easy to skip past something when it isn't completed...” (Languages student)

“I won't be able to use it in school because they have a no iPad policy...” (Languages student)

“While my placement school has no problem with my use of the iPad within my teaching, they equally prefer working “on paper” for administrative purposes. This will therefore require me to copy up their handwritten observation notes onto the digital file...” (English student)

We have also experienced some technical issues with the provisions of Apple TVs in the teaching classrooms and the distribution of applications for specific groups, rather than the whole cohort.

8. Conclusion and Implications

At the time of writing, the project is still in progress and so the data is still in its initial stages (see above). We expect that by March 2014 we will have rich data from the university-based experiences of the students over the first 12 weeks of the course and their time on placement from November 2013. We will be able to further analyse data from the baseline surveys using descriptive statistics and deductive coding to create a broad overview of patterns of use before the deployment of the technologies. We hope that the conference committee sees that this is an exciting and innovative project – we believe it is the biggest of its kind in teacher education in England at this time, and already the unanalysed data is showing an excitement about the use of the devices in both the student and the tutor population of the Faculty of Education allowing innovative learning to take place.

The implications for both our own institution and wider are that it offers a serious challenge to the lecture as a key teaching strategy and a move to a more inquiry-based and personalised learning style that has the

potential to allow multi-model and multi-synchronous teaching and learning. Whilst this has been postulated widely for many years, we believe that the tablet technologies offer a practice as well as a pedagogic solution.

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IPADS AS COLLABORATIVE TOOLS TO ENHANCE BIOLOGICAL IDENTIFICATION SKILLS IN THE LAB AND FIELD

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Abstract

According to the Chartered Institute of Ecology and Environmental Management, today's biology graduates lack the key species identification skills required by prospective employees. This mismatch between students' skills and employers' requirements has serious implications for employability after graduation. Interactive species identification apps on mobile learning devices, such as iPads, have the potential to encourage active engagement with the process of identification and provide a means for students to (re)connect with nature. A pilot study funded by a Keele University teaching innovation grant and School of Life Sciences teaching equipment grant investigated the potential of iPad educational apps to boost species identification skills. Working in pairs, twelve final year undergraduate students were given one hour to locate eight target trees on the Keele campus using the Here&Near app and then utilise four tree species ID apps (FSC trees, ForestXplorer, LeafsnapHD and Isoperla's TreeID) to identify the tree species. The students completed pre- and post-activity evaluation questionnaires and produced a post-activity reflective audio commentary using Fotobabble. The pre-study questionnaire revealed that 92% of students thought tree ID apps would aid identification skills, while only 50% of students agreed that iPads would facilitate collaboration. The post-study evaluation revealed that not all tree apps were equally useful in learning, along with a transformation of student opinion regarding the collaborative aspect of the activity. The second phase of the study is to embed a modified version of the tree tour into a first year undergraduate practical, and evaluate how this affects the ability

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