

Patterns of students' use of technologies

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The paper describes the findings from a study of students' use and experience of technologies. A series of in-depth case studies were carried out across four subject disciplines, with data collected via survey, audio logs and interviews. The paper will concentrate on the survey data, which consisted of a mixture of qualitative and quantitative results. It will compare this findings with related international surveys on students use of technologies and argue that taken together this wider body of evidence indicates that students are immersed in a rich, technology-enhanced learning environment and that they select and appropriate technologies to their own personal learning needs. The paper concludes by suggesting that the findings have profound implications for the way in which educational institutions design and support learning activities.

The study was undertaken as part of the JISC learner experience programme (http://www.jisc.ac.uk/elp_learneroutcomes.html). The research focused on two main questions: How do learners engage with and experience e-learning (perceptions, use and strategies) and how does e-learning relate to and contribute to the whole learning experience? We used a broad definition of e-learning 'the use of any kind of internet or communication service or electronic device that supports ... a learning activity'. To ensure a wide range of student experiences data was collected with the support of four HE Academy subject centres:¹ Medicine, Dentistry and Veterinary Medicine, Economics, Information and Computer Sciences, and Languages, Linguistics and Area Studies.

Data collection consisted of three main sources: an online survey, audio logs and interviews. The combination of methods provided rich empirical descriptions of use and perceptions of technologies but also ensured there was some triangulation of data. The participating institutions provided a range of contexts across the UK – old and new institutions, city and regionally based. The online survey² was used to gain a wider contextual understanding of learners' experiences, whereas the case studies of individual learners (via the audio logs and interviews) described the nature of the e-learning activities carried out by the learner. The survey gathered data about access to technologies, level of competence and perceptions about the use of technology for study. It contained a series of matrices of technologies against types of learning activities

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¹ <http://heacademy.ac.uk>

² http://www.geodata.soton.ac.uk/eLRC/learner_survey/

derived from the DialogPlus taxonomy (Conole, 2007b) as a basis for categorising types of technology and their use.

As described by Mayes (2006) we used purposive sampling rather than random sampling or comparison groups and selected ‘information-rich case studies that manifest the phenomenon’ (Mayes, 2006). Our intention was to follow students who showed a lot of experience in using technology to support their learning. We used the results of the survey and students availability (the students could indicate whether or not they were willing to participate further) to make a selection of learners from across the subject centres for in-depth case studies. Students were asked to provide regular audio-logs to demonstrate the different ways in which they were using technology. See Conole (2007c) for a description of our use of audio logs.

Table one gives the breakdown of data collected. The central purpose of analysing the qualitative data was to extract and generalise from the complexity of the data evidence concerning e-learning activities and experiences in order to answer the main research questions. Removal of incomplete or corrupt survey results produced a dataset of 427 valid entries. These entries were then sorted according to subject centre and divided into qualitative and quantitative responses and further analysed with Excel and SPSS. A broad descriptive analysis was carried out to identify emergent patterns. We used descriptive statistics to observe the basic features of our data set in order to categorize the data and detect patterns in the use of technology in relation to certain learning activities. These patterns were then analysed to see if there are differences between the participating subject centres. The qualitative data was organized and coded according to emerging patterns and the results ranked, proportioned or directly quoted to support the quantitative findings. The case studies (audio logs and interviews) were used to provide more in-depth information about the strategies that the students used and how the technologies influenced their approach to learning and the impact this had on their daily lives. Further details are described in the final project report (Conole *et al.*, 2006).

---- Insert table one about here ----

Table 1 Breakdown of data collected

The findings provide a valuable snapshot of the ways in which students are using technologies to support their learning, both in terms of how they find and use information and in how they use different communication mechanisms to raise queries and discuss issues with other students and their tutors. The data reveal that students are learning in a complex and changing environment, using a plethora of technological tools to support their learning. Computer ownership is high and students have become accustomed to being able to electronically access information or people on demand. The characteristics of the net generation suggested by Oblinger and Oblinger (2005), are evident in the data: students are adept at finding and manipulating relevant information and synthesising across different information sources and use a variety of communication tools to support their learning needs. Also there is evidence from the data that there is a shift from passive to more interactive interactions across all aspects of their learning, which is another characteristic of the net generation.

The conference presentation will concentrate on the findings from the survey and will compare these in particular to two recent international surveys. The first was undertaken by Kennedy *et al.* (2006) in an Australian context. Their findings concur with ours; that the environment in which students are working is complex and multi-faceted. Technology is at the heart of all aspects of their lives. Kennedy *et al.* (2006) assert that 'Universities are ill-equipped to education a new generation of learners whose sophisticated use of emerging technologies is incompatible with current teaching practice'. Our findings support this and point to a mismatch between our current offerings and student use and a further mismatch between institutions' perceptions of student use of technology and actual use. Therefore a key question for institutions is whether institutional infrastructures match students' own rich technology-enhanced environment and perhaps more importantly whether courses are designed and delivered with these external influences in mind. The second study provides an in-depth picture of technology use by undergraduates in the States and again points to an ever increasing technology-enhanced learning environment (ECAR, 2007).

The findings suggest a shift in the way in which students are working and suggest a rich and complex inter-relationship between individuals and tools. The findings have profound implications for both the technical infrastructure institutions provide for students and the ways in which we support their learning through use of technologies.

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