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A Survey of Undergraduate Technology Use and Attitudes

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Introduction

This study has provided an opportunity to continue our long and successful collection of information about how our students view ICT at the University of Edinburgh. The original work started in the 1990s. At that time, the University was concerned to increase its use of computer-based approaches in teaching and learning, but those involved soon became aware that such developments would require to be predicated upon the existing patterns of experience and attitude, both of staff and students, with regard to computers and information technology. At that time, very little was known about the levels of technological literacy that students brought from their secondary schools experience. The collection of some basic data provided the foundation necessary for the institution to develop its early policy and strategies on information technology literacy, and on the use of technologies in support of teaching and learning.

Things change very quickly in the domain of information technology, and we have needed to return to this data collection exercise on a regular basis. In the early years of these developments, survey data were gathered initially annually, and then latterly biannually. These data were easily collected by paper questionnaires distributed, and collected, as students passed through the tedious process of enrolment and matriculation at the beginning of each academic year, and return rates of 70 to 80% were easily achieved. Happily, in recent years, technologies have helped to streamline these processes, and students no longer have to stand in long queues in which the opportunity to complete the odd questionnaire might be seen as a blessed relief. It has thus become more strategically difficult to gather theses data at a university-wide level. Online data collection has been tried (and we have made successful use of this approach as part of this present study) but extremely poor return rates have been seen in such centrally administered, voluntary, surveys. It seems therefore that the only way to gather a sample of responses that is representative of the student body as a whole is to go out into the university community and approach people directly, in a setting where they might have some time on their hands, with a paper questionnaire. This has been the approach used in part of this study.

The Survey

A copy of the survey questionnaire is included as Appendix A. In part, the structure of the questions posed follows the pattern established in the surveys of the early 1990s, so as to allow the potential for comparison. For example, the questions about attitudes towards, and the perceived value of, the application of technologies in teaching and learning, follow closely the wording of the questions used in earlier surveys. We have also asked very basic questions about ownership of, and access to, computing equipment. On the other hand, many questions are highly topical, asking about ownership of particular personal technologies, and about the students' experiences of the use of online "social networking" applications such as *Facebook*, for both personal and academic purposes. It was felt important, with response rate in mind, to limit the length of the questionnaire, and in the end we confined the question set to two sides of one A4 sheet of paper.

In addition to the questions about technology, we asked respondents to tell us their gender, age group, year of study, and the University School in which they were enrolled.

Data Collection

Two routes to data collection were used in this study. As indicated above, we saw no alternative for the vast majority of University students to going out into the community and engaging directly with student colleagues to invite them to complete the survey. The approach was therefore to employ postgraduate students to staff a number of data collection points over the course of one day, and to actively approach students who were collecting in, or passing through, the area, and asking them to complete the survey. Three locations were identified in the Central Area of the University (the Student Centre in Bristo Square, the Student Union, and the concourse of the Appleton Tower which both has a café, and is proximal to a group of large lecture theatres) and two locations at the University's Science and Engineering King's Buildings Campus (again the

Student Union, and a recently refurbished café and student area in the James Clark Maxwell Building). Our graduate student assistants were encouraged to be proactive in approaching their undergraduate colleagues with the request to help in the completion of the questionnaire. We are grateful to colleagues in the Student Association for their advice in identifying suitable data collection sites, and for their help in providing space, and tables, for our assistants to work from.

Before conducting this study we had to obtain permission from a central panel which monitors such data collection and survey exercises with the student body to ensure that they are not subjected to too many such intrusions on their life and work. These colleagues were supportive, while requiring that we should only survey first and second year undergraduate students. This constraint was imposed as the University was concerned actively to promote the engagement of final years students with the National Student Survey[1], and therefore did not wish these third and fourth year students to experience any other intrusions which might make them less inclined to respond to this nation-wide survey exercise. We therefore instructed our research assistants to gather responses only from the first and second year undergraduates, and we prominently displayed posters at our data collection sites which made the target group clear. Despite this, one or two third and fourth year students did slip into the sample. For purposes of the analysis (below) however, we have excluded them, and report analyses only of those students in undergraduate years one and two.

Collecting data from our students in the College of Medicine and Veterinary Medicine provided a different set of difficulties and opportunities. Medical students spend most of their time at the Medical School facilities based at Edinburgh Royal Infirmary, with the Veterinary Medicine students based to the College's facilities at Easter Bush outside the city. There is however, a powerful tradition within the Medical and Veterinary Medical Schools of using the College's Virtual Learning Environments (VLEs) not only for access to learning materials and to the programme organisational information, but also for the elicitation of information, and course evaluation comment, from the student group. Our College colleagues advised us that we could expect successfully to use a Web-based route to the collection of data from College undergraduates via the College VLEs, and assisted us both by mounting the survey within their systems, and by encouraging their students to complete our survey. We therefore have a particularly high response rate from the students in this College, as compared with the other two Colleges.

The Sample

Table 1 shows the distribution of student respondents over the first and second undergraduate years. Overall, we have 580 valid responses contributing towards the overall analysis.

	Frequency	Percent
1st year	322	55.5
2nd year	258	44.5
Total	580	100.0

Table 1; year of study

Table 2 shows the age-group distribution of these students. Nearly 97% of our student respondents are 25 years old and younger.

[1] http://www.thestudentsurvey.com/

	Frequency	Percent	Cumulative Percent
16-20	484	83.6	83.6
21-25	77	13.3	96.9
26-30	13	2.2	99.1
31-35	5	.9	100.0
Total	579[2]	100.0	

Table 2; age distribution of student respondents

Table 3 shows the gender distribution of the overall group. Gender is more meaningfully explored alongside College membership however, as there are predictably more men than women in the College of Science and Engineering (CSE), but more women than men in the Colleges of Humanities and Social Science (CHSS), and in Medicine and Veterinary Medicine (CMVM). This breakdown is shown in Table 4.

	Frequency	Percent
female	357	62.0
male	219	38.0
Total	576	100.0

Table 3; gender of respondents

		Gender of respondent	
		female	male
College Membership	Humanities & Social Science (CHSS)	78	37
		67.8%	32.2%
	Science & Engineering (CSE)	47	66
		41.6%	58.4%
	Medicine & Veterinary Medicine (CMVM)	208	105
		66.5%	33.5%

Table 4; gender distribution of respondents as a function of College membership

At this point we should also consider the overall response rate in this study. It is clear that this modest survey represents a very small proportion of the undergraduate population of the University. At time of writing, there are just under 19 thousand undergraduate students (full- and part-time) enrolled in the University of Edinburgh[3]. The 580 response rate amounts therefore to only about 3%. Considering this at a College level, we can be seen to have sampled 1% of students from CHSS, 2% of those from CSE, and around 13% of those from CMVM. This very much higher proportional return from CMVM can be explained by the support at the College level to gather data through the College's own Virtual Learning Environment (VLE); a possibility which didn't exist because of the relative heterogeneity of the other two colleges.

The return rates seem slightly better when one considers that we were actually sampling from only approximately half of the overall student population (by confining ourselves to undergraduate years one and two.) Given our approach to data collection however – sampling from a "snapshot" of those students coming through a small number of specific locations on only one day – we feel pleased by the return. We would further observe that we see no reason to think that the sample that we have drawn would be systematically

[2] One of the students failed to provide a response to the age-group question, and so the number for analysis is one less than the 580 of the entire group. Loss of data through non-response to any given question has proved only to be a minor problem for the data collection. In some cases it will be seen that the total number of respondents reported upon will be less than the overall total of 580. Unless otherwise indicated, this is due to small numbers of cases for which a response to a particular question was found to be missing.

[3] http://www.ed.ac.uk/schools-departments/governance-strategic-planning/facts-and-figures/university-factsheet

biased in an important way. In this latter regard, it is worth considering the gender ratio of our group however. Overall, 62% of our sample are women, with 38% being men. This corresponds to an overall undergraduate gender ratio of 56% female to 44% male. The women are therefore slightly overrepresented in our sample as compared to the general University population. The reader should bear this source of bias in mind in interpreting the analyses that follows. A slightly higher proportion of female respondents is not surprising however, as it is commonly found that women are more generous with their time in responding to such an elective survey opportunity.

Table 5 shows the source of the survey responses. We know absolutely that the data collected online come from the sources to which they are attributed. Those responses gathered at the King's Buildings have almost certainly come from the CSE population, while there are likely to be a small number of CSE and CMVM students caught up with the predominantly CHSS group gathered in the University's Central Area around George Square.

	Frequency	Percent
King's Building	66	11.4
Central Area	205	35.3
Medical School (online)	254	43.8
Vet School (online)	55	9.5
Total	580	100.0

Table 5; sources of the questionnaire responses gathered.

Table 6 shows the overall return rates broken down by college membership.

	Frequency	Percent
Humanities & Social Science (CHSS)	115	21.1
Science & Engineering (CSE)	113	20.8
Medicine & Veterinary Medicine (CMVM)	316	58.1
Total	544	100.0

Table 6; responses from the three colleges

The Students' Responses

The first question that we asked the students in the questionnaire was about their confidence in technology-related demands with which they had been faced so far, or expected to be faced in the future (Table 7). This shows a reassuring picture, with around three quarters of the group declaring themselves to be entirely confident, or looking forward to the challenge they faced. This still does leave a significant group for whom the expectation of having to make use of Information and Communication Technologies (ICTs) in their academic work does hold some anxieties. Although the student group may arrive, and continue, at university well prepared from their own informal and social uses of ICTs, they are aware that they will be asked to make use of technology in new and challenging ways in their studies. The teaching and support community must be aware of this.

	Frequency	Percent	Percent
very confident	257	44.3	44.5
enjoy the challenge	178	30.7	30.8
a little apprehensive	128	22.1	22.2
very apprehensive	14	2.4	2.4
Total	577	99.5	100.0

Table 7; confidence in ability to use ICTs in university studies

It is important to note too, that gender may be a factor in the level of confidence evidenced (Table 8). Men are significantly over-represented in the group reporting themselves as "very confident" when there are proportionately more women in the group reporting themselves to be "a little apprehensive" (Chi-square = 9.918; $p < 0.02$). This finding is in keeping with other studies of this kind, and it is important to note that we

have here a self-reported measure of confidence, rather than any objectively measured estimate of competence. It is common for men to over-estimate their ability as compared with their female counterparts, in the absence of any actual different in measured ability. Interestingly there is no evident difference between the man and the women in the number of students who use the extreme category of "very apprehensive" to describe their relationship with technology. This is a very small number in our sample, and given that small number extrapolations to the entire population are problematic. But these responses do remind us that there remains a small but significant number of students who find the imperative to make use of ICTs in their studies to be a source of anxiety. It seems likely too, and in keeping with what we see here, that those suffering from a troublesome level of technology-related anxiety are as likely to be men as women.

	Gender of respondent	
	female	male
very confident	143 40.3%	113 51.8%
enjoy the challenge	114 32.1%	63 28.9%
a little apprehensive	91 25.6%	36 16.5%
very apprehensive	7 2.0%	6 2.8%

Table 8; Confidence in ability to use ICT in university studies as a function of the gender of the respondent.

Considering the overall confidence of the student group with their ability to use ICTs in their studies, it would seem likely that this would vary as a function of college membership, and of the academic background of the students (Table 9).

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Confidence in ability to use ICT in university studies	very confident	58 50.4%	72 64.3%	111 35.4%
	enjoy the challenge	38 33.0%	23 20.5%	102 32.5%
	a little apprehensive	19 16.5%	15 13.4%	91 29.0%
	very apprehensive	0 .0%	2 1.8%	10 3.2%

Table 9; expressed confidence as a function of college membership

We might expect that the students whose academic background had led them to join programmes in the CSE would be found to be most confident. Respondents from the CMVM are the least likely of students to report themselves as "very confident" and most likely to describe themselves as "a little apprehensive" or "very apprehensive". Overall the relationship between College membership and expressed confidence is significant (Chi-square = 36.365; $p < 0.0005$).

As we have already seen (Table 4) there is a highly significant relationship between gender of the student respondents and their college membership (Chi-square = 24.112; $p < 0.0005$). The gender link with confidence remains only weakly however when one looks at the men and women within one College group; CMVM (Chi-square = 7.805; $p < 0.05$), CSE (Chi-square = 4.780; ns) and CHSS (Chi-square = 5.033; ns). When one looks at the relationship between confidence and College membership within the sub-group of women (Table 10), and the sub-group of men (Table 11), the relationship remains strong (in the female sub-group Chi-square = 21.319; $p < 0.002$; in the male sub-group Chi-square = 21.150; $p < 0.002$). The rather weaker relationship between gender and confidence is therefore likely to be primarily due to the strong relationship between academic domain and confidence, and the differential distribution of men and women across the Colleges.

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Confidence in ability to use ICT in university studies	very confident	36 46.2%	26 56.5%	71 34.3%
	enjoy the challenge	31 39.7%	11 23.9%	60 29.0%
	a little apprehensive	11 14.1%	9 19.6%	70 33.8%
	very apprehensive	0 .0%	0 .0%	6 2.9%

Table 10; relationship between confidence and college membership in the female sub-group

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Confidence in ability to use ICT in university studies	very confident	22 59.5%	46 69.7%	39 37.5%
	enjoy the challenge	7 18.9%	12 18.2%	41 39.4%
	a little apprehensive	8 21.6%	6 9.1%	20 19.2%
	very apprehensive	0 .0%	2 3.0%	4 3.8%

Table 11; relationship between confidence and college membership in the male sub-group

The students were next asked about the extent to which they felt that engagement with ICTs had been helpful to them in the academic work and study (Table 12). Happily we find that the overwhelming majority (98%) expressed the opinion that these technologies had proved "helpful", or indeed "very helpful".

	Frequency	Percent	Cumulative Percent
very helpful	413	71.3	71.3
helpful	153	26.4	97.8
not helpful	9	1.6	99.3
hindrance	4	.7	100.0
Total	579	100.0	

Table 12; perception of helpfulness of ICTs to university studies

The next set of questions asked students about their personal access to computer technologies during the period of the academic year, when they were resident in Edinburgh. First of all, we asked students if they owned a computer and, if so, of what type. Almost all or our students (99%) reported having a computer of their own. Of this group, the majority (83%) reported using some form of laptop or "netbook" device. A further 10% used both a portable device and a desktop machine, with only 7% having access only to a desktop machine. In total then, 93% of the 99% of students who own a computer are using some form of potentially portable machine. Although there are some differences evident when the data are broken down by college membership (Table 13) and gender (Table 14) these are small and, although statistically significant, of little practical import. In addition, 90% of respondent indicated that they had access to a "fast" network link in the place of their semester-time residence. We used the term "fast" connection in this context as we felt, on balance, that we did not want to distract respondents with technical terms and details that there was no pragmatic need for them to know, and that we would be satisfied with their own operational definition of "fast" as implying "fit

for purpose" in the context, or "satisfactory" for their needs. We felt that this would result in the application of a demanding criterion by the student respondents. Given this criterion, it would seem that most of our students are able to work seriously on online tasks and resources from their place of residence.

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Type of computer	a desktop machine	7 6.2%	4 3.6%	29 9.2%
	a laptop / netbook machine	87 77.0%	92 82.9%	265 84.4%
	use both	19 16.8%	15 13.5%	20 6.4%

Table 13; type of machine owned as a function of college membership (Chi-square = 15.064; P < 0.005)

		Gender of respondent	
		female	male
Type of computer	a desktop machine	20 5.6%	21 9.8%
	a laptop/netbook machine	310 87.1%	164 76.6%
	use both	26 7.3%	29 13.6%

Table 14; type of machine owned as a function of the gender of the respondent (Chi-square = 10.430; p < 0.005)

The distribution of operating systems (OS) used by the student group seems to diverge somewhat from the current statistics on world usage share. At time of writing, the median usage share for all forms of the Windows operating system was 86%, of the Macintosh OS was 7%, and of Linux 1%[4]. The student group sampled suggest a markedly higher usage of Macintosh than might be predicted (Table 15). Of course the Macintosh has always enjoyed a larger proportion of the market share in education, with less volume usage in business and commerce.

		Frequency	Percent
Type of operating system	Windows	453	79.6
	Mac OS	103	18.1
	Linux	13	2.3
	Total	569	100.0

Table 15; distribution of operating system choice

[4] http://en.wikipedia.org/wiki/Usage_share_of_operating_systems

		Gender of respondent	
		female	male
Operating system of computer	Windows	294 83.8%	156 72.6%
	Mac	52 14.8%	51 23.7%
	Linux	5 1.4%	8 3.7%

Table 16; distribution of operating system use as a function of gender

When these distribution figures are broken down by gender there appears to be a significantly greater likelihood that men will own a Macintosh machine (Chi-square = 10.977; $p < 0.005$). Considering the breakdown of OS usage by college membership (Table 17), the highest proportion of Macintosh use appears to be among students in the CHSS, and the highest proportion of Windows use in seen among the students in the CMVM. (Chi-square = 21.011; $p < 0.0005$).

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Operating system of computer	Windows	85 75.9%	81 73.0%	264 84.3%
	Mac	27 24.1%	22 19.8%	44 14.1%
	linux	0 .0%	8 7.2%	5 1.6%

Table 17; distribution of OS use as a function of college membership

Given that a large majority of our students have a laptop, or other portable computer device (Tables 13 and 14), it would be important to know whether they would be inclined to carry these devices with them to the campus. A number of University policy decisions (such as target ratios of students to University-provided computers, or the development of wireless network infrastructure) might be influenced by knowing about these behavioural plans. Overall, only 29% of students indicated that they would plan to carry their laptop with them for use on the campus. However, the picture changes somewhat when we consider the figure broken down by college membership (Table 18). Considering only CHSS, the 40% of students who say that they would carry their laptops to the campus seems like a relatively large proportion, of which the planners in the University's Information Services should take some cognizance. It is interesting to speculate why this significant (Chi-square = 13.765; $p < 0.001$) relationship should exist. Perhaps the customary daily working patterns of students in CHSS (with more discretionary time to be spent in the library, or in writing and note-taking) as compared with those students in CSE and CMVM (with more time taken up in practical and laboratory-based activities for which the equipment would be an unnecessary encumbrance, or more at risk of theft).

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Carry your laptop?	yes	44 40.0%	28 25.9%	67 21.8%
	no	66 60.0%	80 74.1%	240 78.2%

Table 18; plans to carry laptop to the campus as a function of college membership

Consideration of the gender pattern may provide some insights here (Table 19).

			Gender of respondent		
			female	male	Total
Carry laptop?	yes	Count	84	70	154
		% within Gender of respondent	23.9%	34.0%	27.6%
	no	Count	267	136	403
		% within Gender of respondent	76.1%	66.0%	72.4%
Total		Count	351	206	557
		% within Gender of respondent	100.0%	100.0%	100.0%

Table 19; plans to carry laptop to the campus as a function of gender

Overall, the men are more likely to carry their laptops to the campus (Chi-square = 6.553; $p < 0.01$). Broken down by colleague, there is no gender difference found in CHSS (40% or women and 39% of men), a small but non-significant difference in CSE (17% of women and 32% of men), and a similar pattern in CMVM (17% or women and 30% of men) which reaches significance because of the larger sample size (Chi-square = 6.585; $p < 0.01$). Evidences from our surveys over the years have suggested that the presence or absence of a gender effect in our data can be a sign of the status of a particular skill or practice in the academic lives of our students. In the early to mid 1990s we would expect to find highly significant gender differences in the extent to which students indicated their engagement with a range of computer-based activities, such as using a word processor, an electronic mail client, or a Web browser. As these various activities became a mainstream part of the academic experience gender differences were found to disappear, and by the year 2000 most had disappeared entirely; first the gender difference in the reported frequency of use of the word processor, followed by the use of email, and finally browsing of the web. Following the line of argument which holds that gender differences disappear when a practice reaches the pragmatic mainstream, we might suggest that the absence of any sign of a difference between the men and the women in the CHSS in the reported likelihood of their choosing to carry their laptop devices with them to the campus might mean that the working patterns of this group of students is coming to be positively enhanced and supported by their having the computing devices with them in class, and in the library. This hypothesis would bear further, more in depth investigation by talking directly to students about this behaviour.

Finally on this theme, a puzzling, though statistically significant relationship exists between the OS that a student chooses and the likelihood that they will bring their machine to the campus with them (Table 20; Chi-square = 43.788; $p < 0.0005$). This relationship may in part be due to the higher levels of Macintosh use in CHSS, and the higher likelihood of CHSS users to be carrying their laptops. However, restricting the analysis to those students in CHSS, the relationship between choice of machine and behaviour pattern is even stronger (Chi-square = 20.041; $p < 0.0005$) with nearly 80% of Macintosh users choosing to carry their machines with them to the campus. It may be that there is something about the working patterns of certain students that makes this association relevant.

		Carry laptop?	
		yes	no
Operating system of computer	Windows	23	57
		28.7%	71.3%
	Mac	21	6
		77.8%	22.2%

Table 20; plans to carry laptop to the campus as a function of the operating system used by the respondent

The questionnaire next asked the students to indicate their level of confidence in their ability to perform some basic technical task. We asked them to indicate this on a three-point scale from “can do this alone” through “would need help” to “never done this”. We also added a “don’t know / not sure” category, as we felt that some respondents might genuinely not understand the question, and so would be reassured by the possibility of this category. For our analysis purposes, this final category would represent a fourth point on a scale, implying lesser competence in that given task domain. There questions can broadly be divided into two groups; the first (Table 21) relate to general maintenance of the computer and its operating system, and the second (Table 22) asks about competence with some specific software tools relevant to the academic setting.

Considering Table 21, it is reassuring to think that around two third of the group felt able to perform these basic maintenance tasks on their own. On the other hand, the idea that nearly 20% of the group as a whole had never taken any steps to backup their machines is rather worrying. As those involved with the support of students in the use of ICTs, we have encountered circumstances in which significant system failures have resulted in the loss of data which have not been backed up. Anyone who has been involved with the reception of students' work for assessment will be familiar with the excuse that a "file was lost" being offered as an explanation for a late submission.

	backup	anti-virus	update
I do this type of task alone	60.4%	63.6%	62.1%
I would need some help to do this type of task	15.5%	24.0%	22.4%
I have never done this type of task	18.8%	8.9%	11.4%
don't know / unsure	5.4%	3.5%	4.1%

Table 21; reported technical competence; the computer system

Table 22 summarises the responses to our questions about the students' perceived confidence in the use of a number of generic, and academically relevant, software tools. A high proportion seemed entirely confident in their ability to use a presentation manager (tools such as Microsoft's *PowerPoint*, or Apple's *Keynote*). Many students are familiar with such tools from their school experience, and asking students to prepare small presentations for tutorial or seminar classes is an increasingly common academic task, even in the early years.

It is more worrying that around 30% of our students do not appear familiar with the use of a bibliographic database. In general students appear markedly more confident with the business of generic Internt searching, than with the specifics of using a bibliographic database. If the data are broken down by the year of study of the respondents there is little difference between the levels of confidence expressed by the 2nd year students as compared with the 1st year students, save in the case of the use of bibliographic databases (64% in the case of the 1st year students indicating that they can "do this type of task alone", but 76% in the 2nd year group).

	presentation tool	bibliographic database	Internt search
I do this type of task alone	91.0%	69.3%	83.9%
I would need some help to do this type of task	6.4%	22.2%	11.4%
I have never done this type of task	1.7%	5.5%	2.3%
don't know / unsure	0.9%	2.9%	2.4%

Table 22; reported technical competence; the software tools

Looking at the data broken down as a function of the gender of the students, it would seem that the men are more likely to feel themselves competent in the areas of systems maintenance, but not in the areas of academic applications of the technology (save for a slightly higher proportion of the men believing themselves to be individually competent in Web searching).

We next asked students about the frequency with which they accessed a number of centrally provided academic Web facilities. *MyEd* is the University's Web portal service, by which both students and staff can get access to a range academically relevant resources, such as the Virtual Learning Environment (VLE), or information from the student record. Students can, for example, access information about their academic progress and grades, or update information about their address details.

	Frequency	Percent	Cumulative Percent
on a daily basis	375	72.3	72.3
on a weekly basis	69	13.3	85.5
regularly, but less frequently	37	7.1	92.7
rarely, or never	38	7.3	100.0
Total	519	100.0	

Table 23; frequency of use of the *MyEd* University Web portal

The finding that around 85% of the group are accessing *MyEd* on a weekly basis or better would seem encouraging. Although it can be seen that quite a number of the 580 respondents did not answer this question, so the proportion may not be as healthy as it, at first, appears. Although these numbers mask different patterns of behaviour of students across the three colleges. It might be argued that the use of the *MyEd* portal is less relevant to students from CMVM as they have their own Web-based systems and processes. When one looks at these data broken down by college membership one indeed finds that students in CMVM are having less need to access MyEd on a daily basis (58%) as compared with CHSS (89%), and CSE (86%).

We see another college-specific pattern when we look it the use of the VLE as a function of college membership. Nearly 97% of students of CMVM access their college-specific VLEs on a daily basis. This shows the degree of embedding of the Web-based practices in the lives and work of the students in that college. Daily use of the VLE is reported by 74% of students in CSE, but by only 51% of students in CHSS. This is very much in keeping with what we know if the penetration of online learning support across the three colleges. Thirty eight percent of students in the first two years of CHSS report making use of the VLE "rarely, or never".

	Frequency	Percent	Cumulative Percent
on a daily basis	467	80.9	80.9
on a weekly basis	23	4.0	84.9
regularly, but less frequently	11	1.9	86.8
rarely, or never	76	13.2	100.0
Total	577	100.0	

Table 24; frequency of use of the University VLEs

A very different pattern is found when we look at the usage of the University's e-portfolio system (PebblePad). Eighty one percent of students overall report little or no engagement with the system. This system is provided in support of the students own personal and professional development activities. This is a relatively recently provided facility, only having been made available across the entire institution in the last academic year. Looking at usage at the college level there is a slightly higher level of use (7% of students reporting daily access) in CHSS, and this is in keeping of what we know if the small pockets of activity across the institution. Overall, the frequency of non-use is approximately equivalent across the three colleges.

	Frequency	Percent	Cumulative Percent
on a daily basis	20	3.9	3.9
on a weekly basis	17	3.3	7.3
regularly, but less frequently	61	12.0	19.3
rarely, or never	411	80.7	100.0
Total	509	100.0	

Table 25; frequency of use of the University e-portfolio system

Interestingly, when we consider the use of these three Web-based tools as a function of gender there are no significant changes to be found. On the basis of the earlier argument about gender differences, we might conclude that the levels of use of these three tools is driven by their perceived academic relevance and usefulness.

Questions were then asked about the students use of a range of Web- or network-based tools, such as instant messaging tools, or Internt telephony. Forty one percent of students reported using instant messaging systems for social purposes on at least a weekly basis, while only 22% reported use of this tool for any academic

purpose. This seems quite a low rate of use, and perhaps reflects a decline of use of client / server applications such as *Microsoft Messenger* in favour of communications via "social networking" tools such as *Facebook*. Indeed, 88% of students reported using some social networking service on a daily basis, with over 97% reporting use on some form of regular basis. What is quite striking here is that 64% of students reported using some social networking tool on at least a weekly basis for academic purposes. Again, this is a finding that merits further exploration through conversations with students users, to find out just what is meant by this claim. The observation does suggest that an understanding of *Facebook* use as being entirely wasted time may be missing some important dimensions of student communications around their academic work.

Men report themselves to be slightly (though not significantly) more likely to be using instant messaging systems for social purposes, and are significantly more likely to report use of the tool for academic purposes (Chi-square = 8.208; $p < 0.05$). Women are significantly more likely to be using Internt telephony systems (Chi-square = 28.923; $p < 0.0005$) and to be using social networking sites for social purposes (Chi-square = 16.538; $p < 0.001$). Interesting in this context then is that there is no difference in the claimed pattern of use of social networking systems for academic purposes; this is at an equally high level in both men and women.

The use of "social sharing" sites (such as the photo sharing site *Flickr*, or the collaborative tagging tools such as *delicious* or *Diigo*) appears to be low as yet, with only 28% of students reporting any sort of regular use. No gender difference was seen in this low pattern of participation. This would seem to be an area to be developed, as many of these tools offer significant potential for academic application.

Students reported use of the University Library Catalogue shows a slightly worrying pattern (Table 26).

	Frequency	Percent	Cumulative Percent
on a daily basis	75	13.4	13.4
on a weekly basis	118	21.1	34.5
regularly, but less frequently	191	34.2	68.7
rarely, or never	175	31.3	100.0
Total	559	100.0	

Table 26; frequency of use of the Library Catalogue

Only one third of students report using the Catalogue on a weekly basis or more frequently, with almost a third claiming to use the Catalogue rarely, if ever. Slightly, though not significantly, higher numbers in the second undergraduate year make use of the Catalogue and, again not significantly, women report more frequent use than do the men. However, when we consider this reported usage as a function of college membership (Table 27) a rather more encouraging pattern emerges.

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Use of Library catalogue	on a daily basis	39 36.1%	6 5.6%	23 7.4%
	on a weekly basis	43 39.8%	20 18.5%	39 12.6%
	regularly, but less frequently	19 17.6%	39 36.1%	126 40.8%
	rarely, or never	7 6.5%	43 39.8%	121 39.2%

Table 27; frequency of use of the Library Catalogue as a function of college membership

There is a distinctly different pattern of library usage between the students of CHSS and those in CSE and CMVM. The pattern of resource use in the sciences, engineering, medicine and veterinary medicine is more driven by reference to the all-encompassing introductory textbook, while students in arts, humanities and social sciences will be more likely to be directed to resources to be found in the Library. Thus the pattern revealed in

Table 27 seems very much in keeping.

The reported use of e-books is still low, with only 24% of students reporting making weekly, or more frequent, use of this resource. This is perhaps not surprising, as e-books versions of books are not yet very readily available, and the Web-based instances that are customarily available to libraries on license from the publishers are crude and difficult to use as compared with the downloadable e-books which are now available through, for example, Amazon's *Kindle* facility, or *iBooks* for the *iPhone* or *iPad* from Apple.

Again, markedly higher usage is made of e-books by students in CHSS than in the other two colleges (Table 28).

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
Use of e-books	on a daily basis	19 16.7%	3 2.7%	22 7.2%
	on a weekly basis	52 45.6%	10 8.9%	14 4.6%
	regularly, but less frequently	23 20.2%	39 34.8%	92 30.2%
	rarely, or never	20 17.5%	60 53.6%	177 58.0%

Table 28; frequency of use of e-books as a function of college membership

The use of online journals shows a similar, though slightly higher, pattern of usage as that found with the case of the e-book, with a parallel pattern of greater usage in CHSS than the other two colleges. Thirty percent of students overall report using the e-journal collection on a weekly basis or more frequently, although this figure rises to 65% when only students from CHSS are considered. No difference is found between the pattern of usage between the students in 1st and 2nd undergraduate years.

Over half of the student group reported the use of academic materials found openly on the Internt for their study purposes on a weekly basis or more frequently (Table 29).

	Frequency	Percent	Cumulative Percent
on a daily basis	126	21.9	21.9
on a weekly basis	179	31.1	53.0
regularly, but less frequently	210	36.5	89.6
rarely, or never	60	10.4	100.0
Total	575	100.0	

Table 29; frequency of use of materials found openly on the Internt

The proportion is slightly higher for students in their second year (56%) as compared with students in their first year (50%), although the overall pattern is not statistically significantly different. Neither does the gender of the student have a significant impact on the likelihood of using such resources. College membership again here has a highly significant impact (Table 30; Chi-square = 48.314; $p < 0.0005$).

		College Membership		
		Humanities & Social Science (CHSS)	Science & Engineering (CSE)	Medicine & Veterinary Medicine (CMVM)
	on a daily basis	23	14	81
		20.2%	12.5%	25.9%
	on a weekly basis	53	34	76
		46.5%	30.4%	24.3%
	regularly, but less frequently	25	41	137
		21.9%	36.6%	43.8%
	rarely, or never	13	23	19
		11.4%	20.5%	6.1%

Table 30; frequency of use of academically relevant materials found directly on the Internt as a function of college membership

In the case of direct Internet searching for academic purposes the pattern is less clear, with students in the CMVM having the highest proportion of respondents in the category of most frequent use, but also in the less frequent category. Here it may be informative to distinguish between the two distinct groups within CMVM; that is, the undergraduate medical group and the undergraduate veterinary group. In the case of the medical students, 55% report making at least weekly use of such resources, while the proportion is only 26% in the case of the veterinary students. Clearly it would seem that there are very varied patterns of use of such Internt resources for academic purposes, which will relate on a very subject specific level to the availability of relevant resources, and perhaps the specific encouragement that students are given by their senior colleagues.

Finally, we asked students about their experience of using such Web-based applications as blogs[5], wikis[6] and Twitter[7] for academic purposes (Table 31).

	blogs	wikis	Twitter
on a daily basis	4.2%	15.3%	2.5%
on a weekly basis	4.1%	17.2%	1.1%
regularly, but less frequently	9.9%	29.7%	5.8%
rarely, or never	81.8%	37.7%	90.6%
Total	100.0%	100.0%	100.0%

Table 31; frequency of use blogs, wikis and Twitter for academic purposes

As yet, fairly little use is made of these tool, although students will almost certainly have experience of using a wiki form even if it is only to have consulted Wikipedia.

[5] http://en.wikipedia.org/wiki/Blog

[6] http://en.wikipedia.org/wiki/Wiki

[7] http://en.wikipedia.org/wiki/Twitter

Summary

The results have provided a valuable insight into students' attitude and usage of IT. The most notable features are given below:-

- Although in the minority, there is still a number of students who find IT to be a source of some anxiety.
- Generally the more confident students are in CSE, with the least confident in CMVM. Males tend to be more confident than females. This difference in *confidence* however is reported in the absence of any evidence of differences in *competence*.
- Most students now own a laptop, although only a small number of them are prepared to bring this laptop on campus.. There was however a difference across the Colleges in the likelihood that a student would bring his or her machine to the campus with them (with CHSS showing the highest proportion), which most likely relates to different patterns of daily routine.
- In terms of basic technical knowledge, most students claimed to be able to do most routine maintenance tasks, although a worryingly high number (around one quarter) did not know how to carry out backups. Most claimed to know how to use presentation tools and to carry out Internet searches.
- In terms of University provided services around 85% accessed MyEd (the University Web portal) on a weekly or more frequent basis, but worryingly over 10% rarely or never used a VLE and few reported themselves to use PebblePad (the ePortfolio tool).
- Regular usage of the library catalogue tended to be quite low, with the most frequent use made by CHSS students. E-book usage was also low. Over half the group regularly used the open Internet to find materials.
- Of the external services considered, Facebook was the dominant service used by students. Interestingly 64% of students claimed to use Facebook for academic purposes.

In conclusion, these findings raise a number of points to note. Recognition must be given to the fact that some students still find IT challenging and need to be supported in order to allow them to make best usage of IT for their studies. Although laptop ownership is high students seem reluctant to bring them on campus. This potentially could impact on learning and teaching initiatives that require students to have a laptop with them. Facebook appears to used significantly for academic purposes and usage of other social media appears to be small, suggesting University provision of these is not sensible.

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Welcome to the Student Uses of Information and Communications Technologies (ICT) Survey 2011 – 1st and 2nd year of study

At the University of Edinburgh we have a long-term aim of assisting our students to make the best possible use of computers and the Internet in their studies. To help us to improve our courses, we would like to find your thoughts about the use of information and communications technologies (ICT) in your studies. This questionnaire contains 13 questions, is anonymous, and is for research and planning purposes only. We value all opinions - whether you feel yourself to be a confident and skilled user of ICT or not, we want to hear from you.

All data are held securely in accordance with the UK Data Protection Act and available only to members of the research team.

Please mark boxes with a cross: X

Computers & your studies

1. How confident are you about using ICT in your university studies? *(please mark one option)* ?

very confident ☐ | enjoy the challenge ☐ | a little apprehensive ☐ | very apprehensive ☐

2. How helpful have you found computers and the Internet to be in your studies? *(please mark one option)*?

very helpful ☐ | helpful ☐ | not helpful ☐ | hindrance ☐

3. Do you own a computer, or have exclusive access to a computer for your studies?

yes ☐ | no ☐

3a. Is this computer?

a desktop machine ☐ | a laptop/netbook machine ☐ | use both ☐

3b. Is this computer: ***(please mark one option – the machine you use the most)***

windows ☐ | Mac ☐ | linux ☐

4. If you indicated that you have a laptop/netbook, do you carry your laptop to the university campus regularly?

yes ☐ | no ☐

5. Do you have a fast connection to the internet from your term time residence?

yes ☐ | no ☐

6. Please indicate your ability to: ***(please mark one option per line)***

	I do this type of task alone	I would need some help to do this type of task	I have never done this type of task	Don't know / unsure
backup your work and recreational files	☐	☐	☐	☐
keep your **antivirus** software updated	☐	☐	☐	☐
keep your computer's **operating system** (eg Windows, Mac OS, Linux)updated	☐	☐	☐	☐

7. Please indicate your ability to use the following types of software to carry out tasks such as the examples given ***(please mark one option per line)***

	I do this type of task alone	I would need some help to do this type of task	I have never done this type of task	Don't know / unsure
presentation manager (e.g. PowerPoint to create slides for a short talk)	☐	☐	☐	☐
on-line bibliographic/library database (e.g. to search for a specific academic publication)	☐	☐	☐	☐
use the internet to track down statistics or demographic information (e.g. researching for an essay)	☐	☐	☐	☐

Thanks to ELESIG for funding this study

8. Which of the following electronic devices do you own? *(select all that apply)*

Games console e.g. PSP, DSI	IPod touch	eBook Reader (e.g. Kindle)	A 'smart' phone e.g. iPhone, Blackberry or Android	Tablet e.g. galaxy, iPad
☐	☐	☐	☐	☐

9. Please indicate the approximate frequency with which you use the following Internet-based services: *(please mark one option per line)*

	on a daily weekly basis	on a weekly basis	regularly, but less frequently	rarely, or never
MyEd	☐	☐	☐	☐
virtual learning environment (such as WebCT, EEMeC, EEVeC)	☐	☐	☐	☐
e-portfolio tool (such as PebblePad)	☐	☐	☐	☐
instant messenging system (such as Microsoft Messenger) for social chat	☐	☐	☐	☐
instant messenging system (such as Microsoft Messenger) for conversation related to academic work	☐	☐	☐	☐
i**nternet telephone** system (such as Skype)	☐	☐	☐	☐
social network (such as Facebook) for social and recreational purposes	☐	☐	☐	☐
social network (such as Facebook) for any purpose related to your academic life and work	☐	☐	☐	☐
"social sharing" sites (such as flickr) to post your photos online	☐	☐	☐	☐
Library catalogue	☐	☐	☐	☐
e-books (either via the University Library or directly purchasing)	☐	☐	☐	☐
e-journals from the University Library collection	☐	☐	☐	☐
academic articles and sources found openly on the Internet	☐	☐	☐	☐
use of a **blog** for academic work-related purposes	☐	☐	☐	☐
use of a **wiki** for academic work-related purposes	☐	☐	☐	☐
use of **Twitter** for academic work-related purposes	☐	☐	☐	☐

Now please tell us about yourself

10. Age 16-20 ☐ 21-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41-50 ☐ Over 50 ☐

11. Gender female ☐ male ☐

12. Year of study

13. The University School you are enrolled in

Thanks to ELESIG for funding this study