

Researching Learners' Journeys

STROLL: a JISC funded project

(Student Reflections On Lifelong e-Learning)

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‘...only learners themselves can learn and only they can
reflect on their own experiences.’

(Boud, Keogh et al. 1985)

‘Education is in an interesting phase between
its ‘ICT-free’ past and its ‘ICT-aware’ future.’

Diana Laurillard

Foreword to ‘Rethinking Pedagogy for a Digital Age’ (Laurillard 2008)

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Executive Summary

The STROLL (Student Reflections on Lifelong e-Learning) project was a 2 year JISC part-funded project which captured a range of learners' experiences from their HE journeys. 54 students, enrolled at either the University of Hertfordshire (UH) or Hertford Regional College (HRC), participated. The project focussed on students' engagement with technology to support their learning. The University of Hertfordshire's bespoke managed learning environment (MLE), StudyNet is central to e-learning provision and strategy at the university.

Project Aims and Objectives

The aim was to examine the changing nature of the student learning experience with technology over a longer elapsed period of time than was being measured by other LXP2 projects. The research questions were:-

- How do learners experience change through their learning journey?
- How do students use and make choices about their time?
- How do students use e-learning tools to support their learning?
- How do students use their personal technologies?

Overall Approach

The STROLL approach was learner led and focussed on the collection and analysis of qualitative data through the use of video or audio diaries from students' own regular recordings about their changing learning experiences. The diaries were recorded for a week at a time at approximately 6 monthly intervals to provide a snapshot of their experiences. Students could choose to use camcorders, webcams or digital audio recorders. In addition telephone interviews were held between the 1st and 2nd diaries to provide clarification of the analysed data and a series of focus groups were held midway through the project for the same reason. The methodology paper is available at www.tinyurl.com/5vvqom.

Summary Findings

STROLL learners were enthusiastic users of all sorts of technology to support their complex social and study lives. All had mobile phones and 74% owned their own computer, 88% accessed the internet at least daily. Those who were registered as full time students were likely to have at least one and often more part-time jobs.

- All accessed the internet regularly for learning support and most expected to continue their studies beyond the 9-6 Monday to Friday window when classes were held.
- The busier the students the more likely they were to be highly organised in their use of time (whether as parents or in paid employment), using StudyNet strategically for completing their studies, often through the evenings.
- Students moving from FE to HE reported a much increased workload and an expectation of needing to work independently.
- All the students, except one, commented highly favourably on the provision of the MLE StudyNet and how essential it was for providing online support for their learning.
- Students demonstrated a growing maturity in their choices of technology and their use of online tools to support their learning towards the end of their courses.
- Students used their own technologies such as mobile phones and mp3 players creatively as an integral part of learning.

The Learners' Journeys: Researching student perspectives of using technology to support their learning

1.0 Introduction

In September 2007 JISC published its latest survey into the expectations of learners aged 16-18 and anticipating study at tertiary level in UK universities (JISC MORI, 2007). Its outcomes confirmed what a number of previous research studies had already indicated e.g. Educause, (Oblinger and Oblinger 2006), that this incoming generation of university students are more adept at using technology overall and now expect to use it to support their studies in a way that had not been seen in previous generations. Various names have been given to the generation of late teens approaching adulthood and many of these link them to the use of technology either socially or for work and study, e.g. 'The Google generation', 'Net Geners'. Many students arrive at university with a wide repertoire of IT-related skills already formed, often largely derived from their personal and social uses of technology, (Nicholson, Macleod et al. 2005) and there is little room for doubting that this generation of learners are more competent in using digital technologies to find out information to support their learning. However not all incoming students belong in the category of the 'Google generation' and their skill sets may not include the apparently easy familiarity with technology that others have. In this complex situation, the transition to independent study at university and the learning journey they embark on is a critical time for all students regardless of age and background. The STROLL project set out to investigate how a group of learners uses technology through their learning journeys while in Higher Education as one of the 7 JISC funded Learners' Experiences of e-Learning Phase 2 projects.

The STROLL (Students' Reflections On Lifelong E-Learning) Learners' Journeys project at the University of Hertfordshire was part-funded by JISC for two years from March 2007 to February 2009. The metaphor of travelling through their learning, or 'strolling' for learners as they journeyed through their studies has been used as an appropriate way to identify how the learners who took part in this study have changed and matured through their own learning experiences at university. Among the set of seven Learners' Experiences2 projects (LXP2) (<https://mw.brookes.ac.uk/display/JISCle2>) taking place through 2007 to 2009, STROLL was unique in seeking to investigate the nature of the students' experiences over an extended period of some 18 months and using reflective video diaries as its primary means of data collection.

This paper presents an analysis of the findings from the STROLL project data with many examples from the students' own words used to describe their various experiences. It starts by considering the place of technology within the learning environment of the University of Hertfordshire. The paper then considers the location of the project at a time when social networks were growing in importance for the HE student population. The paper then presents findings from the four areas of research that the project set out to investigate with summaries of the findings for each. Finally there is a summary of the key issues resulting from the project in relation to the changing experiences of the learners.

1.1 Background to the University of Hertfordshire

The University of Hertfordshire is located 20 miles north of London in Hatfield and St Albans. There are approximately 25,000 FTE students based in 6 Faculties and across 3 main campuses. As well as online programmes and overseas franchises the University maintains close links with local FE colleges within the county. The University has embraced the use of advanced technologies to support its students and management and in particular with its managed learning environment (MLE), known as StudyNet. All students had access to StudyNet, which was introduced in 2001 and is now fully embedded in the university's study environment.

StudyNet provides access via the personalised student and staff portals to the websites for programmes of study and individual courses. These hold information about the content of individual study sessions (lectures, seminars etc) and provide access to e.g. online journals as well as collaborative tools such as discussion forum, virtual groups, wikis and blogs. Recent innovations to StudyNet mean that lecturers' podcasts and video-casts can be made available for students to download. Logins to StudyNet totalled over 7 million in the academic year 2006-07 and it is from this background that students were invited to volunteer for the STROLL study. While all students were clearly expected to make extensive use of the online facilities of the MLE, the STROLL reflections would identify whether this was seen as a positive support for their learning or whether the requirement to access the technology now seen by many academics as an essential skill, was in fact an unnecessary stress for students whether relatively new to the university or already settled in.

Between 2005 and 2010 the University is funded by HEFCE as a Centre for Excellence in Teaching and Learning (CETL), through its Blended Learning Unit (BLU). The university has invested strongly in technology to support learning and calls itself a '*blended learning institution*', where blended learning is described as:

'the thoughtful integration of classroom face-to-face learning experiences with online learning experiences' (Garrison and Kanuka 2004) .

Staff seconded to the BLU directed and managed the STROLL project. Administrative and technical support and pedagogic expertise throughout the project was provided by members of the BLU team and associates across the university.

1.2 The University of Hertfordshire's Managed Learning Environment - StudyNet

While anecdotal evidence nationally may point to a decline in confidence in the use of VLEs elsewhere in HE (e.g Deepwell and Malik, 2008), the University of Hertfordshire's MLE StudyNet has gone from strength to strength and its use is almost universally praised by the students who took part in the STROLL project. Accessing their study materials off campus via StudyNet was valued by the students as one of the definite advantages that technology has brought to learning. This ease of electronic communications noted and valued by the STROLL students as a means of supporting their learning was originally reported by Sharpe and Benfield et al in their early review of the undergraduate experience of blended learning: *'We find that student response is overwhelmingly positive to the provision of online course information to supplement traditional teaching. Students make regular and frequent use of electronic resources with few reported problems of access.'* (Sharpe, Benfield et al. 2005)

One reason for the positive value ascribed to StudyNet may be because the 'Managed' part of the UH Managed Learning Environment ensures that students see their personal portal as soon as they log in and this gives them a personal view of their own programmes and groups. So it could be included within the descriptive framework of 'Personal learning environments'. Earlier research into use of StudyNet had already identified strong student satisfaction, (Jefferies, Thornton et al. 2004; Barrett and Jefferies 2005; Thornton, Jones et al. 2005). Students from across the range of programmes at UH use StudyNet extensively as their first port of call for their learning support and have praised its convenience, as these STROLL students express. StudyNet is now a ubiquitous part of the study experience at Hertfordshire, and the one student who was less enthusiastic about the MLE was a keen user of technology.

Table 1 Using the Hertfordshire MLE- StudyNet

Using the Hertfordshire MLE StudyNet	ID
<i>StudyNet has become part of my life over the last few years. It is so easy to log onto and check up and see if I have got any e-mails and it is invaluable. Keeping in touch with your peers and the work on the project [when] you are all in different places.</i>	9
<i>The University has got StudyNet and a lot of lecture notes and lecture slides and even video or audio version of the lecture and discussion forums and e-mail and messaging</i>	37
<i>I also am on the StudyNet e-mail service a lot more. Always, always on it. Which was kind of different I guess because last year I hardly ever used it ever ... But this year it seems like if I don't I'm going to miss something serious, I'm going to fail or a lot worse. I use it a lot more.</i>	21
<i>StudyNet, it is my favourite just because of how useful it is really...all my course notes are put on, and any assignments ...and class discussions with your own little e-mail account, private messages as well...It has lots of features for my course and just fully supports me when I'm not in class.</i>	23
<i>... StudyNet has electronic journals and things like that so with out the Internet...because I live in London I would have to travel all the way up to Uni every day or every time I want to take out the books or Journal</i>	13
<i>I use the StudyNet to download all my study notes and all my assignment notes and I read my assignment through StudyNet I complete my assignment through StudyNet.(FE student HRC)</i>	47

1.3 Social networking between 2007 and 2009 and the impact on the STROLL students

The era of the STROLL project has seen a dramatic growth in the use of social networking sites as a potential for supporting students in HE. While other institutions may have considered adopting the use of social networks as a serious alternative to the VLE, at UH the team noted that StudyNet already had ample provision for providing informal discussion alongside formal discussion options for each module, with wikis, and blog facilities. The timing of the project came, in retrospect, at a significant point in the growing use of technology outside the classroom for tertiary students. The start of the project coincided with the sudden rise of Facebook social networking sites in the UK. Facebook had been previously used mainly at universities in the US since 2005 but there was a surge of interest in its use particularly with university students in the UK in the first half of 2007, in a way that had not been recorded with other teenagers' social sites such as Beebo and MySpace. In the time between the original writing of the bid and the start of the STROLL project, Facebook had started to take the UK HE scene by storm and its use also informed the early research questions and answers put to the STROLL volunteers.

Many of the students commented in their early reflections that checking Facebook was a daily activity but over the course of the project the team has seen the initial overwhelming enthusiasm for all things Facebook die down a little to the point where students acknowledge its importance overall for their social lives, but less so for their learning support. Table 2 includes a selection of comments about their use of social networks. At the time of writing (February 2009) the JISC Committee of Inquiry chaired by Sir David Melville is due to share their findings about the 'Google Generation' but discussions in 2008 implied that students preferred to keep Facebook for an informal personal networking site separate from their academic study.

Table 2 Using Social Networks

Using Social Networks	ID
<i>I have been using My space, Facebook, also used Second life. (May 2007)</i>	1
<i>...Actually I use Facebook a lot for communicating to people within my team. We use it as more a casual way [of keeping in touch]</i>	33
<i>We have a Facebook group from a course which is really useful in posting things up to see when everybody is in and keeping in contact with each other and [we]put our websites out there so we can get feedback up from each other</i>	44
<i>...certainly everyone I know is on Facebook and people checking it religiously, so I don't think there would be any worry about people missing information or what have you so yes. I don't feel that it is used enough really in an educational environment.</i>	42
<i>If I want to leave a message or a personal e-mail, I can do it on their Facebook account and it gets straight there.</i>	31
<i>[Facebook] also builds up a friendly relationship between the two of you or three or however</i>	31

<i>many there are and it builds up that relationship so that ... when you do face-to-face meetings, you can meet up and work at it.</i>	
<i>Really, we have our own sort of network there [in StudyNet], which I don't think the social network needs to fill in that gap</i>	23

2.0 The STROLL Research Questions and project methodology

The STROLL project alongside the other 6 projects in LXP2 had a number of research priorities to investigate. The main research question which the STROLL project addressed was:

- How do learners' experiences change through their learning journey,

The secondary questions which STROLL addressed were:

- How do students use/make choices about their time?
- How do students use e-learning tools to support their learning?
- How do students use their personal technologies?

In answering these questions we include how students used technologies to support their learning both through their own personal technologies and those provided by the institution. First of all there is a short description of the project methodology.

2.1 Methodology summary

The project used a qualitative approach for its methodology. Data was gathered via self-recorded video and audio diaries kept for a week at a time on up to 4 occasions during the 2 years of the project at approximately 6 monthly intervals. While the LEaD project at the University of Edinburgh also considered diary-keeping amongst new students and offered participants the choice of a paper format as an alternative to using technology for recording it, (Hardy, Haywood et al. 2008) none of the Hertfordshire students chose the hand written option preferring to use one of the other technologies offered which were webcam, camcorder or digital voice recorder. A small number of students had to record their thoughts in a blog when they were on placement and the recording technology was problematic, but this was not their preferred choice.

Video Diaries are defined in the online New Media Dictionary (NewMediaDictionary 2001) as:

'Video work in which events are related in a coherent manner. Inspired by written diaries, the video diary can be a personal diary, a travel diary or a diary that tells about a specific event in the author's life'.

Video diaries and similar personal technologies have been used to provide an innovative opportunity to study the learners' reflections on their experiences in a private space and at a close point in time to the original experience. This technology was employed by Conole in her 'Learner experiences of e-learning project' under Phase 1 of the JISC Learner Experiences of E-Learning project (Conole, de Laat et al. 2006), and had already been tried

out as a data collection method in 2007 at the University of Hertfordshire (Quadri, Bullen et al. 2007). Conole, noted in an online JISC report that:

'Diaries can provide rich data about the day-to-day events and contain a realistic account of the activities undertaken by the learners', (Conole, de Laat et al. 2006)

The aim of STROLL was to record students' own experiences and the diary recordings could be supplemented by the use of one to one interviews, optional focus groups and an online discussion group. The data analysis process is described in detail in the accompanying methodology report for STROLL lodged at www.tinyurl.com/5vvgom. It should be clarified that due to the relatively small numbers of students involved this was not intended nor is it claimed to be used as a statistically relevant study. The methodology is qualitative rather than quantitative and while many of the findings may be generally appropriate in other settings, the domain is the University of Hertfordshire (UH). The focus is learner-led, with student views and experiences central to the research design. As indicated below, an early quantitative survey undertaken in June/July 2007 by all of the projects provided information about the range of participants and the programmes on which they were registered in 2007.

2.2 Student Participation

54 undergraduate student volunteers took part in STROLL; they were recruited from across the 6 faculties at the University of Hertfordshire and from Foundation Degree programmes at Hertford Regional College. The UH students were enrolled on BA and BSc Honours programmes. All the programmes were campus-based. Demographic information about the students from the initial quantitative survey is included in Appendix 1. The ages of the participants ranged from 18 to 51 at the start of the project and the ratio of male to female participants was roughly 2:3. There was a racial diversity in the student population with 45% being white British and 6 other racial groups being represented. The participants reflect the diversity of the overall student population enrolled at Hertford Regional College and the University of Hertfordshire.

The diaries were recorded by students during teaching weeks in May 2007, October to November 2007, April 2008 and October 2008 using their choice of technologies from webcams, camcorders, digital voice recorders and paper based diaries. Students could choose the type of technology they wanted to use to record their diaries, within reason. Webcams were provided through the project funding for as many students who wanted to use them and these were a popular choice. There was a limited supply of camcorders for loan through BLU and some digital voice recorders were also available. Some students who opted to use digital voice recorders admitted they were shy about appearing on camera. Others lacked confidence in using the technology in spite of ample help being freely available. A private PC area was made available in student accessible rooms in the learning resources centres at UH and HRC for those students who wanted to use webcams but did not have their own computer. In the event this offer was not taken up. One wheelchair

limited student found the controls of a webcam were too fiddly to use on her own. Summaries of the technologies used for each diary are given in Appendix 2.

Student quotations from the diary transcripts given below in addition to the tables above and include the original identity number allocated from the student database to maintain their anonymity. The ethics permission granted are discussed in the project reports currently available from: <https://mw.brookes.ac.uk/display/JISCle2>.

3.0 How students experience change in their learning

In this section the paper addresses the following changing experiences which featured in the students reflections:-

- The impact of the changing use of technology for supporting learning from students' different starting points
- How students' uses of technology changed from what they had used before HE e.g. paper to digital media and their growing confidence in using technologies
- Developing as independent learners
- The experiences for students of moving from FE to HE
- The students' expectations about being online for their UH programmes and their increasing use of StudyNet over time
- Working collaboratively online from their second undergraduate year onwards
- Their increasing dependence on technologies for learning during their 'learning journey'

3.1 The impact of the changing use of technology for supporting learning

How did students reflect on the changes to their lives and study patterns since they started at university and did this tie in with their expectations? In terms of learners' expectations and the types of technologies used by students, some of the Hertfordshire students have indicated that their prior use of paper and writing has changed to an increased use of online materials and the use of word processing for all documents especially their assignments. There had been an increased use of technology to access study materials overall which may have crept up somewhat unobtrusively for the academics. For those entering HE especially as mature students, the high expectation of using materials which are only available online registered as a matter of surprise for some of them.

Table 3. The impact of the changing use of technology for supporting learning

The impact of the changing use of technology for supporting learning	ID
<i>I think nearly everything is IT focussed now, certainly everything you hand in has to be word processed, a lot of resources are now online.</i>	42
<i>I'm a mature student so my learning before university was very limited especially in the technology used so... the variety of technology that can be used to aid learning is probably the biggest difference.</i>	17
<i>The biggest change in learning I experienced will be because it's been such a huge gap</i>	49

<i>between present education as a student and my previous one, technology has moved on so far from research done in the library with books with no online facilities, now [its] at the click of a finger...t going back to studying has been a huge learning curve for me so the technology that I can use was laptops and things which are now available out there on the World Wide Web which were not available last time I was doing this (FE)</i>	
<i>The time I've spent on the computer has increased a lot... for 'A' levels most of it was hand written</i>	4

3.2 How students' uses of technology changed from what they had used before HE

Many students showed an increased confidence in using technologies as they settled into university life and exhibited a willingness to try out things they had not previously encountered but a small number (3) of the STROLL participants were reluctant to engage with new types of technology such as webcams for recording their diaries. While many students owned high-spec technology, some had not explored all the functionality and preferred to borrow one of the STROLL webcams rather than try to work out how to use the inbuilt facility for video recording which was on their own laptop. In the early stages of recording the diaries a higher proportion of the HRC students opted for using a digital voice recorder because it was so straightforward to use. In conversation they stated that they either did not want to use their own computer or were wary of the extra complexity required. It should be noted that at both the UH and HRC sites a computer was available in a private area for students to use as a daily diary facility and ownership of a computer was definitely not a prerequisite for taking part in the project. In their recordings however few students mentioned any lack of confidence in using technology and by their second diaries earlier uncertainties over using recording technologies had disappeared.

Table 4 Growing confidence in using new and different technologies

Growing student confidence in using new and different technologies	ID
<i>My use of technology has changed dramatically over the past year. I am definitely using it more to support my learning now than I was a few months ago</i>	43
<i>I am much more comfortable with using different technology now.</i>	54
<i>My learning has changed mainly because it's gone from physical to digital...from using pencils to do my drawings to using different mediums like Photoshop, flash and my pen tablet</i>	32
<i>I'm relying more and more on technology in this past year</i>	6
<i>I know what I'm doing now, especially in searching journals which used to be really difficult.</i>	46

3.3 Students developing as independent learners

Developing as individual and independent learners has become a refrain for many of the students taking part in STROLL as they reflected on how they had changed in their learning. Independence and taking responsibility for their own learning emerged as being part of what it meant to be a student in HE.

Table 5 Developing the skills of an independent learner

Developing the skills of an independent learner	ID
<i>Over the last three years I have studied independently more and more</i>	22
<i>Classes are a lot bigger and secondly it is very independent (FE to HE student)</i>	20
<i>My biggest change in learning is that learning in university is more independent</i>	39
<i>'Probably independence with learning [was the biggest change] , our course is very based on you doing it yourself</i>	44
<i>In the last year it has become more efficient and easy for me to use technology and as I go along I expect it will get better.</i>	41

3.4 The experiences for students of moving from FE to HE

One of the project's aims was to determine how FE students experienced the change of moving from one tertiary environment to another and the different expectations for them in HE. The FE students who took part in STROLL came mainly from Hertford Regional College (HRC) but others who had joined from other FE environments provided valuable insights where StudyNet had not been experienced before. Overall it was the volume of work and the size of the learning environment which surprised many students as they moved from Foundation degrees to their final years.

Table 6 FE students' experiences of moving to HE

FE students' experiences of moving to HE	ID
<i>Be prepared for a big leap. I have found the change from the HRC last year to the university this year to be huge. Just the sheer volume of reading that's required maybe that's just because I'm doing humanities course</i>	49
<i>When you start... you have to pick up things very quickly you know.</i>	52
<i>Your learning skills are going to be a bit different because they're not going to spoon feed you the work. You have to do I think forty hours a week of independent studies. From further education to higher education you're the one doing the learning, you're the one going to[find out about it]</i>	48

3.5 The students' expectations about being online for their UH programmes

Students had high expectations of being online regularly as they followed their various UH programmes and most recorded that their use of StudyNet increased over time. Not only is StudyNet widely used but it has been praised by students as being a 'one-stop shop' where they can access everything related to their studies. In their later diaries students commented on widespread use of journal to support their research projects. Times when StudyNet was not available due to system crashes were very rare (a matter of a very few hours over the 2 year period of the project) and students became heavily reliant on it always being available for them.

Table 7 Using StudyNet

Using StudyNet	ID
<i>The biggest change in learning was the use of StudyNet, anything you want basically to do your course was on it, it has been so helpful.</i>	44
<i>I feel Study Net is a great inspiration in the learning process. At college if I missed a class I would very rarely get the opportunity to catch up on what I had missed (HRC)</i>	19
<i>I have made more use of the internet in terms of academic websites and journals.</i>	41

<i>Podcast [accessed through StudyNet] continues to be a great inspiration to the way I learn, I find it so helpful to listen to again and again</i>	9
<i>I would be working at 3 or 4 in the morning... regardless of where I was I could always get all my work...the ability to access the [university] network is what I've found most useful....It means at home, whatever time of day or night I could grab my files and start working.</i>	16
<i>I want to say how useful Study Net is...great resource, you don't need anything but Study Net to do your work, you can contact your tutors, it is really well organised and it's not overly fancy.</i>	18

3.6 Working collaboratively online

The students have spoken of learning to develop as independent learners but at the same time many of them were also required to work collaboratively in groups, many of which were based online through their course modules. While academic research has spoken recently of using collaborative Web 2.0 technologies such as wikis, working in groups online has generally been reported by students only from their second year of study and with a variety of methods. Although StudyNet supports discussion groups and has other collaboration tools, the students were creative about their use of a variety of different technologies to connect with each other in different locations.

Table 8 Working collaboratively online

Working collaboratively online	ID
<i>I used Google docs to compile a document with others as we contributed together online</i>	4
<i>Education wise I can keep in contact especially when we are working in groups, with people who are doing the same assignments as me. We can discuss the material for the assignment. And even work together, if it is a group kind of thing, we can do it by WebCam, voice conversation, we can just talk together, or type to each other, it's just sharing information because MSN allows you to send files from your computer, so that really facilitates a lot of group assignments.</i>	31
<i>One of the group members was not able to make it today so what we did we were connected by using MSN messenger so we were discussing notes. We were feeding back to the other person.</i>	3
<i>If there was a question I couldn't do and found no useful material on I used Windows Live Messenger (instant messenger program) to discuss that particular question with my friends.</i>	19
<i>I used the class discussion feature on StudyNet to ask for help on a few of the questions I could not grasp but someone already had the same problem as me so I just read through the thread they had posted.</i>	19

3.7 Students' increasing dependence on technologies for learning

Students reflected on the changes they had noticed in their use of technology for supporting their learning through the course of the project, with many noting a real increase in the amount of time they were spending online. As students matured in their learning and many moved from FE study or first year undergraduate programmes for the early diaries in May or October 2007, the later diaries record that their use of StudyNet on the whole became more strategic and students tended to use its facilities to access journal articles and papers for their final dissertations.

Table 9 Increasing dependence on different types of technology for learning

Increasing dependence on different types of technology for learning	ID
<i>My use of technology has changed dramatically over the past year, I am definitely using it more to support my learning now than I was a few months ago.</i>	43
<i>I wouldn't say it's changed as much as I have developed using it...I am becoming more dependent on it I suppose and I'm using it more.</i>	23
<i>I have used the Internet a lot more this year than I did last year, especially for finding more academic research. Such as journals, I've learnt how to use Google scholar, which I didn't even know existed until I came here.</i>	4
<i>I've been using a lot more journals and journal articles for research data to support the books that I have been using that I get from the library. I can access it wherever I am via the Internet and using my computer</i>	37
<i>I think it's changed to the extent I use StudyNet more or less every day. I check my e-mail, I check to see if there is any added information that we need.</i>	22
<i>My technology for supporting learning has changed a lot in the past year, as I have learned new programs for journalism, and I stopped using the programmes like SPSS, because I don't use them any more.</i>	36

4.0 How students make use of their time

The second area of research for STROLL was to investigate how students use and make choices about their time. From the graph in Appendix 1 it will be seen that most students were registered as full time students instead of part-time but with many working part-time as well.

Where students worked in addition to studying full time, the following excerpt indicates a typical example of how a student fitted study in to a busy lifestyle.

'I have to work three shifts a week. So I work on Saturday morning and Monday evening and usually a Friday evening. I also have commitments on a Tuesday evening. Fortunately on the course we get all of Wednesday off which is great. It is just a really good chance to knuckle down with essays. I find I don't work brilliantly at home, so I go into college and in the Learning Resource Centre, where it is usually fairly quiet and you can always get a computer and you have all the resources that you need, so that is good. I make the most of personal study time within the day'. 42 (FE to HE learner)

Some students demonstrated that they were highly organised at managing their time and some reflected that they were now better organised than in their first year.

Table 10 How students organised their time and work

How students organised their time and work	ID
<i>I go to the lectures I need to, because they are fixed...So I work, about 90 minute cycles most time and I take a break before coming back to it. I try not to work for more than an hour half because I think my attention span in terms of focusing on something and any other time between. I just do something to relax and make sure I do something fun to break the mould</i>	32
<i>My general plan is that I work nine in the morning until five Monday to Friday.</i>	10
<i>I have quite a regimented timetable that I use which outlines when I am going to be in lectures I</i>	49

<i>tend to spend time in college during the day until it's time to collect my daughter from school and I can snatch some time in the evenings I tend to have my weekend free for family time</i>	
<i>I have a timetable I use this timetable to help me spread out my time and organise myself better, I always do my work first and then go out.</i>	51
<i>I think all work and no play makes a good girl cry. I think you just have to be sensible really. I think as much time you spend studying spend a bit about equal time may be a bit more...So I divide my time, roughly equally probably more time on leisure if am 100% honest.</i>	13
<i>That is how I do it... pen, back of the hand, sticky notes and computer. And big giant posters with to do lists on it and giving myself a deadline...</i>	18
<i>I think you never quite manage the time well at the beginning of when you start something because you don't know really what to expect until you're doing it</i>	10

Students with family responsibilities found that online access in the evening was invaluable for helping them in their studies.

Table 11 Students with family responsibilities organised their studying in the evenings and weekends

Students with family responsibilities organised their studying in the evenings and weekends	ID
<i>I have to run a house and organise three kids and organise myself so I have to be fairly disciplined with how I use my time. I still need to find time to do my studying and all the extra work that's required for that in terms of assignments that become due. I do prioritise my time well and I try and make it so that I work fairly much a 9 to 5 during the week as much as school permits anyway so that I can have my weekends free. I do do some work in the evenings</i>	49
<i>I dedicate my study time to night time when the kids have gone to bed I start to study between nine in the evening and midnight.</i>	47
<i>My children helped me download podcasts and record them so I can listen to them in the car on my way to university</i>	9

Many students reported using StudyNet extensively outside the Monday to Friday 9-6 'working week', with many of them using it as an information resource, in addition to joining discussion groups. Access off-campus even for those whose programmes were taught on-campus was valued very highly.

Table 12 Accessing information online when off-campus

Accessing information online when off-campus	ID
<i>I would be working at 3 or 4 in the morning... regardless of where I was I could always get all my work...the ability to access the [university] network is what I've found most useful....It means at home, whatever time of day or night I could grab my files and start working.</i>	16
<i>Well I used the internet looking for where the office of my tutor is and I also used StudyNet to check my journals, to find out what I needed to show my lecturer today.</i>	13
<i>e-books on Voyager has been very useful when I haven't been able to get to library and I can get them online and for my dissertation</i>	10
<i>Have been using Word all day and I've been using J. store journals. I've been using Google - best place ever. I've been using Stanford Encyclopaedia, which is online. I think life would be easier if the lot of the books that we had to read up were available online.</i>	7

<i>I think I probably knew what MSN was in my first year but didn't use it. Not until probably the third year for transferring files back and forth, arranging group meetings and checking up with each other how others part was going.</i>	45
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5.0 Students' use of e-learning tools to support learning

The third area of research for the STROLL project was the use students made of e-learning tools to support their learning. As mentioned above the learners at Hertfordshire had high expectations about the availability of and use of e-learning through the University's provision of StudyNet. They were all being taught on campus-based programmes, although some of them were out on work placements during the recording of one or more of their diaries for STROLL. Students reported a high motivation for engaging online with their learning and used various technologies to support their learning whether on placement or not. Students' use of technologies encompassed both the formal choice of tools such as general use of StudyNet which has already been well-documented above and their own choice of personal tools for learning. Questions in the diaries asked students to identify the technologies provided by the university that were their favourite and to give a reason.

Table 13 Favourite use of technology to support learning provided by the university

Favourite use of technology to support learning - provided by the university	ID
<i>I would say the one technology I couldn't do without is probably StudyNet because that's the only place you can find out everything about your course and all of my modules and what's going on and it's the way that my tutors contact me as well so it's probably the most useful thing that I have for my study.</i>	36
<i>[It's] because of the variety of areas to StudyNet like class discussion, the fact that you can find lecture slides and tutorial material on StudyNet as well</i>	8
<i>StudyNet. It's really, really good because if you missed a lecture you'd find lecture notes on StudyNet or...if you had a really, really burning question that you can't get hold of tutors or any friends you could use the discussion site. That was really, really good and often tutors would sort of pop into the discussion site and see what people were talking about and if people were worried then they would set it right</i>	46
<i>Voyager. Without a shadow of a doubt Voyager[Library system]. That thing is the 'nuts'. Being able to get those journals and articles whatever you want and being able to request journals and articles that the uni doesn't have</i>	16
<i>StudyNet was massive and great help</i>	41
<i>I check my university emails and my StudyNet everyday</i>	12

There was a high preponderance of students mentioning their computer or laptop and the internet as their favourite technology, with students mentioning StudyNet for supporting their learning. There was an eclectic use of small technologies that they perceived to be valuable and their favourite personal technologies at the time; such as USB data sticks, Dictaphones and mp3 players including iPods which were all used to support learning.

Students demonstrated that they were avid users of technology for informal social purposes outside the classroom. Keeping in contact with friends was perceived as very important for them and all had a mobile phone.

Table 14 Informal use of technology for keeping in contact

Informal use of technology for keeping in contact with students and academics	
<i>MSN is equally useful for both recreational and functional purposes, it is free which is an advantage over mobile phones and people can talk wherever, which overcomes geographical difficulties which might occur in real life meetings or conversations</i>	26
<i>I tend to check Facebook more because there is more information on there and keep a class communication with each other rather than tutors communicating there, because I communicate with my tutors through hotmail</i>	44
<i>MSN messenger - I use that a lot mainly I need to keep in contact with friends</i>	10
<i>The biggest change is that there is a larger amount of communication via e-mail between myself and lecturers. I never used to ever need to use email.</i>	18
<i>I think I probably knew what MSN was in my first year but didn't use it. Not until probably the third year for transferring files back and forth, arranging group meetings and checking up with each other how others part was going</i>	45

There was a growing maturity in many students' use of e-learning tools over the period of the project, recording their increasing use of materials such as on-line journals rather than earlier widespread and blanket use of Google and Wikipedia for searching. As recorded above there was some use of Google Scholar and some still admit to using Wikipedia as a first port of call and then delve into journals. These do tie in with the outcomes of another study for JISC, known as the 'Google generation study' (Maidment-Otlet 2008) which pointed to an apparently easy but somewhat superficial engagement with technology for learning which did not necessarily support an in-depth engagement with their learning; 'internet research shows that the speed of young people's web searching means that little time is spent in evaluating information, either for relevance, accuracy or authority' p12. The comments in STROLL pointed to a growing sophistication in students' use of search tools.

Table 15 Use of search tools for supporting learning

Use of search tools for supporting learning	
<i>I now use a lot more research, and a lot more data from research journals and journal writing. I don't use books in my assignment so much anymore, I tend to use evidence-based research</i>	58
<i>Google is the wonderful thing which wasn't around 20 years ago when I was first involved in further education and it just eases the research which you can never imagine if you had never had it before. (HRC)</i>	41
<i>Wikipedia. And I don't mean it in a bad way and I certainly don't use it to reference any of my essays or assignments or anything like that but it's very good if you are starting out on the subject.</i>	15
<i>I have started off using the odd book and a journal article here and there and progressed. Just to use more books and more journals and to react more, probably towards the latter part of my degree I spent a lot more time in the LRC which is the big change.</i>	11

The confidence of the students in using technology varied as indicated above but there was a certain determination to be online and to make best use of the opportunities for learning,

with students reporting enthusiastic use of podcasts and video casts or ‘vodcasts’ from seminars and lectures in some programmes. These were posted online by academics.

Table 16 The importance of technology in students’ lives

The importance of technology in students’ lives	
<i>Technology is a big part of my life, both in working and playing the first thing I do in the morning is to switch on my TV and my computer because I have to check my e-mails</i>	26
<i>I wouldn’t say it’s changed as much as I have developed using it...I am becoming more dependent on it [technology] I suppose and I’m using it more.</i>	23
<i>I would say that I am getting to use more and more technology and I am relying more and more on technology in this past year...I’m getting inseparable without technology.</i>	6
<i>Well technology before in the last year, I’ve basically used just to do the work now. I am using it to find out how to do the work because the way I am finding how to do the work now</i>	48
<i>Podcast continues to be a great inspiration to the way I learn, I find it so helpful to listen to again and again</i>	9

6.0 Personal technologies to support learning

The fourth area of research interest for STROLL was the use made by students of their personal technologies to support their learning. Students reported personal ownership of a wide range of technologies for learning and for leisure. For some technologies such as mobile phones and mp3 players/iPods there was an overlap between their use for learning and for leisure. Personal ownership of a laptop or computer was high, as recorded in Appendix 1. Small personal technologies were popular as mentioned above.

Table 17 Students’ use of personally owned technologies to support their learning

Students’ use of personally owned technologies to support learning	ID
<i>My own laptop. Without it personal research would have been a lot more difficult because I would have had to spend most of my time at the library, whereas having something of my own at home allowed me the flexibility I needed really.</i>	23
<i>Well if there’s one piece of technology that I could absolutely not do without it would most probably have to be my laptop or just a computer because I didn’t have a laptop in my second year and it was difficult for me because I wasn’t living on campus I live fifteen minute walk away.</i>	20
<i>Mobile phone helped me stay in touch with all my lecturers and my fellow students. It was a very simple way for me to find out information, organise study sessions, organise personal tutorials and just generally stay in touch with my fellow students just to see how they are,</i>	58
<i>Technology that I have used to support my learning has changed in the last year. It is basically the same i.e. using a Mini Disc recorder, but I also now use pod casts as well, quite frequently.</i>	17
<i>My Dictaphone, which I use when I’m conducting interviews for journalism, which is very very useful. I can record conversations that I have had and interviews and then I can use that to write up an article and make sure I get the facts right</i>	36

<i>My MP3 player, I use it every day, if I was to download pod cast or something I can listen to it on the go,</i>	20
<i>The Mini Disc and laptop are only ever used for revision and learning and the PC iPod and mobile are all used for a mixture of both learning and relaxing</i>	17
<i>This lovely graphical calculator, which I had supplied by university for my course. It does everything I need it to. I can write programs to help me, working out stuff like trying to do simplex algorithms.</i>	16
<i>I depend on my phone, because it has an organiser application so I use this to schedule and structure my day and to list any important things I had to do that day. And I can access the Internet using my phone, but slower so I prefer to use the computer rather than my phone.</i>	43
<i>My mobile phone, my great Samsung ... I wouldn't leave my room without it. It helps me because it has got a large memory capacity. I find it extremely useful, because I can record a whole hour of lecture and seminar (HRC)</i>	28

Students accepted without voicing any complaint the fact that they expected to use their own technologies to access their learning instead of relying on the provision by the university of all the technology. This included one student buying a Mac computer instead of a PC. Many students noted their high use of USB memory sticks for data. Others commented on the usefulness of watching television to supplement their learning especially Law students who reported watching Prime Minister's Question Time and another student who watched the Discovery Channel for legal cases.

Those students whose programmes required specific technical skills often had a wide range of personally owned technology such as students studying Music Technology:

'I have a keyboard here, which is connected to this Mac and the programme, which is on a Mac right now is logic, which is what I'm using for my coursework. Also I have a mixer, which is connected to my speakers, which is connected to this other computer, which I am doing my recording on right now as you can see, I also have a mini keyboard for this computer, and I have my mike and headphones and stuff, which is all connected to the main recording Suite, which is my Mac.' (21)

7.0 Conclusions

In this paper the STROLL research team have presented their findings under the main headings of their research questions. In conclusion from an overview of the project we suggest that students are using all sorts of personal and institutionally provided technologies to support their learning at the University of Hertfordshire. These included those technologies that might be expected, such as the MLE, StudyNet which is extremely popular with students and those which were not expected such as the use of mobile phones to record lectures and seminars. The ubiquity of technology use and the breadth of ownership should not come as a surprise given the current background of research into

students' uses of technology e.g JISC Mori polls in December 2007 and July 2008 and the ECAR study (Caruso and Salaway 2007)), which highlighted how familiar the new generation of students is with using technology for accessing their learning and leisure. All the STROLL students owned a mobile phone and 74% owned their personal computer or laptop.

It has been suggested that students nowadays tend to adopt a shallow and superficial attitude to searching for materials and using technology. Our findings indicate that as students mature in their learning and their general use of technologies through their undergraduate career they generally adopt more careful strategies for planning and managing their time and for determining how they are going to retrieve and use information to support their learning. An example of this is the widespread use of searching for journal articles online to support their research assignments.

Students use their online social networks to keep in close contact with their fellow students, often several times a day. There is some evidence for the use of social networks such as Facebook to support their learning but the boundaries are not drawn sharply and students on different programmes choose different ways to communicate and keep in touch with each other and academics.

In terms of the differences noted by students during their learning journeys, the variety of types of technology and the importance of an MLE to support learning at Hertfordshire especially when off-campus are mentioned as significant. In this set of students the differences were not recorded as problems but points of change and growth. At Hertfordshire the students were successfully moving on from either 1st year or later undergraduate to 2nd/3rd year of study or from successful completion of a Foundation degree to complete their Honours programme. Knowing that they have already managed the transition to higher level study brought confidence to many of the students, and none expressed concern that they might not be able to manage with new technologies in the future. The positive 'can do' attitude noted in these students may be due to the ready availability of technical support alongside easy access to on-line learning. The more mature students in the STROLL group of participants i.e. those over 25 at the start of the project did not let their lack of prior experience with technology deter them in their studies. They found the support they needed either informally from friends and family or through the institutional facilities for support and online help such as the popular i-Spy guides. One student in his late 20s reported never having had access to a personal computer before starting his course but had embraced using technology to support his learning with great enthusiasm. The oldest student in the project was aged 51 and she had used her children to solve her technology and access problems but two years later at the end of the project she reported how much more confident she felt as a graduate using a variety of technologies.

How did the project benefit the students taking part? An extra and unexpected outcome from the diaries was the developing reflections that the students recorded and their relaxed attitude in front of their webcam or camcorder or in their voice recordings. The amount that

the students recorded increased on each successive set of diaries as they became accustomed to the mode of recording and the nature of reflection. The total number of pages transcribed and analysed for the diaries was in excess of 790 and the diaries overall provided a wonderfully rich source of personal reflections. Many of the students had not realised before they started the STROLL project just how much time they spent day by day using technology for learning or leisure and how access to the internet dominated their lives. One of the students commented in his first diary how it had helped him as a person to reflect on his use of time and his use of technology and that the exercise of recording the diary had been an unexpected bonus for him to understand his own working patterns. In an informal review of the findings with students at the end of the project this was also commented on by other students.

The main achievement of this project is the unique set of diary transcripts and the related summary mind maps which record the students' quotes from their answers to the research questions available at (<https://mw.brookes.ac.uk/display/JISCle2>) and which have been summarised in this paper. The STROLL project findings will be of use in Higher Education institutions to assist technical support and academic staff and to help to inform strategy decisions in the use of e-learning technologies for HE. Given the small amount of prior research into the use of video diaries with HE students, it is hoped that the methodology developed by the STROLL team will also provide guidance for future projects.

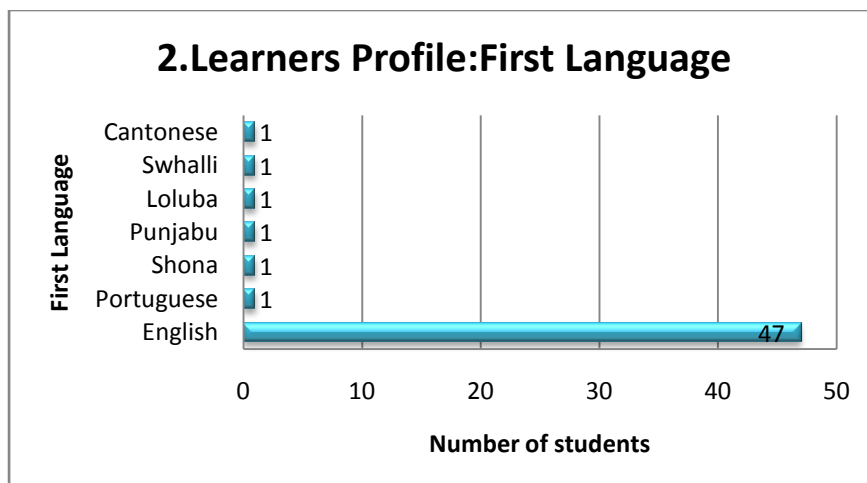
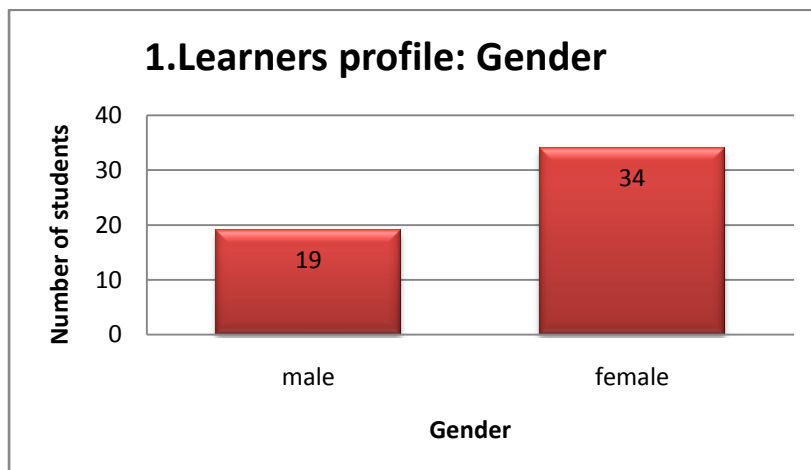
The outcomes of this longitudinal study provide a unique view of learners' changing uses of technology at a time of rapid change, highlighting students' personal growth and maturity in making decisions about using e-learning tools. In closing, the project team would emphasise that it is carefully chosen pedagogy that should inform the students' learning and not just the provision of technology, however supportive and time-saving this may prove to be to the students. Our students lead complex and connected lives, but we suggest that their learning should be assisted by the technology provision and not driven by it.

Appendix 1 Graphs from the Learners' Profiles for STROLL Students

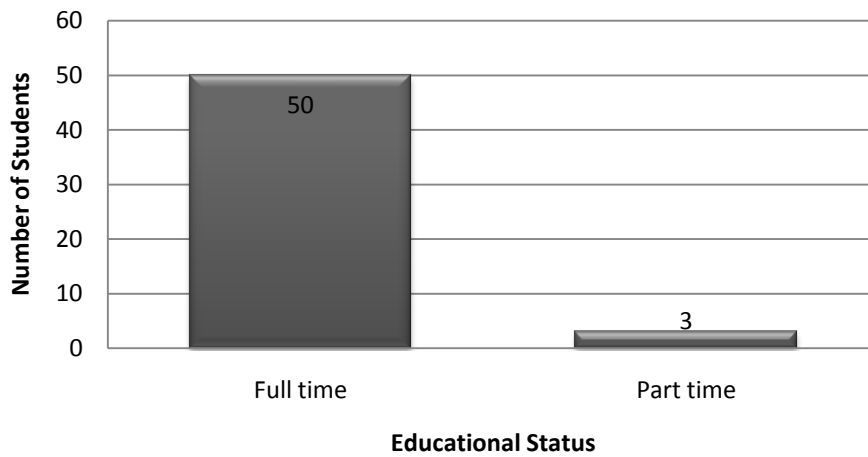
Note: The total number of students taking part in STROLL over the 2 years of the project was 54. Not all students completed all 4 diaries. Most students completed most sections of the profile document but some opted out hence the difference in numbers in the graphs below.

List of graphs

1. Gender of participants
2. First Language
3. Educational Status
4. Employment Status
5. Ethnicity of STROLL participants
6. Frequency of use of a computer
7. Main place of study
8. Access to a networked computer
9. Accessing personal technologies at my place of study
10. Technology I own and use
11. Technology I have experience of using



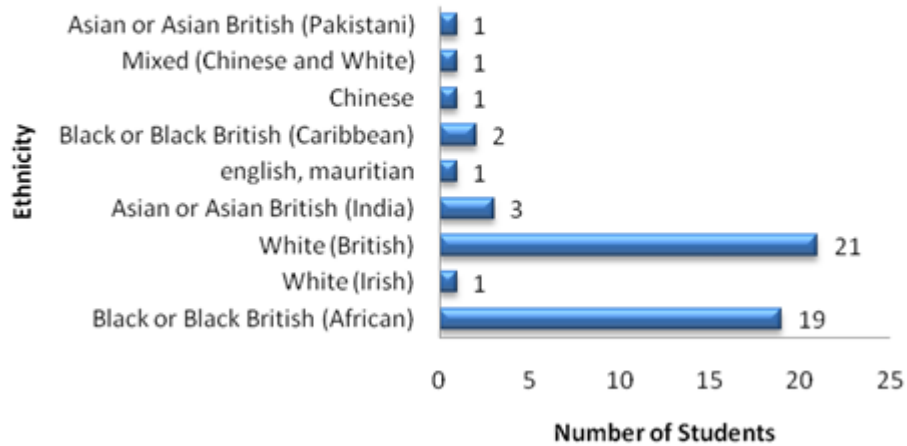
3. Learners Profile: Educational Status



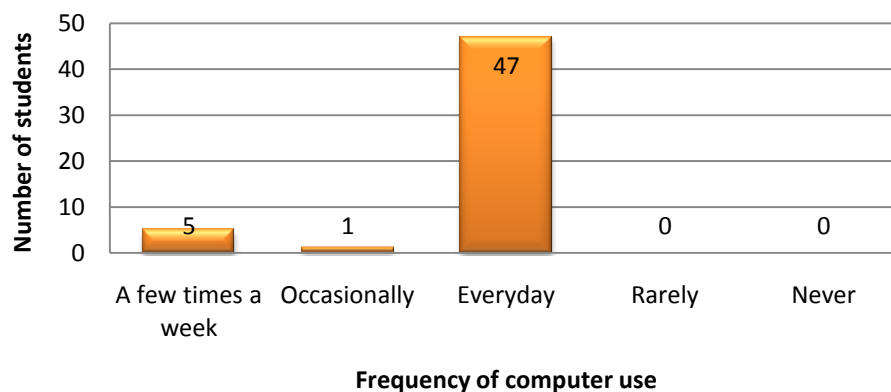
4. Learners Profile: Employment status



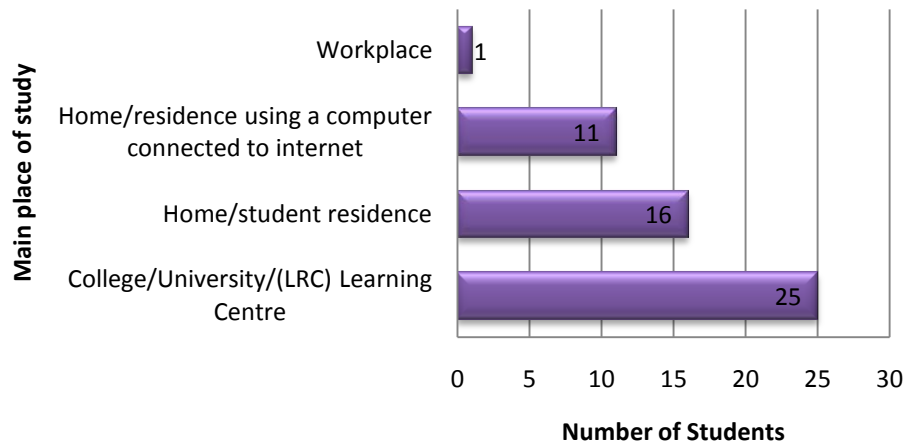
5. Ethnicity of Students on STROLL project 50/54



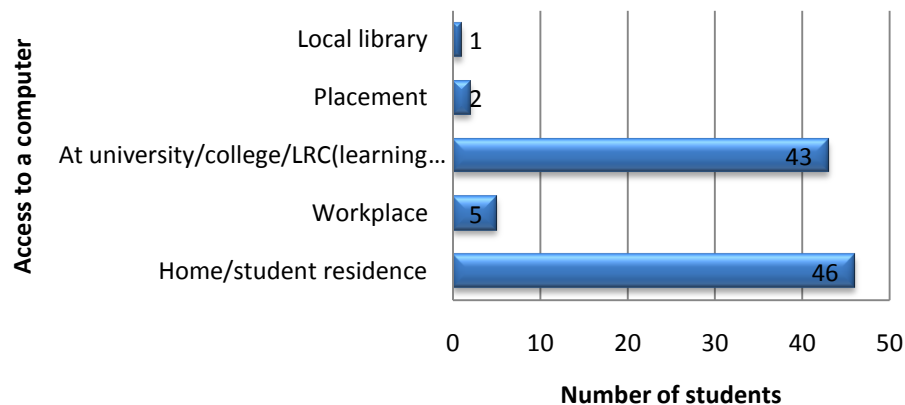
6. Learners Profile: I normally use the computer...



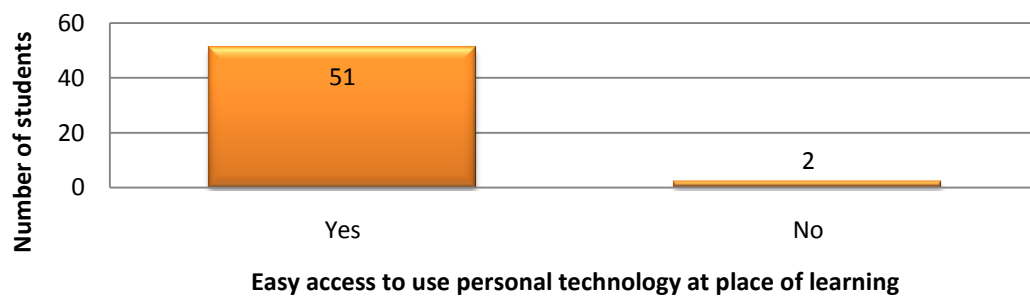
7. Learners Profile: Main place of study



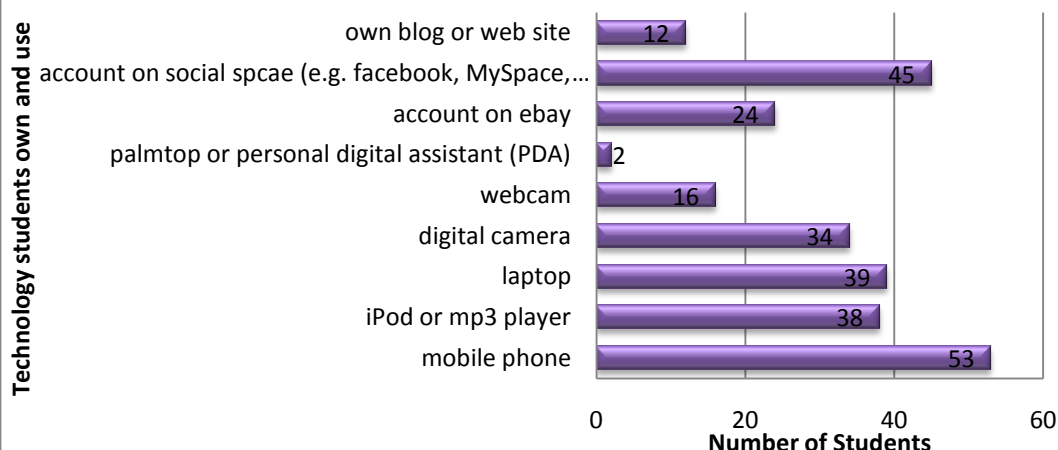
8. Learners Profiles: I have access to a networked computer ...



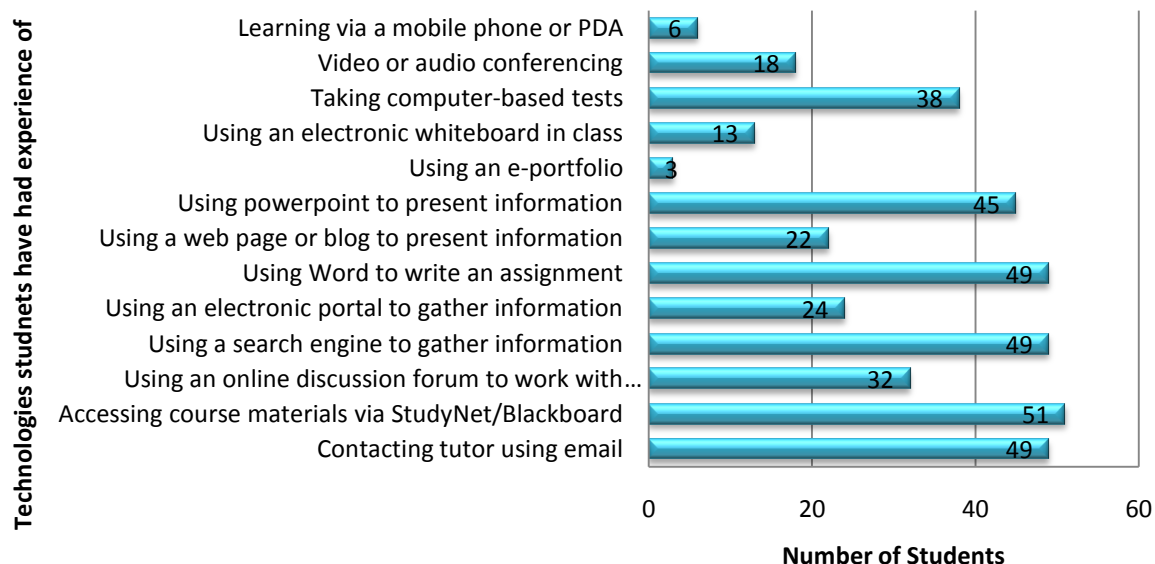
9. Learners Profile: I find it easy to access/use my own personal technologies at my place of learning:



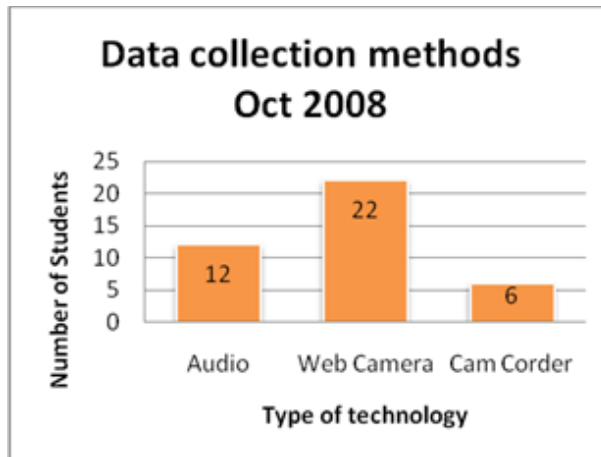
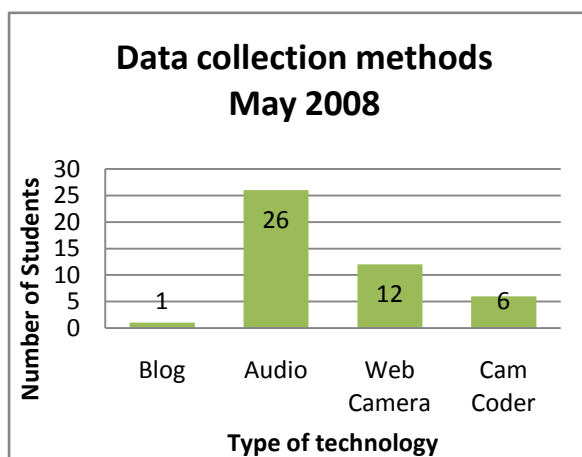
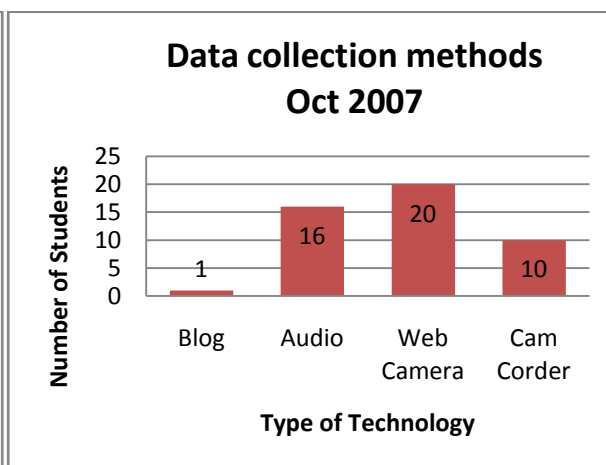
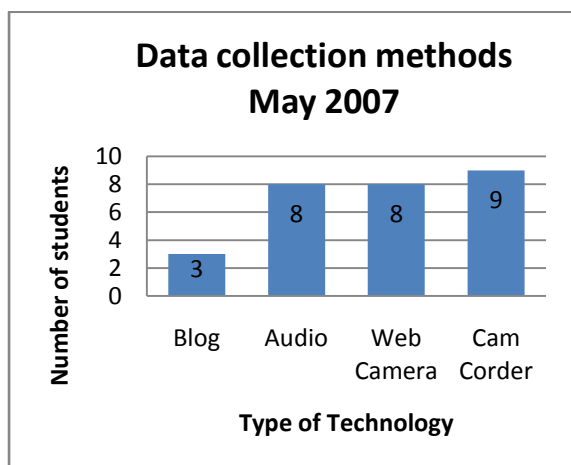
10. Learners Profile:I own and use the following:



11. Learners Profile:As a learner,I have experience of:



Appendix 2 Data collection methods for the diaries May 2007 to October 2008



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