

The nature and extent of computer based electronic communications use by Swinburne University of Technology Multi-modal Learning (Applied Science) students and staff.

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## Abstract:

An analysis of the nature and extent of computer based electronic communications use by Swinburne University of Technology Multi-modal Learning (Applied Science) students and staff. Students and staff in the MML Project each have personal portable computers and full Internet

connectivity from the University and home. Their special network facility includes group and sub-group broadcast arrangements to promote extensive communications for educational purposes. The paper focuses on the variety of social, administrative and learning uses of email and associated facilities by students and staff. A collection of email messages directed to the authors or broadcast on the network by staff and students is the basic data source. Use and abuse, benefits and problems created for students and staff involved with this open electronic educational infrastructure are described and analysed.

### 1.

#### Introduction:

This paper presents data on and analysis of the use of electronic mail and associated facilities by students and staff involved in the multi-modal learning project at Swinburne University of Technology - Mooroolbark Campus during 1993 and 1994. It is presented in two main sections, general description and analysis of electronic mail received by the Director of the MML Project and compiled by the MML Project Assistant, and a Student Case Study prepared to examine and analyse material not accessible to staff.

### 2. Context:

The Multi-modal Learning Project operates as a pilot program with the School of Mathematical Sciences, School of Computer Science and Learning Services Department providing teaching and learning for undergraduate students enrolled in the degree of Management Science and Computing [formerly Mathematics and Computer Science] at Mooroolbark Campus.

### 3. Definition of Multi-modal Learning:

Multi-modal Learning is the term chosen by the university to identify the set of educational procedures, associated administrative

arrangements and infrastructural provisions which provide for a mixture of on and off-campus learning, with use of media and modes determined by staff and students according to intended learning outcomes or preferences. In some other places multi-modal learning has been described as "open learning", mixed mode learning, combined mode learning [Jeavons 1994], flexible open-campus learning [Moran 1994], telelearning [Killen 1993], and similar.

At Swinburne MMLP has resulted among other things in the university providing a designated MML server computer, banks of modems and ancillary equipment, with custom written software, to allow students equipped with personal portable computers [notebook computers] to connect from their homes and many other locations to the university facilities, staff and via Internet to the world. MML students and staff are being encouraged to engage in a mixture of on and off-campus learning and teaching with among other things a very highly developed communications facility. This provision is intended to have effects in reducing location constraints for participants and also impact on the people involved to result in more time for study utilising the methods and sources of information optimal for each learning task undertaken. Students and staff are expected to rationalise their learning strategies to take advantage of advanced telecommunications and computer technology for the purpose of increased learning in more efficient and appropriate styles and locations.

#### 4. Hardware and Software:

Students and staff in the MML Project have notebook computers [486SX, 8mb] and modems to allow them to use a full range of computer based communications or learning programs at all times and in a wide variety of locations. Teaching and learning proceeds with a range of software on-board the machines or accessible via the university LAN. Also available are CBL packages such as iMaster Ci [Waite,1990] and the tutorial package distributed with MS Excel [1992]. The university provides Maple [Maple, 1993] and Minitab [Minitab, 1993 ] plus telecommunications interface software on a designated UNIX server to support teaching and learning.

#### 5. Electronic Communications (E-mail):

E-mail refers to any mail or messages transmitted electronically by computer using communication channels . Students and staff can readily connect to the network via the telephone system or in libraries and laboratories and offices.

from home or the University.

Some students have modems built into their computers whilst others have separate modems which typically remain at home. It is mainly from home that students are expected to connect via modem, given that there are adequate direct network connection points at all campuses of the university and at learning centres. The major intention of home access to the network was to facilitate communications between staff and students and allow tutorials to be conducted individually or for groups with the lecturer and students free to assemble at any convenient location. Calls to the server computer from students or staff is one local telephone call fee.

#### 6. Full Internet Connectivity:

One of the features of the network support provided to the pilot project is easy access to the Internet via Gopher, IRC and other advanced tools. The university's aim in such provision is to allow students and staff to use the virtual university, the world information network, to supplement course work. There are indications that this provision is likely to result in study advantages for students especially in the latter years of their courses. It is anticipated that some courses will have a greater need for use of external information sources than the present Applied Science pilot groups. (The degree of use of these aspects of the educational provision will be explored in subsequent papers).

#### 7. Special Network Facility:

A useful dimension of the network server arrangements made to assist students and staff is group broadcast arrangements for each of the student groups and any combination of them. With this assistance student and staff can easily send messages to class groups, year groups, all staff or all members with one special address which uses an alias arrangement to network the message to the chosen members.

#### 8. Classification of Messages

The electronic messages that were received during 1993/94 by the MML project officer were classified into five groups: social,

administration, learning, technical problems, and network ethics. Classification was based on the primary information communicated by the sender rather than the secondary information that the message may refer to eg. The primary message communicated by a sender may give information about the time, date, and place of an educational conference (administrative category). The same message may go on to explain the educational potential of the conference,. However, this

information is not specifically aimed at teaching something and as such was not deemed to be the basis for the classification of the message.

The following definitions and descriptive examples explain the above in more detail.

### 8.1 Learning Category

This includes messages that are specifically written with a view to teaching the recipient something eg. Lessons on how to use OPAC, answers to specific questions relating to a particular subject etc. See figures 1 & 6.

### 8.2 Social Category

This category includes any message that refers to exchange of friendly 'chit-chat', companionship and hospitality eg. an invitation to a BBQ, offers of a lift to university etc. Figures 1-3 are examples of this category. See figures 2 & 3.

### 8.3 Administrative Category

The management and organisation of operations within Swinburne University and from external organisations other than Swinburne eg. time, date and place arrangements, timetable details, and car parking permits etc. See figures 4 & 5.

### 8.5 Technical Problems Category

Computer software/hardware and connection difficulties whilst using email eg. Problems logging onto the email system, spurious character problems etc. See figures 7 & 8.

### 8.6 Network Ethics Category

This category includes all messages that relate to network abuse. Abuse as defined in the "Code of Practice" document version 2.0 [Swinburne, 1994] eg. fraudulent use of passwords, abusive language, etc. See figures 9 & 10.

## 9 Analysis of the Received Messages:

### 9.1 Learning Communications:

It can be seen from Table 1. [Appendix 1] that a disappointingly low usage of the network facility is for learning purposes. It is possible that communications relating to learning are not shared (by broadcasting) with the Director of MML and that there are learning communications related to course work which is conducted between students or teaching staff member to students. However, information from students suggests that this is an aspect of technology use which is very under-developed.

Staff messaging is also low in this data set but this may also relate to the factors identified above for students. Staff messaging results mainly from library and other support staff attempting to assist academic staff with use of the network for development purposes.

Personal learning uses of the network are reasonable and comprise mainly work done in conjunction with an Internet courses and discussion groups.

All of this cluster of data reflects the stage of the innovation, in that off-campus teaching has not yet been implemented and the first cohort of students have just completed their second year of studies. Staff have been engaged in other aspects of MML such as writing learning guides and have not yet been willing to invest time and expertise into using the network for learning or teaching purposes.

## 9.2 Social Communications:

There was a decline in usage of the system for social communications 1993 to 1994. Tentative explanations of this include stricter student control over messaging [learned by the first cohort by trial and error and passed on to the second cohort through peer tutoring] which resulted in reduced leakage of messages to the collection which has been analysed for this paper. It is also due to a possibly less cohesive cohort in 1994. As students in both cohorts are on-campus as well as having the email facility, many students use conversation at campus rather than electronic letters for their social purposes.

There are more male students in the course but never-the-less males use the system more heavily than female students. Staff generally use the system very little for social purposes. The individual user represented in the data set uses email for social (and academic) communications with a colleague in New Zealand.

## 9.3 Administrative Uses:

This is the highest use category for the collected data. Allowing for the gender factor, administrative use of the network is uniformly high across student, staff and external categories. Use for this category has reduced over the period studied. Possible explanations include reduction in the tribulations concerned with establishment of the system at the beginning of the project.

#### 9.4 Technical problems:

This category has shown a satisfying trend downwards but it needs to be noted that many training needs and technical difficulties are reported and dealt with by mechanisms other than email eg. direct contact with persons in charge of the technical facilities.

#### 9.5 Network Ethics:

By and large the data demonstrates that students use the system for legitimate purposes but we have had several cases of abuse of the system which ought to be described in order to maintain a perspective on this aspect.

Students, like children in a sand-pit, explore the system and its

operations. In some cases this exploring has led to incidents which others have found objectionable or which are immature or unethical. In one incident students messaging each other in private mode accidentally sent their messages to all staff and students. Some people were distressed by the content and style of the erstwhile private messages. In another incident students adopted ibotî programs without understanding their nature in IRC. The bots were taken over by strangers and used for malicious commandeering of communications channels.

#### Summary:

The foregoing data and analysis was based on the mail collected by the MML Project Director and consequently does not contain details of the private uses of the network by students. To provide a further insight into student communications the following case study by one student in the MML course is presented.

#### Student Case Study

## Student uses of electronic communication in multi-modal learning

### 10. Introduction

There are many facilities available through electronic communication. Some of these are Internet Relay Chat (IRC), Electronic Mail (E-mail), Network News, Library Search and more. These will be discussed in this paper.

### 11. Electronic Mail (E-mail)

The most widely used facility, by MML staff and students at Swinburne's Mooroolbark Campus, has been E-mail. The following analyses all the messages received in 1994, [see Table 3 Appendix 1] which accounts to 8 months of received messages due to students accounts being terminated at the end of 1993, without warning! Data was lost.

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#### 2. Analysis of Messages:

This analysis classifies messages into three categories; social, administrative and learning. Examples of each are described below.

#### 12.1 Social Messages

From Table 1 [Appendix 1] , it can be seen that the majority of messages from Swinburne students, were from females (even though they only sent two more messages than the male students). When students began using e-mail, writing social messages was very popular. But now, the novelty has worn off as our course is an on-campus course and we see each other regularly. A minority of students don't use the e-mail facility and depend on hearing about the messages 'on the grape vine'.

I received nine messages in total from both male and female staff at Swinburne although all messages were from the male staff. This is understandable as I have no female lecturers teaching me even though there are five female lecturers at Mooroolbark.



From people external to Swinburne, I received nine messages, which were all from a friend of mine. This friend used to be a student in the same course as myself, but because of family commitments she had to move interstate. It took her a while to obtain an e-mail account but when she did, we were able to send letters to each other electronically instead of sending them by Australia Post. This enabled us to read the letter the same day it was sent and send a reply on that same day. A lot faster than Australia Post! (Refer to Figure 11).

Another social message was broadcast from our Director of Multi-modal Learning Project reminding students that there would be a sausage sizzle on a specific date and specific time to celebrate the end of classes for the year. (Refer to Figure 12).

Out of the total messages received, 16% were of social content.

## 12.2 Learning Messages:

As can be seen from Table 1 [Appendix 1], learning uses are quite low overall. I received only one message from a student, and only four from staff.

I received a total of nine messages from sources external to Swinburne, mainly from the U.S.A. These were in response to a broadcast message I sent on Network Access (see section 14) asking for help on information regarding Data Communications hardware. Our library did not have much, and I thought it would be an idea to see if anyone could help. As it turned out I received a lot of messages because my original message was broadcast to those who were reading messages under a specific topic. I acknowledged the source in my essay. (Refer to Figure 13).

Other messages included one from a student in first year, broadcasting to other students if they knew a certain extension for computer files. (Refer to Figure 14).

In total, 8% of all messages were in the category of learning.

## 12.3 Administrative Messages

The category of administration received the most messages. More male students sent messages than female students. There were more messages

from male staff at Swinburne than female staff, again because no female

staff teach me. Staff definitely send more administrative messages than students.

There were no administrative messages from people outside of Swinburne. This reflects reality as there is really no need for them to do so.

Examples of staff administrative messages are ones where staff would tell students what specific day they would be available and on campus. This would help greatly those who live quite a distance from the campus and save them transport costs and time, as normally the student would travel to the University only to find the lecturer was not there. (Refer to Figure 15).

Another example would be staff broadcasting to students that certain assignments were available to pick up. (Refer to Figure 16)

Students would also send administrative messages to each other. I received many messages from my fellow students to advise me what day they were available to get together and study for a group project assignment. Also, if I needed a lift to University, I would e-mail a group of students and ask for a lift. This was better than making a number of phone calls to people separately. Here, I only made one phone call to log on to the network at University and from there I typed up a letter to a number of students.

(Refer to Figure 17)

In total, 76% of all messages were in the category of administration.

### 13. Internet Relay Chat (IRC)

IRC is a multi-user multi-channel chatting network. It allows people all over the Internet to talk to one another in real time. Each IRC user has a nickname they use. All communication with other users is either by nickname or by the channel that they or other the user are on (Internet Administrator, 1994).

IRC may be used by all students and staff at Swinburne Mooroolbark. There are many uses for IRC although the main use is for socialising. Some users may ask questions about other countries which other users may be from. This is a learning aspect of IRC. Also if one user want the answer to one question, he/she may broadcast it on the channel. If there are many users on the channel, then the chance is that the enquirer will receive an answer.

99.9% of communication on IRC is international communication. There is an Australian channel, as there is an English channel and an American channel. But these channels are still open for people to join who come from any country.

The benefit of IRC is that students and staff can make an international connection so easily.

### 13.1 Tutorial Use

Another use of IRC is for lecturer and student communication rather than the telephone. When IRC is used it is easier to see what the lecturer is saying and writing. For example, talking to a Math lecturer, it would be easier if he/she typed a specific equation on the screen rather than speak it over the telephone. Also it saves the student travelling into University just to maybe spend 5 minutes with their lecturer.

Swinburne will conduct off-campus tutorials in the near future using IRC as it will save travelling expense and time to both students and staff. (Swinburne University has three campuses.) It also enables students to have access to lecturers instead of trying to fit in with their limited time. The time saved could be spent on extra study.

The conference system could function in two modes: a broadcast mode with everyone in the conference having access to the information or an individual mode allowing the tutor to choose to speak to an individual student only. These two types of channels are currently available using IRC software which is already familiar to many students (Thomson, 1994).

### 13.2 Main Problem with using IRC

The only problem students have found, is that IRC can be addictive and cause problems with our study program. Time management is a necessity if students want to use IRC.

One night after spending a day studying, I decided to relax and participate on IRC. I logged on at 9:30pm. My mother was interested in what I was doing and decided to watch me. Before we knew it, it was 1:00am in the morning. We had spent 3 and a half hours on IRC. And

even then, I didn't want to log off!

#### 14. Network Access

Otherwise known as Network News, this facility is a world wide information exchange service covering numerous topics in science and everyday life. Topics are organised in news groups and these groups are open for everybody to post articles on a subject related to the topic of the group (Network News Administrator, 1994).

As mentioned before, this was used for obtaining information for a research assignment. Broadcasting to many people yielded a lot of information. E-mail from overseas was relevant and quite useful.

This facility is effective when used with other means of obtaining information. Students still need to look up references in the library, but this method possibly helps students get more information than what they could have normally in local areas.

#### 15. Swinburne Library Search

This tool is available to students and staff to provide the means to look up books that are available and place "holds" on the books that are required from another environment other than the library itself. Again this saves travelling time for students. Without this service, students would normally travel to the University and go to the library hoping that the book is available. With Swinburne Library Search service the student can find out if the book is available before they travel to the University

#### 16. Conclusion

The purpose of this section of the paper was to describe students use of electronic communications facilities at Swinburne University of Technology, Mooroolbark. All facilities are of advantage to the students in their learning. Without these facilities, students doing on-campus courses will survive throughout their course, but with them, students have the chance to take a step further with their studies and use their initiative to research information from a wider environment. The efficiencies gained by using e-mail for administration are mainly savings on time and money. Another saving is rooms on campus, when students participate in tutorials from home using IRC. With these

savings, the University can place their money into something other than building new rooms.

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Table 1: Total Number of Messages received by MML Project Officer

Sender	Social		Learning		Admin		Tech Probs		Network Ethics	
	1993	1994	1993	1994	1993	1994	1993	1994	1993	1994
	n	n	n	n	n	n	n	n	n	n
M	22	3	0	0	63	10	4	1	17	0
F	5	1	0	0	27	1	2	0	0	0
T	27	4	0	0	90	11	6	1	17	0
MS	4	5	3	3	101	66	3	0	3	2
FS	3	1	4	1	28	23	0	0	0	0
T	7	6	7	4	129	89	3	0	3	2
M	20	9	21	31	51	47	0	0	0	0
F	0	0	9	9	4	9	0	0	0	0
T	20	9	30	40	55	56	0	0	0	0
Total	54	19	37	44	274	156	9	1	20	2

M/F = Male/Female student (Swinburne)

MS/MF = Male/Female Staff (Swinburne)

MSX/FSX = Male/Female External (not at Swinburne)

Table 2: Email Messages Received by /Second Year Student at Swinburne University (From 22/3/94 - 21/11/94)

Sender	Social		Learning		Admin		TOTAL		
	n	%	n	%	n	%	n	%	
Students									
M	44	4	40	1	100	9	60	14	54
F	14	6	60	0	0	6	40	12	46
T	58	10	100	1	100	15	100	26	100
Staff									
MS	22	9	100	4	100	116	97	129	98
FS	5	0	0	0	0	3	3	3	2
T	27	9	100	4	100	119	100	132	100
External									
MSX	na	0	0	9	100	0	0	9	50
FSX	na	9	100	0	0	0	0	9	50
T	na	9	100	9	100	0	100	18	100
TOTAL	na	28	16	14	8	134	76	176	100

M/F = Male/Female Students (Swinburne)

MS/FS = Male/Female Staff (Swinburne)

MSX/FSX = Male/Female External (not at Swinburne)