



## You are here: Students map their own ICT landscapes

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It is clear that most university students make extensive use of information and communications technologies (ICTs). Many studies have attempted to describe the extent of this use. However, gaining a clear understanding of where, how, and why students use these technologies is more elusive. This project follows students as they use these technologies in their everyday lives, asking them to become co-researchers to take photographs, create diaries and record voice memos of their experience over a full day. Through the use of this novel qualitative approach a rich description of the perspective of student use of ICTs can be developed. The analysis of these data is also informed by a student survey on the use of ICTs. This work shows that students at the University of Cambridge are generally confident users of a number of ICTs, and suggests that students use multiple technologies in parallel to achieve a range of study, leisure and social tasks. In addition, a notably large proportion of Cambridge students reported making use of Facebook to manage their social lives. An analysis of reported locations suggests that students, and particularly undergraduates often use computers in their college rooms for extended periods. The article concludes by reflecting on the day experience method and suggesting possible adaptations for future studies.

Keywords: information and communications technology, qualitative methods, space and time, education

### Introduction

There have been several studies emerging in the past few years examining student perspectives on the use of information and communications technologies (ICTs). In the European context, Haywood et. al. (2004) and the SPOT Plus Project (2005) each report on comparisons between student use of ICTs at higher education institutions. The ECAR study in the United States (Kvavic & Caruso, 2005) and in Australia the work of Kennedy et al (2006) have looked at this area in detail. While some compare traditional pedagogical methods to teaching with technology, many of these studies have tended to use technology as the axis of their investigation, rather than the student experience itself. This paper aims to explore and map the use of technology in students' everyday lives as one part of the Learning Landscape Project on teaching and learning at the University of Cambridge.

In October 2006 The University of Cambridge received funding from the Higher Education Academy to undertake an e-learning benchmarking exercise as an HEA Pathfinder project (Learning Landscape Project Team, 2008). The University decided to undertake this exercise within the context of the broader learning and teaching environment, rather than looking at e-learning in isolation. As a result, the Learning Landscape Project (LLP) was established to create a "map" of teaching and learning practices and processes at the university. The project investigated the teaching methods which underpin undergraduate and graduate programs with a view to exploring how students may be offered the best opportunities to learn. The evidence base built up by this project forms the basis for cross fertilization of teaching and learning practice, supports the development of new teaching and learning innovations, and informs a new phase of the University's Teaching and Learning Strategy (Rivers, 2007). In addition to the HEA e-learning benchmarking exercise, one of the aims of the LLP was to "stimulate discussion on current provision, exploring whether it remains fit for purpose, and contemplating possible changes in provision, with particular emphasis on appropriate use of small group teaching and e-learning" (Rivers, 2007). Thus while the LLP brief was quite broad, this article reports on research conducted as part of the LLP specifically relating to student use of information and communications technologies.

## Methods

### Student survey

The project began with a survey of students' use of ICTs, conducted over three weeks in April 2007, during the final term in the Cambridge academic calendar (known locally as "Easter Term"). There were 1923 respondents from all 31 colleges of the University, constituting approximately 11% of the total student population of undergraduates and postgraduates. Responses were collected on paper (n=25) and electronically (n=1898) via the online survey tool SurveyMonkey. An email was distributed via the Senior Tutors of the Cambridge Colleges, inviting students to take part in the survey in order to provide the University with useful information to cater for student needs. As an incentive, survey participants were offered the chance to win a video iPod.

### Day experience method

ICT survey respondents were invited to participate as co-researchers in one of four qualitative studies, designed to follow up on results generated by the survey: the *Day Experience Method* (Riddle and Arnold, 2007), the *Very Advanced Technology Method*, the *Shutdown Challenge* and the *Movers and Shapers Method*. A further follow up on these initial studies was carried out at the start of the next academic year, in October 2007, for an LLP sub-project known as *A Day In The Life*. The research methodology deployed in *A Day in the Life* was based on the previously used day experience method. The qualitative data this article draws upon therefore comes from the two day experience studies conducted over two terms. This method was inspired by social and behavioural science methodologies including the *Experience Sampling Method* (Hektner et al, 2006; Intille et al, 2003), the Day Reconstruction Method (Kahneman et al, 2004) and work on *Cultural Probes* (Gaver et al, 1999; Arnold, 2004).



**Figure 1: Equipment used by students for the day experience**

The method requires participants to record answers to a series of simple questions at irregular intervals during a 24 hour period from noon to noon. Questions included 'Where are you?', 'Who are you with?' and 'What ICTs are you using?', and 'How do you feel about it (the technology)?'. The participants were prompted to make a record of their activity via an SMS message (or 'ping') to their mobile phone. They were required to use a notebook, a camera and (if desired) a voice recorder to record answers to each of the questions (Figure 1). These records constituted the primary research data, and participants were informed that they needed to be appropriately detailed. A short time after the conclusion of the day experience, all of those participating in the method were brought together for an informal focus group, where selected participants showed their photographs and described their day. A member of the research

team facilitated the discussion, which was taped using a video camera. Selective transcriptions of these recordings constituted further data for analysis.

A total of 35 students took part in the day experience, in 6 cohorts over two terms. Each cohort also took part in one facilitated focus group for a total of 6 focus groups. All data was anonymised, and all participants are referred to by pseudonym for the purposes of this article.

## Results and discussion

### Cambridge students as ICT users

The student survey indicated that ICT use at Cambridge is thoroughly integrated into students' lives, to the point where its absence is felt by students to be a barrier to study. Undergraduate students in particular often work alone in their rooms. Computer use and internet access are an integral part of this room-based work routine, and many College rooms are now equipped with internet access via high-speed Ethernet. Mobile phone use appears to be near-universal among students (see Table 1), and during term time, students rely heavily on their mobiles to make social arrangements, to arrange face-to-face meetings with peers and to communicate with friends in other Colleges.

Cambridge students rely increasingly on internet access and see its absence as a critical barrier to study. In students' eyes, internet access is increasingly presumed to equate to wireless access. This study suggests that the extension of the University's existing wireless network is likely to be perceived by students as highly beneficial (see *Location and ICT use*, below). Students say that internet access is of critical importance to them for study for access to online study materials (e.g. ebooks, online lecture notes, CamTools), to library catalogues and resources, to the internet for research, to formal peer learning activities; for communication and time management, through access to email and online calendars (among other tools); and for personal and social reasons, through access to instant messaging, digital media, and social networking sites such as Facebook.

Students were also generally confident using a range of information and communications technologies. The ICT survey showed that a vast majority of students were confident with the technologies surveyed with the notable exception of electronic journals (64% confident) and bibliographic tools (34%).

**Table 1: Frequency of use of technologies by Cambridge students**

Answer options	Several times day (%)	Once a day (%)	At least once a day (%)	Response Count (n)
Email	1799 (96.1)	61 (3.3)	1860 (99.4)	1872
Face to face communication	1746 (93.4)	33 (1.7)	1779 (95.1)	1870
Non-academic websites	1401 (74.9)	250 (13.1)	1651 (88.2)	1871
Mobile Phone	1311 (70)	268 (14.3)	1579 (84.3)	1872
Word processor	801 (43.8)	283 (15.1)	1084 (57.9)	1872
Social networks	758 (40.5)	417 (22.3)	1175 (62.8)	1870
MP3 Player	470 (25.2)	220 (11.7)	690 (37)	1865
Chat Programs	460 (24.6)	224 (12)	684 (36.6)	1867

### Social networks

The Student ICT Survey found that 88% of all Cambridge students (undergraduate and postgraduate) use social networks (almost exclusively Facebook) with 63% using it at least once a day and 44% using it several times a day. Undergraduates used Facebook more intensively than graduate students, with 76% of undergraduates using the site at least once a day. Students' enrolled study area was a factor in social network use; for example, 58% of Law students use the site several times a day (compared with 51% of all undergraduate students).

Students were more likely to browse Facebook than they were to surf College, Faculty or University websites, and in fact were only slightly more likely to use a word processor. Comparing these results with a recent national survey (JISC, 2007), we found that Cambridge students are keeping pace with national usage levels in UK higher education.

Considering that Cambridge requires one of the highest overall student workloads (including time spent in private study) among UK institutions of higher education (Sastry and Bekhradnia, 2007) the significant amount of time Cambridge students invest in browsing Facebook appears perhaps even more notable. During the day experience, there were references by students to casual, frequent Facebook use (Table 2).

**Table 2: Examples of Facebook use from the day experience**

<p>3:00 pm I was browsing Facebook when I got the text. I was bit bored after transcribing a video of a student that I interviewed. So took a break from that to go web browsing.</p> <p><i>Diary extract from Doris, PhD student in Education</i></p>
<p>(In response to a question about which students used Facebook more than once a day)</p> <p>I put my calendar on it, so I have to look at it. One of the applications I have on it is the calendar because I check it so much ... probably a step too far, but...</p> <p><i>Focus Group quote from Abbi, 3<sup>rd</sup> Year Chemistry Student</i></p>

### Students as multi-taskers

An important theme to emerge from the analysis of student day experience diaries and voice transcripts was *time*. It became clear from reading student transcripts that it was absolutely normal for students to engage in multi-tasking. Students discussed ways in which they perform more than one activity at a time, including combinations of academic, work-related, social, personal and leisure tasks. Students not only mixed study with social and leisure activities, they frequently reported using multiple technologies simultaneously to engage in different tasks. Table 3 shows three representative responses from students detailing the use of a range of technologies in their college rooms. While some of the activities are study, the use of multiple technologies affords parallel involvement in social and leisure activities such as listening to the radio, reading an online comic or planning for a ball.

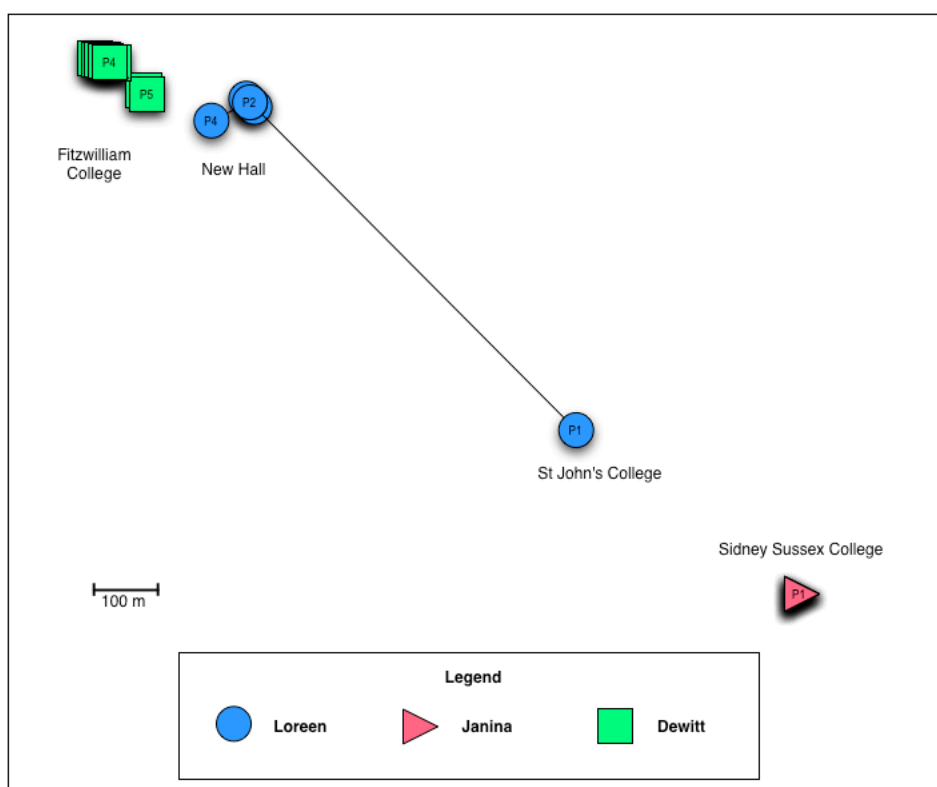
**Table 3: Multi-tasking students from the day experience**

<ul style="list-style-type: none"> <li>○ I am still in my room at Harrison House in front of my computer</li> <li>○ I am alone, but talking to my boyfriend online.</li> <li>○ I am splitting my time between researching a particular scholar for my thesis and reading my favourite web comic (XKCD). I am also listening to a particular favourite song ("Feathers" by Coheed and Cambria).</li> <li>○ I feel great after having discussed my research with my supervisor &amp; solidified essay &amp; thesis topics. I am also feeling a little guilty for procrastinating &amp; reading web comics instead of doing real work. I'm also thrilled that a bought a pumpkin to carve this evening.</li> </ul> <p><i>Diary extract of Tegan, Archaeology MPhil student</i></p>
<p>Morning all. It's ten past nine. I'm in my bedroom at college. I'm using the internet to read some Spanish newspapers. I've got a Spanish exam later on today, so I'm just swotting up there. I've also got my little radio on, listening to Radio 4 and people talking about international negotiation. Very interesting.</p> <p><i>Voice transcript of Sofia, 2<sup>nd</sup> Year Modern Languages student</i></p>
<p>4:37pm I'm multi-tasking!</p> <ul style="list-style-type: none"> <li>○ I'm working on my reading for a supervision on Thursday (why do we have so many pages of prescribed reading ?!) , as well as (chatting) online with an old friend.</li> <li>○ I'm at my desk in my room, by the way. It's a nice room; "split double", with my roommate occupying the top portion of the room. I'm starting to believe that this is unique to my college!</li> </ul> <p><i>Diary extract of Loreen, 1<sup>st</sup> Year Law student</i></p>

## Location and ICT use

A second major theme used during our analysis was *space* (Howell, 2008). By analysing responses to the question ‘Where are you?’ during the day experience, it is possible to map the location of multiple students over time. Figure 2 shows a typical pattern for students who took part in the study. In the residential, collegiate environment of Cambridge most students travel only small distances on foot or by bike. In particular, undergraduate students often tended to spend quite a large proportion of their day within their own College.

Students took photos at each point where they received an SMS prompt, and recorded the techniques and technologies they were currently using. The combination of these data builds a rich illustration of their spatial environment and the places they were using specific technologies.



**Figure 2: Overview map with locations of three Cambridge students during the day experience (P1 represents the first SMS, P2 the second, and so on)**

During the day experience, students regularly referred to using computers on their own in their College rooms (see Table 4). They commonly referred to using laptops in their room to write essays and assignments, check their email, browse the web in their room, and to listen to music.

The study showed that students also sometimes use laptops to work in informal indoor or outdoor spaces, particularly where wireless internet access is available. A small proportion of our participants avail themselves of public wireless provision in central Cambridge, working in cafés or even outdoors. However, this practice appears to be limited at present. Only one student in the two cohorts of qualitative-research participants reported working regularly in a commercial public space – in this case, a café in central Cambridge.

## Future work

The day experience method was particularly good at producing useful data for this project, and a repeat of this method is being conducted in a pilot study in an Australian context at Latrobe University, at the time of writing (Riddle, 2008). There were some logistical difficulties presented by the use of disposable cameras during the study, due to the necessary time for processing of photos to digital format for use in the focus groups. It is recommended that future implementations of this method should use digital cameras. It would be useful to be able to combine the signaling device (a phone in this case) with the recording device, so tests are also underway for the forthcoming project at Latrobe University using an

**Table 4: Student references to ICT use in their College rooms**

<p>15:53</p> <ol style="list-style-type: none"><li>1. In my room (after a brief rain-soaked excursion to the geography department)</li><li>2. I am doing preparations for the college May Ball- surfing the Internet to research attractions (I am in charge of this area). Just realised the meeting is...now-about to go out</li><li>3. I am using the computer and I am on my own</li><li>4. Feel quite excited as I've had a good idea for the ball...but bad I've put off doing work. And hassled – I'm going to be late and I as supposed to buy sweets – better go!</li></ol> <p><i>Diary extract of Janina, 2<sup>nd</sup> Year Sidney Sussex student</i></p>
<p>14:02pm</p> <p>In my room in college, alone, checking e-mails and Facebook and being annoyed with my laptop as it is breaking. So, feeling annoyed – trying to work, can't.</p> <p><i>Diary extract of Dewitt, 1<sup>st</sup> year Fitzwilliam student</i></p>

Apple iPhone. This smart phone with internet capabilities can take photos, record voice memos, and allows the entry of text notes via an on screen keyboard. A free application called Evernote is being evaluated for this purpose. An added advantage of smart phones such as these is their incorporation of global positioning systems, which are capable of recording latitude and longitude coordinates along with entries in the form of 'geotags'. This potentially makes mapping participant responses over the course of the day experience more simple and accurate.

## Conclusions

Through the use of innovative qualitative techniques, Learning Landscape Project was able to develop an extensive empirical basis for understanding how, why, and where university students use information and communications technologies. This paper shows some of the possible ways in which this evidence base can be used, but there are many more. There are inevitably limitations to this understanding due to the relatively small sample size. However the extent and nature of the qualitative data collected generates a fuller picture than is otherwise possible with traditional survey data. Engaging participants as active and intelligent co-researchers rather than passive participants encourages them to contribute personal insights and extensive detail.

The project demonstrated that technology use is rarely as simple as it may seem. Students do not use specific technologies in a serial way. As devices become smaller and wifi networks are more common, the use of technologies also increasingly resists characterisation in terms of time and place. With this qualification, many students reported using laptops, and tended to use the internet connection in their college rooms for a range of different purposes. While the majority of students reported using laptops in a relatively "traditional" way, to working individually in student study-bedrooms, it is anticipated that the continued expansion of wireless networks in and beyond the campus environment—for example, into College and university libraries—may impact on this pattern. Students were generally confident users of most ICTs, and used email and social networking sites extensively.

Themes and issues drawn from the Learning Landscape Project are being shared with the Project Board, the Steering Group, and at Group Meetings in Faculties, Departments, and Colleges at the University of Cambridge as part of the LLP project process. Certain findings are also reported to the HE Academy as part of the HEA Pathfinder process.

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## References

- Arnold, M. (2004). The Connected Home: probing the effects and affects of domesticated ICTs'. In *Artful Integration: Interweaving media, materials and practices (Vol. 2). Proceedings of the Eighth Biennial Participatory Design Conference*. [viewed Dec 3, 2007].  
<http://www.hps.unimelb.edu.au/connectedhomes/publications/connected%20homes.doc>
- Becta (2007). 'Using photography, audio and video recording equipment to gather data', Becta website.  
<http://partners.becta.org.uk/index.php?section=rh&rid=13506> [viewed: 12 December 2007].
- Gaver, W., Dunne, T., & Pacenti, E. (1999). Design: Cultural Probes. In *Interactions*, 6(1), 21-29.
- Haywood, J., Haywood, D., Macleod, H., Baggetun, R., Baldry, A.P., Harskamp, E., Teira, J., Tenhonen, P. (2004). A comparison of ICT skills and students across Europe. *Journal of eLiteracy*, Vol 1 (2004), 69-81.
- Hektner, J.M., Schmidt, J.A. & Csikszentmihalyi, M. (2006). *Experience Sampling Method: Measuring the Quality of Everyday Life*. London: Sage.
- Howell, Catherine. (2008) *Space*. Project Report. Learning Landscape Project, University of Cambridge.  
[http://www.caret.cam.ac.uk/blogs/llp/wp-content/uploads/llp\\_public\\_t1report\\_13\\_space\\_final\\_v06.pdf](http://www.caret.cam.ac.uk/blogs/llp/wp-content/uploads/llp_public_t1report_13_space_final_v06.pdf) [viewed 6 August 2008]
- Intille, S.S., Munguia Tapia, E., Rondoni, J., Beaudin, J., Kukla, C., Agarwal, S. and Bao, L. (2003). Tools for studying behavior and technology in natural settings. In *Proceedings of UBIComp 2003: Ubiquitous Computing*, vol. LNCS 2864, Berlin Heidelberg: Springer, 2003, 157-174.
- JISC (2007) *Student Expectations Study*. Report of the Joint Information Systems Committee.  
<http://www.jisc.ac.uk/publications/publications/studentexpectations.aspx> [viewed 27 Nov 2007]
- Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A Survey Method for Characterizing Daily Life Experience: The Day Reconstruction Method. In *Science*, 306(5702), 1776-1780.
- Kennedy, G., Krause, K.-L., Judd, T., Churchward, A., & Gray, K. (2006). *First Year Students' Experiences with Technology: Are they really Digital Natives?*  
[http://www.bmu.unimelb.edu.au/research/munatives/natives\\_report2006.pdf](http://www.bmu.unimelb.edu.au/research/munatives/natives_report2006.pdf) [viewed Feb 28 2007]
- Kvavic, R. B., & Caruso, J. B. (2005). *ECAR Study of Students and Information Technology, 2005: Convenience, Connection, Control, and Learning*. <http://www.educause.edu/ecar>
- Learning Landscape Project Team (2008). *The Cambridge Pathfinder Journey: The Experience of the Learning Landscape Project*. [http://www.caret.cam.ac.uk/blogs/llp/wp-content/uploads/llp\\_pathfinder\\_journey\\_v03.pdf](http://www.caret.cam.ac.uk/blogs/llp/wp-content/uploads/llp_pathfinder_journey_v03.pdf) [viewed 29 July 2008]
- Riddle, M. (2008). *ICTs in the Daily Lives of Australian Students: A Pilot Study*.  
<http://www.matthewriddle.com/ict-study/> [viewed 29 September 2008]
- Riddle, M., and Arnold, M. (2007). *The day experience method: A Resource Kit*.  
[http://www.matthewriddle.com/papers/Day\\_Experience\\_Resource\\_Kit.pdf](http://www.matthewriddle.com/papers/Day_Experience_Resource_Kit.pdf) [viewed 29 July 2008]
- Rivers, R. (2007). *A Short Guide to the Learning Landscape Project*.  
[http://www.caret.cam.ac.uk/learninglandscape/LLP\\_Short\\_Guide.pdf](http://www.caret.cam.ac.uk/learninglandscape/LLP_Short_Guide.pdf) [viewed 29 July 2008]
- Sastry, T. and Bekhradnia, B. (2007) *The Academic Experience of Students in English Universities*. Higher Education Policy Institute. <http://www.hepi.ac.uk/pubdetail.asp?ID=240&DOC=reports> [viewed: 27 November 2007]
- SPOT Plus Project (2005). *Survey Report: Student's perceptions of the use of ICT in university learning and teaching*. [http://www.spotplus.odl.org/downloads/Survey\\_report\\_final.pdf](http://www.spotplus.odl.org/downloads/Survey_report_final.pdf) [viewed 28 February 2007]

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