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# A Survey of Macquarie University Students' Home Computers

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# A Survey of Macquarie University Students' Home Computers
## by
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**Abstract**

In May 1998 a group of second year actuarial students at Macquarie University were asked to complete a survey concerning the computing facilities which were available to them at their place of residence. Access to IBM compatible PCs was found to be almost universal, most PCs having Pentium CPUs or better. Microsoft Windows 95 was the most common operating system and Microsoft software also predominated. Most students also had access to a printer capable of producing near print quality output.

**Reasons for Collecting this Data**

The major factors prompting this survey were the following.

Many universities spend considerable resources providing computing laboratories for students. This practice usually makes the implicit assumption that many students need access to such laboratories since they do not have suitable computers and printing facilities at their home. In my school there was no recent data supporting this assumption. We did have data showing that the labs were well utilised, but we did not know how many of the students using the labs could just as easily use their home PCs instead if the labs were not available. This survey was an attempt to provide such data on home computers and printers.

Teaching staff often assume that students are familiar with the type of operating system and software provided in the campus computing facilities. Hence there was a need to determine whether students with home computers were using the same operating system and software as provided in the computing laboratories.

Some units offered by the school use computer-marked tests which currently can only be completed in the computer laboratories. There is a move to develop a new version of this software which can be accessed over the internet. This system would only be worthwhile if a significant number of students were able to access it from off campus, so there was a need to collect data on students' access to the internet.

**Reasons for Publishing the Data**

This paper is being made more widely available not just for the profile of home computers it contains, but also for the insights into survey design it may provide. It contains information concerning the types of questions about home computers which elicit useful responses from students and the types which are best avoided. Thus this paper may give academics a useful starting point for constructing their own surveys.

If this paper does nothing else, I hope it encourages academics to carry out their own surveys. The data reported here is likely to be of limited relevance outside Australia. For example, university students in USA are likely to have a higher standard of computer facilities at home than their Australian counterparts, simply due to the lower cost of the computer hardware in USA. Also, computing equipment and software dates quickly. Even in the university in which this data was collected, it will be largely irrelevant within 2 years. The only way to gain a reliable picture of your students' home computing facilities is to survey them yourself on a regular basis.

**Outline of Survey Technique**

A survey form was distributed during a lecture of a second year actuarial unit during May 1998. The students were given time to complete the form during the lecture and the forms were collected.

Theoretically students may have been able to produce more accurate data if they had been able to take the survey form home. For example, many students indicated that they did not know the speed of the CPU in their computer. Had they completed the survey at home, they would have been able to consult their computer to determine this speed. However, while it would be possible for students to do this, there is no way to guarantee they would do so. Also, if students were allowed to take the survey forms home, it was felt that many of the forms would never return.

Hence I decided to administer the survey during class time. This ensured a high response rate, the cost being that "don't know" was a popular answer for a few questions.

The sample size was 67.

Note also that for brevity, this paper often refers to 'home computer', but the survey itself referred to the computer facilities the students had at their current place of residence. For example, out-of-town students residing at a university residential college during term were being asked to comment on their facilities at the residential college rather than at their out-of-town home.

**Home Computer Ownership is Almost Universal**

Of the 67 students, only 1 did not have access to a computer at their place of residence.

The question asked did not differentiate between those with access to a single home computer and those with access to several. Where students did have access to more than one computer, the survey asked them to complete the remaining questions in respect of the home computer they were most likely to use for their university work.

Of those with home computers, 77% shared the computers with other members of the household, the other 23% being sole users of the computer.

**IBM-compatible systems predominate**

Of the 66 students with home PCs, only 1 reported using a Macintosh computer. The other 65 used IBM compatible PCs.

This pattern may be strongly influenced by the types of computers used in high schools in the state of New South Wales. It would be interesting to see whether the same pattern is repeated in other states of Australia and overseas.

**CPUs**

The 65 students with IBM-compatible PCs were asked to provide data about the CPU.

This question was not asked for students with Macintosh computers. This was done partially because it was suspected (correctly) that there would be insufficient Macintosh computers to collect useful data, and partially because the author had insufficient knowledge about them to know what question to ask.

Students were asked to subdivide their CPU by type. The results were:

| Type | Number |
|------|--------|
| 386 | 2 |
| 486 | 7 |
| Pentium | 47 |
| Pentium Pro | 1 |
| Pentium II | 4 |
| Don't know | 4 |
| | 65 |

The low number of Pentium Pro CPUs is surprising. Perhaps some Pentium Pro CPUs have been misreported as standard Pentium CPUs.

It may have been useful to ask for the year in which the computer was purchased. This would have supplied a reasonableness check on the CPU data and would give some basis for guessing whether the "Don't Know" cases were likely to be atypical. For example it would be plausible to suggest that those with the oldest PCs are least likely to remember the type of CPU.

Students were also asked to state the speed of their CPU. The most popular answer was "Don't Know". Also, in some cases the speed claimed does not seem consistent with type of CPU claimed, suggesting perhaps that some students were guessing or not remembering accurately. Thus I do not feel sufficiently confident in the accuracy of the speed data to report it.

In retrospect, it was probably not worth asking for data on CPU speeds. Not only is the data of questionable accuracy, it is also not particularly important. Even the slowest pentium PCs are quite fast enough for solving computing problems of the complexity encountered in our units.

Another shortcoming of the questions about CPUs is that they did not allow for the possibility of a PC with two CPUs. None of the students volunteered to having such a PC and it is very unlikely that any would. (Quite apart from the cost factor, the next section shows that only 3 of the students had a PC where the preferred operating system was capable of employing two CPUs.) However, this may change over time and when I repeat the survey in future years I plan to explicitly ask how many CPUs the PC contains.

### Microsoft Windows 95 Operating System Predominates

For the IBM compatible PCs, Microsoft® Windows® 95 is by far the most common operating system. The subdivision was as follows.

| Operating System | Number |
|------------------|--------|
| Windows 3.1 or 3.11 | 6 |
| Windows 95 | 56 |
| Windows NT | 3 |
| | 65 |

Microsoft Windows 3.1 and 3.11 were given as separate categories in the survey, but the results have been grouped together here due to concerns that some of the students did not understand the distinction and so the subdivided data was unreliable. (Also 2 students indicated their operating system was an unknown version of Windows predating Windows 95. Based on the reported configuration of the PCs in question, both these cases are likely to be Windows 3.1 or 3.11, and so they were included in the 6 cases reported above.)

The 3 students using Microsoft® Windows NT® consisted of 2 cases using version 4.0 and 1 case where the version was not known.

Systems with multiple operating systems were rare. Two Windows 95 users reported also having the option to boot to a different operating system, one case to Windows NT 4.0 and the other to an unspecified version of unix.

(Most Windows 3.1/3.11 users reported also having the Microsoft® MS-DOS® operating system, but then this is a necessary requirement for these versions of Windows. Many Windows 95 users reported also having MS-DOS. However, there is a suspicion that in many cases these students were referring to either the command prompt under Windows 95 or perhaps to the Windows 95 capability to reboot to its own internal version of MS-DOS.)

## Microsoft Software predominates

Students were asked to indicate which word processing packages they had available to them. The results as follows.

| Package | Number | |
|---|---|---|
| Word 2.0 | 1 | |
| Word 6.0 | 7 | |
| Word 95 (or Word 7.0) | 14 | |
| Word 97 (or Word 8.0) | 39 | |
| Word, version unknown | 1 | |
| Total Microsoft Word | | 62 |
| WordPerfect 6.0 | 3 | |
| WordPerfect 3.0 for Macintosh | 1 | |
| Total WordPerfect | | 4 |
| | | 66 |

The single Macintosh computer has been identified for clarity. One student reported not having a word processor. If students reported having two different versions of on the one package, only the most recent version was counted, on the assumption that this would be the one most likely to be used. One student reported having both WordPerfect® 6.0 and Microsoft® Word 97, and both these cases are included in the above. In retrospect, where a computer had multiple word processing packages, it would have been more useful to ask the student to state which particular package they were most likely to use.

The general conclusion is that Microsoft® Word predominates, with most students having access to quite recent versions of this package.

A similar question asked for data on spreadsheet packages. The results are as follows.

| Package | Number | |
|---|---|---|
| Excel 4.0 | 1 | |
| Excel 5.0 | 1 | |
| Excel 6.0 | 7 | |
| Excel 95 (or Excel 7.0) | 13 | |
| Excel 97 (or Excel 8.0) | 38 | |
| Excel, version unknown | 2 | |
| Total Microsoft Excel | | 62 |
| Lotus 1-2-3 | 3 | |
| ClarisWorks 2.0 for Macintosh | 1 | |
| Total | | 66 |

Two students reported not having a spreadsheet, (though curiously neither of these was the same student who did not have a word processor.) Again, if students reported having two different versions of the one package, only the most recent version was counted, on the assumption that this would be the one most likely to be used. Two students reported having both Microsoft® Excel and Lotus® 1-2-3®, and both these cases are included in the above.

The general conclusion is that Microsoft® Excel predominates, with most students having access to quite recent versions of this package.

Many students had the same versions of Microsoft® Word and Microsoft® Excel, probably due to having obtained both as part of the Microsoft® Office package.

Students were asked to state which programming languages were available on their home computer. The only languages reported more than twice were Basic (50 occurrences), Pascal (31 occurrences) C++ (10 occurrences) and Visual Basic (5 occurrences). The figure for Basic is probably an understatement, since a Basic compiler comes bundled with Microsoft operating systems.

### Printers

Of the 66 students with home computers, 62 also had access to a printer at home.

A further question asked students to identify the type of printer. Some students had more than one type of printer and all have been counted in the following results table.

| Type of Printer | Number |
| --- | --- |
| Dot Matrix | 10 |
| Laser Printer | 15 |
| Inkjet | 39 |
| Unknown | 2 |

Thus the great majority of students have access to a printer producing near print quality output, quite sufficient for submission of university assignments.

### Internet Access

Of the 66 students with home computers, 50 students (75%) had access to the internet from their place of residence. The types of access were as follows.

| Form of Internet Access | Number |
| --- | --- |
| Not specified | 2 |
| Residential College | 8 |
| 14.4Kbps modem | 1 |
| 28.8Kbps modem | 11 |
| 33.6Kbps modem | 18 |
| 56Kbps modem | 6 |
| Modem - speed unknown | 4 |
| | 50 |

The "Residential College" category refers to students residing at the university's residential colleges, which have access to the internet via a direct link to the university network. The survey form suggested likely modem speeds but unfortunately omitted the 33.6 option. Several students claimed speeds such as 33.3 and 36.3, which have all been assumed to be 33.6 in the above table.

**Awareness of University-based E-mail Facilities**

At enrolments at the beginning of 1998, all undergraduate students were supplied with a computer account which can be used to send and receive e-mail from a number of computer laboratories on campus. (For an additional fee students can also access these accounts via the university's modem bank, but very few students have chosen to pay for this option.)

Of the 67 students surveyed, only 46 students (69%) were aware of this on campus e-mail facility.

Of the 46 students who were aware of this facility

- 17 students (37%) had used the facility to send e-mail during the semester;
- 16 students (34%) had checked for incoming e-mail at least once during the semester; and
- 12 students (26%) had checked for incoming e-mail during the last week.

This gives a fairly strong indication that merely providing an e-mail service to students is not sufficient to cause many of them to use it.

**Other Topics which Could be Surveyed**

The above results have been circulated to interested parties in my school and several have suggested other issues which could usefully be covered in future surveys. These are:

- Ownership of laptop computers. We suspect few of our students currently have access to laptop computers, but we have no hard data. In many units, we will be able to set far more practical test questions once we can assume that all our students can bring to the test a portable computer with a spreadsheet package.
- Web Browser. Many of the developers of web resources in our school are interested in the software students use to view their web pages.
- CD-ROM drives. Some staff are wrestling with the problems of distributing large data sets or software to students. Downloading large files from the school's web server is a slow process. Distribution on CDs may be a viable alternative provided students have access to a CD-ROM drive. Considering the data collected in this survey, an educated guess would be that almost all the computers involved would have a CD-ROM drive, but it would be preferable to ask this explicitly in the survey.
- Backup media and practices. There is some concern that students may need some education about the need for regular data backups.

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