Electronic Mail Usage by Full-time Teaching Faculty, Faculty of Education, University of Manitoba

by Darlene G. Searcy

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfilment of the requirements for the degree of

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ABSTRACT

The purpose of this study was to investigate the functional use of email communication by the full-time teaching faculty with at least 10 month term contracts in the Faculty of Education, University of Manitoba. The 41 full time teaching faculty with at least a 10 month term contracts were surveyed as a cluster sample by written mail questionnaire. Twenty-three questionnaires were returned. The survey consisted of 67 questions which sought to answer four fundamental research questions.

- How widespread is email use in the Faculty of Education, University of Manitoba?
- How is email being used in the Faculty of Education, University of Manitoba?
- What are the attitudes of the full time teaching staff of the Faculty of Education, University of Manitoba toward email technology?
- What are the demographics of email use in the Faculty of Education, University of Manitoba?

Full time teaching staff of the Faculty of Education, University of Manitoba are using email technology on a day to day basis to send, receive and print email messages. Other more complex applications are being used by most for mainly administrative tasks, but fewer use email for social activities, to resolve conflict or poll opinions. Nearly all of the respondents agreed that email was useful in their work, made them more productive and was easy to use. Anxiety was felt primarily when something went wrong. While more than half of the respondents gave their email address to their students, fewer used the technology to communicate with them. Support for system users was considered adequate by nearly half of the respondents. Nearly half would consider email inservicing but most respondents indicated that better keyboarding skills would not increase email use. The majority of those who replied to the survey learned to use email on their own, were male and had more than twenty years of teaching experience.

The study presents a snapshot of faculty use of email technology. Follow-up

interviews (which were not a part of the research protocol) might have provided a more detailed picture.

Shortly after the study was completed, a new email system was introduced. Therefore, replication of the study is recommended.

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Chapter I

INTRODUCTION

In one sense, electronic mail made its first appearance in 1844 in the form of the first telegraph message sent by its inventor, Samuel Morse. He tapped out the message, 'What God hath wrought!', to which his partner, Alfred Vail, waiting in a railway station 40 miles away, replied 'Yes,' which also ushered in the age of miscommunication (Buckley, 1996). The development of the telegraph was followed by the telex, facsimile, computer-based message systems and voice mail systems. This evolution toward an electronic form of communication in society drew a great deal of attention. In fact, 1996 saw the Canadian Prime Minister announce his email address (pm@pm.gc.ca), signalling the move of this technology into the mainstream of society.

The beginning of the more modern understanding of email came about, as discoveries often do, quite by accident. Popularly called the 'razor retrieval caper', the first use of email went beyond the official parameters set by the government/defense establishment network, ARPANET. In 1973, as Len Kleinrock was unpacking in Los Angeles, fresh from a computing conference in England, he realized he had left his razor in the Sussex University dormitory bathroom. Lines had already been established between the United States and the United Kingdom (Brighton) to test the transmission of data packets via satellite. A bit of software happened to be on the network called the resource-sharing executive, or RSEXEC. It could search a "who" list of those currently logged on at that moment. Kleinrock found a colleague, Larry Roberts who, at three a.m. (U.K. time) was indeed logged on. Using a teletype connection, he linked up with Roberts using TALK, a split screen conversation utility. The razor was requested and found and sent back to Los Angeles with yet another returning colleague. Kleinrock has said, "It was a thrill. I felt I was stretching the Net." (Hafner & Lyon, 1996, p. 189). And so email was born.

We are far from understanding all of the implications of the computer age. Changes in the way in which humans communicate urge us to learn more about our needs

and desires. Electronic literacy is here now and like other communication phenomena it will take some time to discover just what the potential and limitations of the new technology are. The potential of a new technology is, historically, not always immediately self-evident. As a general observation, humans must first experiment with the new invention. It was this reality Thomas Edison faced after he had invented the phonograph in 1877. As a result, the following year he published an article suggesting ten ways in which the invention might prove useful to the general public (Basalla, 1985, p. 140). His suggestions included 'talking books' for the blind, the preservation of important family sayings, recording the last words of the dying, the creation of new sounds for musical boxes, teaching spelling and recording telephone calls. Edison felt that music was a trivial use of his invention and believed that the only legitimate employment of the device was in a business office. Email also grew from an uncertain, elite beginning, but eventually, as Hafner & Lyon (1996), write, "Electronic mail would become the long-playing record of cyberspace. Just as the LP was invented for connoisseurs and audiophiles, but spawned an entire industry, electronic mail grew first among the elite community of computer scientists on the ARPANET, then later bloomed like plankton across the Internet." (p. 189).

The use of email, still in its infancy, is in many ways at the state of development the phonograph was 120 years ago, in that it is only now being widely introduced into society and we have yet to discover and document its full limitation and potential.

Email is the widely used term for a computer-mediated communication message system. It is the ability to send and receive messages in an electronic format. It is a particularly useful system for networking with large groups of people and is now being widely used in business, the military, government and education.

A very early definition of email can be found in the Dictionary of Education (Good, 1959), under the heading 'conversational computing'. It describes an early vision of electronic mail this way: "...employment of teletype or typewriter by the computer user to input his messages via telephone to his program: message, preferably two or three lines, will be responded to within 1-15 seconds; all messages between the user and the

computer can be recorded inside the computing system for later analysis; this method of computing permits successive messages to the computer to be contingent on the previous response, so that the method is useful in computer-assisted instruction, and in the conduct of experiments." (p.124). The Dictionary of Instructional Technology (1986), defines electronic mail as, "A general term for systems that enable memoranda, messages, etc. to be sent from one individual department, institution, etc. to another solely by electronic means...The most common type of electronic mail system is based on the use of a large multi-terminal computer or network of micro-computers and enables messages to be stored in each receiver's file, for perusal at a time convenient to the receiver." (p.57). A more recent definition of electronic mail by Cafolla, Kauffmen & Knee (1997), is simpler: "Messages, usually text, sent from one person to another via computer. Email can also be sent automatically to a large number of addresses." (p. 221). One author has suggested that electronic mail technology shows all indications of outstripping the telephone for communication partnership (Sherblom, 1988). In 1992, email usage on the Internet was estimated at more than 3 million users with a 10% growth rate per month. (Carroll, 1992). Even more recently, in 1994, the Electronic Messaging Association (Leslie, 1994), said usage had increased to the point where approximately 30-50 million people use email with about 16 million of those in North America. The mission statement of the Electronic Mail Association states, "The EMA exists to champion the development and use of secure global electronic commerce." (http://www.ema.org/ema-home.htm), making clear the worldwide capabilities of this form of communication. Email usage continues to expand. Carroll, Broadhead & Cassel (1997), write: "Many organizations have discovered that a link to the Internet email is the most useful application of all Internet capabilities. The reason for this is that email is the only application that extends well beyond the boundaries of the real Internet and involves many other email systems and many different technologies." (p.111).

Acceptance of new technology differs among individuals (Dambrot, Watkins-Malek, Silling, Marshall and Garver, 1985), and from an educational viewpoint, any substantial change in teacher behaviour takes several years (Hord, 1987). One factor

which may contribute to this lack of utilization is the individual's attitude to new technology (Torkzadeh & Koufteros, 1992). In order to be productive using on-line technology, the user must be familiar with and have confidence in the available technology. One study found that people must have a positive attitude and feel efficient in order to use computer technology (Kinzie, Delcourt & Powers, 1993). Variance in attitude toward computers has also been shown according to demographic particulars, specifically gender differences in attitudes toward involvement with computers (Dambrot, Watkins-Malek, Silling, Marshall and Garver, 1985 and Loyd & Gressard, 1984 b.). In age and gender studies, the literature has generally reported conflicting results. This leads researchers to conclude that other factors must be at work. One paper found that a need must be perceived by the instructor or usage of new technology will not occur (Mecklenburger, 1990).

People who are in the business of teaching are at a disadvantage if they cannot function effectively with computer technology (Handler, 1993). Technology and education have always been the source of a great deal of discourse. Since passing on knowledge is the force which drives education, it is natural that research discussion would centre on how to best deliver this knowledge.

Computers in Education

Education has long used technology to try improve teaching methods and enhance student learning. The year 1946 marked the beginning of the computer age. The first electronic computer was built by Mauchley and Eckert at the Moore School of Engineering of the University of Pennsylvania (Mathews & Wolf, 1983). The counting machines of Pascal, Babbage and Hollerith and the calculators of Stibitz and Aiken, were the precursors to the first generation computer, the ENIAC, developed in 1946. Second generation computers made use of transistors instead of tubes, and computers of the third generation use silicon wafers or chips that incorporate many circuit elements in a very small space. This miniaturization continues with the lap top computer which can process 20 million operations a second using minimal electricity. In the early 1960's, Gordon

Moore, the co-founder of Intel, spoke of what is now called, informally, 'Moore's Law'; this states that transistors on a chip will double every 18 months and the price will fall by half. This prediction has held true up to the present.

Philips & Santaro (1989), completed a study involving electronic communication for instruction and found more frequent student contact with instructors, a high level of course approval by students, and group output that matched or exceeded that of a traditionally taught course. The group discussion format had been redesigned to operate via computer-managed communication. The possibilities of technology for education are staggering, and it is this state that we are struggling to define and implement within the existing theories of education.

Theoretically, computer use in education may take a place in educational learning theory based on the concept of "Constructivism", a theory of cognition generally thought to be built on the educational philosophy of Jean Piaget. Von Glaserfeld (1996), defines Constructivism this way, "...the idea that what we call knowledge does not and cannot have the purpose of producing representations of an independent reality, but instead has an adaptive function." (p.3). This adaptation was seen as the ability to thrive, given the particular conditions and constraints of the world in which one happens to be living. Piaget noted that whatever knowledge was, it was not a copy of reality. Social learning theory as described by Bandura in 1977, can still be seen to apply where people interact in computer-based ways. According to this theory, the powers of human observation lead to learning complex and highly integrated behaviours from others. Bandura theorized that individuals have a self-directing capacity by which they select, organize and transform aspects of their environment important to them (Bandura, 1977). The implications for teachers and technology are serious. For instance, how students see their environment may be different than intended by educators; this environment includes, more frequently, computers. Educators are as yet uncertain of the entire spectrum of learning taking place in this environment; the implications for language and meaning, and the actual process of transfer of knowledge is, from the view point of technology in the classroom, largely in the hands of the students. Constanzo (1989), reminds us that the

computer is much more than a delivery system, "...it has greater power to manipulate a message and involve the receiver...It's not just active, but interactive, which is why it can carry on a kind of dialogue, update a database or manage a sophisticated simulation." (p.11). The receiver's job is harder because she or he does not know what the sender of the message knows. Constructivism views the task of the educator as not just dispensing knowledge, but providing opportunities to build knowledge up. In this view, learning is a constructive activity, and this is where computers and their capabilities fit in the greater scheme of education and technology. In educational Constructivism theory, the learner is active, not just reactive.

The search for more efficiency in learning has been called an errant passion (Cuban, 1986), and in the search for this efficiency, educators and others have tried various methods to teach including programmed instruction, film, radio, television and now microcomputers. Cuban defined 'useful instruction' as, "...any device available to teachers for use instructing students in a more efficient and stimulating manner than the sole use of the teacher's voice." (p.4). Press (1993) has found that along with interactive multi-media courseware and portable pen-based computers, computer networks are predicted to have a profound impact on education. They are seen as unique. Bagert-Drowns (1993), notes, "Computers are uniquely versatile instruments...not only can a computer manage visual and aural symbol systems (e.g., text, music, speech, graphics, pictures, and animation), but it can manipulate them in many different ways (e.g., reception, storage, search, display, and many kinds of transformations). Added to these capacities is the speed at which a computer can operate, a speed that can make human-machine interaction dialogical. These features alone would suggest that the computer will make a greater impact on education than the phonograph, radio, television, or other media that preceded it." (p. 70). The fact that overhead projectors are still the most widely used teaching technology in University classrooms reminds us that technology is applied within a system of interrelated political and organizational issues (Press, 1993). While it is not within the scope of this study, there does exist a considerable body of thought which explores and questions the use of technology in the classroom and

computers in particular, their value in education and the workplace (Burstein & Kline, 1996; DeKercknov, 1995; Noble, 1984; Press, 1993; Postman, 1988; Sardello, 1985; and Sloan, 1985).

Understanding Electronic Mail

In the late 1960's, the U.S. Department of Defense, through its Advanced Research Projects Agency (ARPA), established the first large-scale computer network. Originally funded and designed to create computer communication among its university based researchers, a minor feature called electronic mail soon developed. It quickly became one of the most popular features of ARPANET.

ARPANET was originally an experiment inspired by J.C.R. Licklider, a scientist at MIT. At this time computers were still generally thought of as nothing more than giant calculators. This nationwide network grew from four initial locations in the United States, and while it was not the only digital network being developed, the U.S. government's was the largest and most sophisticated network experiment in the world. In fact, as far back as 1973, a study done by ARPA found that three-quarters of all traffic on the ARPANET was email. Hafner and Lyon (1996), have chronicled the development of email and postulate that, "As a cultural artifact, electronic mail belongs in a category somewhere between found art and lucky accidents. The ARPANET'S creators didn't have a grand vision for the invention of an earth-circling message handling system. But once the first couple of dozen nodes were installed, early users turned the system of linked computers into a personal as well as a professional communications tool. Using the ARPANET as a sophisticated mail system was simply a good hack." (p.189). As protocols were developed, a number of accidental discoveries were made including email (Hafner & Lyon, 1996). Some network administrators objected to email because they did not see it as a vital use of computer time (Watts & Castle, 1992).

Electronic mail is similar to hard copy text-based communication in various ways, such as the fact that it has to be sent, addressed, and is serial in nature. It is, however, different in several important aspects, including speed and perceived informality (Stein

and Yates, 1983) and the ability to be transmitted simultaneously to large groups (Rapaport, 1991). The Electronic Mail Association (in Flately, 1992), defines email as, "the generic name for non-interactive communication of text, data, image, or voice between a sender and a designated recipient by systems utilizing telecommunications links." (p.21). There are other ways in which computer communication and traditional communication differ: the screen is an isolated unit; a traditional page has a relationship to the rest of the book; one cannot hold an electronic message in the hand or manually turn a page; a glass separates the reader and the electronic message; a reader cannot touch the words. Finally, there are mechanical devices to operate and maintain, such as a mouse and keyboard. There is, overall, the question of control. Email calls for a new relationship between the reader and the text. Perhaps someday the structure of messages will begin to reflect the nature of computers because written deeply into he fabric of the programmers deliberate design is an internal process dictating the way one must write on an electronic screen.

Particular application of email varies a great deal. It includes everything from local personal notes to collaborative scientific research projects on a vast variety of subjects across great distances.

Many software programs have integrated email systems: the Netscape browser is one example of this increasing practice by computer application developers to include an email system in a large software package. Strategies for teaching the use of email communication to various students, including preservice and inservice teachers, have not yet been widely documented. Several variables concerning this, such as an individual's attitude with computer technology, need to be studied further. This fundamental information would aid the development of curriculum instruction and teaching strategies, as well as provide valuable insight into the learning needs of present and future teachers. Empirical research on electronic mail has been somewhat limited but this is slowly changing as evidenced by the number of studies in recent years (Bruning, 1994; Herling, 1994; Lincoln, 1992; Miller & Olson, 1994; Russell, 1995; and Sondak & Sondak, 1994.).

A network structure for using email has been available in the Faculty of Education, University of Manitoba since 1988, with the introduction of the Novell 368 operating system.

The purpose of this study is to investigate the use of email technology by the full-time teaching faculty: who is using email, for which purposes and how do users feel about this technology?

Educational Significance of the Study

By investigating and assessing communication in an electronic environment within a particular setting, we can ascertain the various patterns of use and the purposes for which educators are using email. University faculty who use computer technology interacting with and teaching their students, serve as models for students (Komsky, 1991). If we agree, and not all educators do, that email is a useful technology which our students should learn, we must model a positive attitude toward it. Asking questions about faculty members' use of email in their work provides us with the basis for understanding the possibilities and limitations of this emerging technology. Curriculum designers, administrators, university instructors, teachers and pre-service teachers all look to the available research for guidance and answers about what to teach and how best to teach. Any broadening of an area of communication used in schools is of value to society as a whole. As Ruberg and Miller (1993) point out, the people using this technology are those who will define and redefine the nature of the online communication process. How the electronic communication process evolves depends on how individuals using the system apply the technology to meet their needs.

Organization of the Study

The data collected in this study was obtained in May of 1997 in Winnipeg, Canada. The survey was designed to ask four primary research questions of the full time teaching faculty in the Faculty of Education at the University of Manitoba.

- How widespread is email use in the Faculty of Education, University of

Manitoba?

- How is email being used in the Faculty of Education, University of Manitoba?
- What are the attitudes of the Faculty of Education, University of Manitoba members toward email technology?
- What are the demographics of email use in the Faculty of Education, University of Manitoba?

This was a status study which basically determined the existing status quo. The survey consisted of 67 questions.

There were two sections from which the measurement of variables were obtained. The independent variables were: demographic characteristics such as gender, number of years teaching, area of professional interest and home department at the University of Manitoba. The dependent variables were: attitude toward email technology and the uses of email. These were organized according to basic functions of use. This included work or social use and level of use.

The targeted population considered for this study in the Spring of 1997 was the full time teaching faculty with at least 10 month term contracts at the Faculty of Education in the University of Manitoba campus. Basically this was a cluster sample. A cluster sample is a method employed by researchers when it is feasible to select a specific group of individuals (Cates, 1985). A list of the faculty was obtained from administrators at the faculty and the entire sample surveyed. As a cross-sectional design, the data is collected only once and cannot be used to measure change since the individual is measured only once. The population numbered 41 individuals. Responses were requested concerning email use, attitudes toward email technology, and demographic information. The selected population was first sent a pre-survey letter informing them of the survey. One week later the subjects were sent a questionnaire with an accompanying cover letter and a self-addressed envelope. After one week the subjects were sent a follow-up letter. As a final measure, in late May, the subjects were sent a letter requesting participation in the survey. In total, four letters were sent to the subjects. The respondents were requested to return the completed survey within two weeks.

The survey instrument was informally test piloted by three senior Education graduate students, and several structural changes were made to facilitate ease in answering the survey. Individuals similar to the intended respondents are recommended for pilot studies of any design (Wiersma, 1991). The informal pilot run was conducted in March, 1997. Dr. Paul Madak (research methodology), Faculty of Education, University of Manitoba, reviewed the survey instrument and statistical analysis. The purpose was to check for ambiguity, confusion and poorly prepared items. The Statistics Department, University of Manitoba was consulted and provided the structure for statistical analysis.

Descriptive statistics displayed the findings; cross tabulations for the demographic data, frequencies and percentages overall, were used to analyze the data. The data which was collected by questionnaire was nominal and ordinal data. The research design was ex post facto, a systematic empirical inquiry where the scientist does not have control of the independent variables. Kerlinger (1973) explains: "Ex post facto research is systematic empirical inquiry in which the scientist does not have direct control of the independent variables because their manifestations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made without direct intervention, from concomitant variation of independent and dependent variables." (p. 379). The survey contained one open-ended question; the rest of the questions were structured-response in design. Doing this kind of research in particular areas of the behavioral sciences makes sense since research problems on these disciplines are not easily adapted for experimental inquiry.

Inferences have been made about the relationship among variables since independent variables cannot be manipulated. Some control was gained through subject selection and statistical analysis for validity purposes. The independent variables were the demographic characteristics: number of years teaching, gender, area of professional interest and University of Manitoba teaching department. The dependent variables were the respondent's attitudes toward email technology and use of email technology. These have been categorized according to essential function of use. This function of use included task/social use and level of use. Responses were requested to provide

information concerning email use, attitudes toward email technology, and demographic information.

Purpose of the Study and Research Questions

The purpose of this study was to investigate email communication by the full time faculty members of the Faculty of Education, University of Manitoba. This study attempted to provide a profile of email usage patterns by the faculty members in the spring of 1997. This study first gathered information concerning the functional use of email, and demographic details supplied by the faculty. The study then explored the relationship (if any), between the use of email as a technology and the full-time faculty. In short, the study attempted to determine if particular characteristics would predict variables for explaining email use and attitudes to email technology. Four basic questions drove this study, namely:

- How widespread is email use in the Faculty of Education, University of Manitoba?
- How is email being used in the Faculty of Education, University of Manitoba?
- What are the attitudes of the faculty toward email technology?
- What are the demographics of email use in the Faculty of Education, University of Manitoba?

More simply, the central issue was how email is being used by the faculty, who was using it for what purposes, and how did these individuals feel about the technology?

As educators, we need to ask questions which will provide information on the complex behaviour required when using new computer technology. Email use is particularly interesting because the kinds of skills required for communicating via email are very different from other traditional text based operations (Roberts, Blakeslee, Brown, and Lenk, 1990).

This study was inspired by a doctoral dissertation done by Jerry Kandies at the Virginia Polytechnic Institute and State University in 1994 entitled, Electronic Mail: Attitudes, self-efficacy, and effective communication. A copy of his survey instrument,

modified to a large degree for this study, can be found in Appendix G. Kandies' instrument was a 60 question survey of 250 faculty members at the Virginia Polytechnic Institute and State University. His study found that certain variables, such as attitude, age, and experience using technology relate to different levels of work and social use of email. In particular, how useful an individual found email correlated with how much the email technology was used. A portion of Kandies' questions have been used in this study and permission to do so has been obtained. This study will integrate the findings as they relate to email technology into the existing body of knowledge on computers in education.

Questions about the key elements of email technology and how people use and feel about the technology are important to ask because previous research has shown that initial exposure to computer technology, inadequate training in understanding and using computers and resistance to change and new technology have been cited as reasons to explain negative attitudes toward computers (Dambrot et al., 1985). Underlying all this is the realization that the computer is moving away from its role as a mere productivity tool and further into the realm of a human communication aid (Schaefermeyer & Sewell, 1988).

De/limitations of the Study

Delimitations of the Study

Delimitations are those restrictions which the researcher selects in order to keep the study to a reasonable size and scope. This study is delimited in design and execution by the following:

- The survey sample - the population of one Faculty in a mid-sized Canadian university delimits the generalizability of this study. Findings about email communication at other similar universities or organizations should be avoided.
- The data - the data used for statistical analysis was delimited to that collected from the full-time teaching and sessional faculty with at least 10 month term

contracts in the course of their work setting.

- The survey is delimited to a mail questionnaire.

Limitations of the Study

Limitations are those aspects over which the researcher has no control. The following applied to the design and implementation of this study:

- The sampled population were urged to respond but 100% participation was not guaranteed.
- The success of the survey depended largely upon the validity and reliability of the data obtained from the questionnaire.
- It is assumed that survey respondents offer honest and unbiased answers and that they answered only one survey.

Definition of Terms

Electronic Mail

A non-interactive communication using text, data, or designed image between a sender and designated recipient(s), by systems utilizing telecommunication links (Flatley, 1992).

Computer Managed Communication

Use of a computer in a supervisory or managerial rather than a teaching role; the computer prescribing work schedules, assessment, student records, etc. (Ellington & Harris, 1986).

Attitude

This can refer to a learned disposition towards responding to an object in a consistently favourable or unfavourable manner (Igbaria and Chakrabarti, 1990).

Chapter Summary

This chapter presented a case for the study of email usage by the full time faculty of the Faculty of Education, University of Manitoba. The subject and history of email was introduced as well as a theoretical framework of computers in education. The

background and organization of email in general was discussed followed by a section concerning the educational significance of the study. Following this was the purpose of the study and the research question, de/limitations of the study and a definition list of frequently used terms. The research paper is presented in five chapters. The organization of the study is as follows:

- Chapter One defined the problem of the research study and delineated the questions for investigation.
- Chapter Two reviewed the literature and was undertaken to build a conceptual framework for the study to justify the choice of variables and methodologies and to target areas of further research.
- Chapter Three described the design methodology, data collection procedures and statistical analysis of the data.
- Chapter Four described the primary research outcomes by recounting the statistical analysis of the data.
- Chapter Five suggested conclusions and recommendations derived from the findings and data analyses reported in Chapter Four.

Appendices include the survey instruments and all correspondence.

Chapter II

LITERATURE REVIEW

A review of the relevant literature was conducted to outline and refine the four basic research questions of this study. This literature search was also useful in justifying the choice of variables and rationalizing the research methodologies.

The studies are grouped into categories:

- literature about the various purposes of email
- literature about the attitudes of individuals toward computers and computer technology in general
- studies involving characteristics of email communication
- demographic literature

Email Use

The purpose of this section of the literature search was to identify the scope of a dependent variable - email use.

Education

The literature in the field of computer/technology use in educational settings up to now has tended to stress the medium's instructional potential rather than suggesting a protocol for designing virtual environments (Dennen & Branch, 1995). Ruberg (1992) categorized computer-managed communication into content areas of education such as language arts, social studies and science education. He noted that computer-managed communication could benefit learning in other important ways. For instance, basic computer literacy skills can in turn foster a positive student attitude toward technology. An example of this can be found in Britian's Free University where many of the students are home-bound and use technology to enrich their interaction with tutors and fellow students. Ruberg itemizes computer-managed communication as able to encourage

student to student, student to teacher writing, on-line database searching and other collaborative projects organized around information gathering and record-keeping, activities which Ruberg catagorizes as computer-managed communication. He notes that, "Frequently educational applications of new technology stimulate creative instructional methods for delivering information." (p. 6).

The fact that networks provide widespread accessibility changes the way students and faculty conduct research. One study designed to collect information about the future of email communication in a higher education setting found agreement from 35 faculty members about the future applications and the problems to be overcome. The most useful applications were found to be distributing class material, answering study questions, sending and receiving students assignments, cooperative student work, distribution of grades, file transfer of assignments and academic counselling (Holden & Mitchell, 1993). Udegrove (1991) found that University faculty use electronic mail to support research, teaching and administrative activities. Among their activities were joint grant proposals, collaborative research projects, responses to conference solicitations, supervising thesis students while on leave and communication with colleagues. Science education users were found in a 1993 survey to use email to conduct joint projects, stay in touch with their office while travelling and search for new research (Hesse, Sproul, Kiesler & Walsh, 1993). One study (Hesse, Sproul, Kiesler & Walsh, 1993) gives perspective though, by pointing out that research has not yet been able to prove that network use causes productivity to increase since any observation has to track a moving target: networks and resources available are changing while at the same time populations of users are changing (p.91).

A discussion of the growing importance of email among academics can be found in Hawisher & Moran (1993), as well as a comprehensive argument for research into the issues inherent in email. The authors do not believe that email will eventually supplant paper-based communication. Inherent in the rhetoric of email are issues such as the 'structure' of the message, "Whatever the ways in which one chooses to organize an e-mail message, such structuring and planning runs counter to the spontaneity and fluidity

of the medium." (Hawisher & Moran, p.630, 1993). Should one use a written or spoken language style? The fluidity of evolving conventions, gender, race and class suggest different attitudes towards an electronic medium which could be explored. The authors write that a pedagogy which includes email should be project-oriented and cross-disciplinary. "Research suggests that on-line collaboration works best when there is a project that the group must complete. In particular, 'flaming' is absent from on-line groups that are working on clearly defined tasks (Ferrara, Brunner, and Whittemore; Neuwirth et al.)".

The speed of email communication is often cited as its major advantage to 'snail mail'. Not all would agree with this, however. Clifford Stoll, in Silicon Snake Oil writes, "Well, along the way, several things delay e-mail. Links may be down, so the packets get queued or rerouted. A computer might be especially slow, so it doesn't get around to forwarding the mail. Some part of an address may not fit the format of a distant machine, and so requires additional attention. Or the destination computer may not be in service." (p.162). In fact, even with the increasing vastness of the Internet and thus email communication possibilities, volumes of paper-based mail are still increasing at rates of 1% - 3% each year according to Canada Post (in Carroll, Broadhead, & Cassel, 1997). Features of email, other than speed, have been examined. For example, organizational functions such as group communication can increase efficiency. A 1991 survey (Komsky) of 500 members of a large suburban American University, which included administrators, support staff and teaching faculty, found that, "...electronic mail will be most attractive to organizational members who spend a lot of time on the telephone with other members and who are willing to substitute email for telephone tag." (p. 331). The researcher of this particular survey sought to identify differences between frequent users and occasional users. Five hundred electronic surveys were sent out and 220 returned to the researcher. Results indicated that frequent users seemed to ignore system problems to a greater extent, seemed to be predisposed toward mediated communication in general and more accepting of electronic mail as an alternative to telephone communication than occasional users. Eighty-seven percent of the sample liked email as a medium of

communication.

Education faculties with computer networks have been using the technology in various ways. Stahlhut & Hawkes (1994) found that traditional barriers between student teachers, practicing teachers and University faculty tended to disappear when all were connected by computer networks. New collaborations and relationships developed as a result of the computer conference system called Cobra, first tested in Iowa in 1988. "Student teachers probably realized the most benefit from this network. When you student teach the norm is to ask for all the help you can get." (p. 7). Another educational setting, the Curry School at the University of Virginia, uses email to support the educational process and link student teachers, faculty and supervising teachers. Email has become part of the educational culture there (Bull, et. al., 1989).

The structure of corporate organizations tends to lend itself to research study on email communication. Sherbloom (1988), analyzed the middle-management email content of one such large corporation during a period of several months. The email communication functions analyzed were organized into type of function (social or business), direction of message within the company (vertical or horizontal) and the presence of a signiture (indicating heirarchal position). The results indicated that 80% of the 157 messages analyzed involved informational functions but all functions had been used at least once. Other functions included complex communication activities involving personal, social and influence attempts. This study also found that email moving in a vertical direction was much more restricted to informational and administrative functions than email moving in a horizontial direction (p. 49). A different study (Alexander, Helms & Curran 1987), classified the email functions into even more specific groupings. For instance, "administrative communication" was a category used which included meeting announcements, requests to meet, acknowledgments, reminders and the minutes of past meetings. Sproul and Kiesler (1991) wrote an article discussing how email is used to coordinate group work. In their article administrators used it primarily to arrange time and place of meetings, and to assign tasks for individuals and sub-groups. Reports can then be circulated and all group members can be kept in the informational loop quite

easily by forwarding and summarizing information.

Summary of Education Email Use

The above discussion looked at the various patterns of email use by individuals within the specific areas of education and business. A wide range of use is obvious. People are using email to do traditional tasks in new and perhaps faster ways and to create new activities such as accessing global networks. Traditional methods of communicating such as the telephone or postal mail are occasionally replaced in the interests of speed, distance and efficiency, particularily with large groups such as University faculties, schools and businesses. In some cases email use is particular to the area of subject or profession, but a pattern can be found across the board, such as scheduling meetings.

Attitudes Toward Computers and Computer Technology

Attitudes are evaluative beliefs (Mathews & Wolf, 1983). They are our affinities for and aversion to situations, persons, or identifiable aspects of our environment. Francis (1993) has outlined a research agenda concerning attitudes toward computers. Francis (1993) summarized the major studies conducted and a broad range of questions have been asked. Among them are: a) the relationship between computer attitudes and locus of control, b) the relationship of computer attitudes with sex, math anxiety, math aptitude, computer aptitude, and experience with computers, c) comparisons of the attitudes of students and non-student working adults, d) the relationship between computer attitudes and personality traits and, e) the effects of computing courses on pre-service teachers. The past 15 years have seen a solid body of research directed to the area of attitudes to computer technology. The growing personal computer field began to generate real interest for researchers in various disciplines (Mathews & Wolf, 1983). Those which were deemed most pertinent for this study were reviewed, namely studies that looked at perceived usefulness of computers, computer anxiety, computer experience, training and demographic variables.

Usefulness

Usefulness has been characterized as 'compared to effort to use', since the effort one has to spend in learning a new tool is related to the usefulness of the tool. Several studies have investigated the construct of usefulness in relation to an individual's attitude (Byrd & Koohang, 1989; Clement, 1981; Herling, 1994; Koohang, 1989). How well computers were accepted in the workplace affected attitudes to usefulness. Those who used the computer for a variety of tasks such as word processing and spreadsheets were found, in several studies, to have a positive attitude toward the usefulness of computers (Byrd & Koohang, 1989; Kinsie & Delcourt, 1991). Wingand, in 1995, investigated the influence of information technology, specifically email, on the administration of a large public University in the United States. The results of this study found that email use increased for simple and routine tasks and decreased for ambiguous, complex and non-routine tasks. The 'effort to use' (usefulness) provided a direct relationship between the respondents' level of use and the perceived usefulness of email Krishnamurthi (1996) found that email choice as a process was not objective and rational. Organizational and management forces defined and constrained appropriate use.

Two studies found a positive attitude to computer usefulness expressed by computer users with experience in the technology (Byrd & Koohang, 1989; Hignite & Echternacht, 1992). Herling (1994), conducted a study which examined the adoption of computer communication technology by a college faculty, and found that only a little more than half of the respondents reported using computer services even though the services were provided free of charge and without access barriers.

The varied results of studies investigating the use use of email indicate that further research is needed into this evolving technology and its impact on human communication.

Computer Anxiety

People react very differently to new technology and attitudes vary considerably among individuals and organizations as they strive to implement emerging technology.

Computer anxiety may be as significant a factor as a lack of skills in computer acceptance and use (Torkzadeht & Angulo,1992). Any time human communication changes, we tend to see a lag in use. Perhaps this is not so surprising. One of the earliest students of resistance to new technology, Bernhard Stern, wrote in 1932 that, "An innovation...rudely shatters whatever equilibrium a person has attained. It demands not only a motor reconditioning but reorganization of personality to meet the needs of the new situation. It is little wonder that an innovation...provokes feelings of impropriety, and repelling defense attitudes of ridicule and disparagement, or is deliberately ignored." (p. 61).

What is computer anxiety? In an effort to define this, Torkzadeht & Angulo (1992) reviewed more than 30 years of research on the subject. The conclusion reached was that an individual experiences stress, such as tension or anxiety, when it is caused by anticipating using a computer. It has been compared somewhat to test or math anxiety. Three categories were identified as perspectives for computer anxiety: a) psychological, which included people fearing a threat to their ego or loss of power/influence, b) sociological, in which fear of not interacting with people or keeping up with technology caused anxiety, and c) operational; fear of embarrassment when unable to operate tools caused lack of computer use. Russell (1995) reviewed various studies concerning computer anxiety and computer literacy. She found that the literature pointed clearly to a relationship between the two. "A computer anxious person will take longer to become email literate than a computer literate person..." (p.172), since anxieties often occur in areas where an individual is learning something new and this in turn causes a resistance to change. Another study suggested that it is a broader anxiety that relates to the technology of computers, thoughts about computers or attitudes toward technology in general (Kolehmainen, 1992).

Measures of Computer-Related Attitudes

The 'father' of attitude measurement (Thurstone, 1927) supposedly shocked the academic world when he suggested that attitude could be measured at all. Since 1927

there does not appear to be a consensus among researchers about just what it is that an attitude scale measures. However, two schools of thought prevail. One speculates that attitude consists of three aspects: the affective, the behavioral and the cognitive. The other school of thought believes that attitude measurement takes place in the affective domain only and that behavioral and cognition should be measured separately (Francis, 1993). LaLomia & Sidowski (1993) express concern in particular for an apparent lack of a theoretical basis for a majority of the scales used to measure attitudes.

Loyd & Gressard (1984 a.) developed a computer attitude scale to measure what they believe is an important role in computer programming, an instrument that measures attitudes toward computers and attitudes toward learning computer technology. In 1990, Kinzie and Delcourt developed a similar scale to measure usefulness and comfort/anxiety with computer technology. Again in 1991, Kinsie and Delcourt developed and validated two instruments by which attitudes and self-efficacy of the teacher education students and practicing teachers toward computer use can be measured. Other populations could be measured by modifying the 19 and 25 item instruments. The measurement of attitude is still the subject of much academic discourse.

Summary of Attitudes Toward Computers and Computer Technology

Attitudes have long been recognized as important predictors of individual differences in educational application, learning and achievement. While there is a wide variety of studies available on computer attitudes, only those which were thought specific to this study were explored. Research that concerned usefulness, anxiety and experience were used, since usefulness and anxiety are two factors which seem to have the most impact on computer use itself. Individuals were more likely to perceive computers as being useful if they had experienced a variety of programs or were in an information-intensive environment. An individual's training and experience had the most influence on how much anxiety was experienced. Anxiety was characterized as a threat to an individual's ego, embarrassment or fear of little human contact.

Characteristics of Email Communication

Early Email Research

The developing rhetoric of email reaches back to the medieval *ars dictaminis*, to the letter-writing handbooks of the Renaissance leading eventually to style manuals published today (Hawisher & Moran, 1993). A complete rhetoric of email would include a full context, such as genres, audiences, voices, uses, influences, drawbacks, specific environments and attitudes.

Schaefermeyer & Sewell (1988) provide a review of early studies done on email use within the structure of email as computer-managed communication. Early studies found email used primarily in organizational situations. Users thought email was best used when privacy and sensitive communication were not required. Rice and Case (1983) found that increased experience with computer technology did not lead to increased use. Picot et.al. (1982) found that electronic text was viewed as less confidential, more accurate and formal, but less dependable, private and stimulating than face to face communication. Love and Rice (1985) wrote a content analysis study of transcripts drawn from a computerized bulletin board. They found that 30% of the total message content was social and 60% was task oriented. Steinfield (1983) concluded that new and younger employees in a large business organization were more likely to use email for entertainment and non-task activities. He concludes that while some research has been done on new applications of the technology, "...educators and home consumers are among the potential users who might benefit from further research on applications in non-traditional settings." (p. 190). In business, however, email had become such a part of the daily routine that in 1985 the Rand Corporation sponsored a publication titled 'Towards an Ethics and Etiquette for Electronic Mail'. (Hawisher & Moran, 1993, p. 628).

Email Communication

There is little doubt that email is a new form of communication. Just what is

email, though? It is not a telephone call, it is not a letter, it is not a fax or a voice mail message, so what are the characteristics of email? Email has been around for 15 years or more, and we still have little information about this technology that links us personally to the rest of the world: "With a simple Internet e-mail address, it is said that you can reach an estimated 60 million people around the globe" (Carroll, Broadhead, Cassel, 1997, p.111). From an educational standpoint, we appear to be approaching the threshold of an 'invisible college', where "...the limitations of information exchange and scholarly inquiry are no longer controlled by campus boundaries or access (as author or listener/reader) to academic texts, journals, and conferences." (Schaefermeyer & Sewell, 1988, p. 113).

Email differs from traditional communication techniques in several ways. Email is characterized by its immediacy - it takes place in 'real time'. This format works well for collaborative groups because it is faster than a letter (Nunamaker et al., 1991). This speed can also allow for more precision which make it an efficient tool for work settings (Flately, 1992). These characteristics separate email from traditional typed documents and make it a distinct model of communication.

Text written on a computer differs from paper-based hand written text. In fact, Jonassen claimed in 1982 that, "In a decade or so, the book as we know it will be as obsolete as is moveable type today." (p.379). Electronic text is less sequential, more of a hierarchy, and less continuous (Constanzo, 1989). Spatially, electronic text is different because fewer words will fit one screen than a sheet of 8 1/2" x 11" paper (Hartley, 1987). Generally only 20 lines of text can be fit onto a single screen. Between 50 - 65 characters in a line of print is easier to read than 80 characters often used by computer programmers (Rubens, 1987). Consider the problem in contrast between letters and the background screen, flicker, reflection and blurred image. These areas remain to be investigated more thoroughly, but the fact is that a white page will reflect light while a computer screen produces light. A paper page is able to hold 4 screens. The average page can fit 3,000 characters but the screen just 1,920 characters. When compared to face to face communication email can make a point quicker, allow more time for composition

and can be more spontaneous (Hesse, Werner & Altman, 1988). Another researcher found email to be more concise, logical, organized, careful, serious, depersonalized and less emotional, friendly, personal, relaxed and spontaneous (Compton et al., 1991). Studies have detailed evidence that writers tend to be more candid (Sproul & Keisler, 1991) and make more errors such as those one makes while speaking aloud (Constanzo, 1989). In writing to a screen, writers can lose the sense of audience, drift into self-absorption and lose constraints and inhibitions that an audience provides (Hawisher & Moran, 1993). The screen is, overall, more complex and independent than a traditional paper page.

It can be a drawback for email writers to have to use a user interface to send email: "A strict definition of Internet email is that it consists of email sent and received from computers directly connected to the Internet. Strictly speaking, it is email based on SMTP (simple mail transfer protocol), the software that defines how messages should be sent between different computers on the Internet." (Carroll, Broadhead, Cassel, p. 112, 1997). The writer may, at first, find the environment unfriendly and have to face problems such as 'down time' or various other glitches (Komsky, 1990). The much touted 'speed' of email can be seriously decreased by the user or the technology in a variety of ways, including technology glitches, address formatting and power outages, to name a few. Email seems to both require and expect a quick response. Andrew Feenburg (1989) writes, "Communicating on-line involves a minor but real personal risk, and a response- any response- is generally interpreted as a success while silence means failure...As a result, when we leave a message in computer memory we feel an intense need of response." (pp.23-24). However, certain literature has shown that the advantages of speed outweigh the possible problems (Grantham, 1991; Harasim, 1990).

In the absence visual human cues, an 'emoticon' is sometimes used; a smiley face [:)] or other extraneous comments [<grin>] attempting to provide information to the receiver of the message (Flately, 1992). Grantham (1991) reports that, "The use of electronic forms of symbolic communication is increasingly the band-width of human computer interaction. Images, graphs, charts, and iconic symbols are routinely used to

facilitate communication." (pp.21-22). A survey conducted of 215 email users in the insurance industry found, through multiple regression analysis of the returned data, that 21% of the variation in email use could be explained by aspects of uncertain tasks, such as symbolic meanings of trust or goodwill (Drew, 1996). People were unsure of how to communicate subtle aspects of human interaction. These emerging capabilities of the technology will allow other forms of non-text communication in the future; perhaps graphics used to enhance understanding of certain concepts that are difficult to convey verbally. Email communication differs greatly at the organizational level as well. Most particularly affected is the hierarchical structure of an organization since anyone can send a message to anyone else and communication becomes less top-down (Sherblom, 1988). Senior level administrators at a large U.S. university reported using email more often per day than lower level administrators and used it more for horizontal than for vertical business communication (Wigand, 1995). Academic structures have generally found this construct to hold as well (Dubrovsky, Kiesler, & Sethna, 1991; Sproul & Kiesler, 1986).

The traditional office secretary is being replaced in computer technology as it pertains to email with 'Robot Mail'; a system which is programmed to extract, reply and sort certain email messages and addresses thus eliminating the vast possibilities of email 'junk'.

Summary of Characteristics of Email Communication

The distinct characteristics of email written communication are integral to the successful or unsuccessful use of the medium. As a new mode of communication, email is not simply a technology issue but a human communication one as well.

Early studies pointed to a significant number of concerns regarding privacy and types of usage, generally social and work-related use. Some of these studies found that use of email was more socially oriented. Other research investigated early email use by business organizations and found use primarily focussed on efficiancy matters. One must look at technicalities such as computer screen size, writing style and the other many ways in which computer communication is different from traditional forms of communication, as being important considerations when investigating email use in large institutions.

Research on how email communication differs from current and early forms of communication is important because this study is investigating members of a large organization concerning attitudes and use of the medium.

Demographic Variables

Gender

The number of studies concerning gender differences in attitudes toward computers is considerable. A 1993 review by Shashaani found gender differences toward early in school years and that the differences continued through high school and University years. Men rated a high level of self-confidence (Shashaani, 1993) and women rated higher levels of anxiety (Igbaria & Chakrabarti, 1990). A fair body of research concurs that there is a difference in attitudes to computers between the sexes, but few studies concur on the causes. A great deal of discourse exists from various intellectual perspectives. Much of the research cited on previous pages of this chapter concerning attitudes and use of computers also included a section on gender as a variable. Differences in the way in which men and women use computers have been noted. Turkle (1984), in particular, found women to be more 'applications oriented', while men preferred programming. "Our data points to discrimination in the computer culture that is determined not by rules that keep people out, but by ways of thinking that make them reluctant to join in." (p.132). Another study concerning gender differences and computer use in the workplace, in this case, university faculty, reported more use by women of word-processing, data entry, teaching application and information storage and retrieval. In the same study, men reported more use of financial applications, data base management, inventory systems, programming and statistical applications (Lowe & Krahn, 1989). Krishnamurthi (1996) wrote in a survey paper that women preferred to use email for aspects of ambiguous tasks, such as conflict resolution and persuasion. Men and women did not differ significantly in the use of email, however the reasons for use were found to be different. Selfe and Mayer's 1991 study of an email discussion group

for writers found some evidence that men and 'high status' participants dominated the discussion. A follow-up study of two typical classroom settings, Hawisher and Selfe (1992), found that among the students, neither the amount of discourse nor the degree of verbal assertiveness could be consistently associated with gender or status. Kinsie and Delcourt (1991) completed a study of 328 students in the United States who were attending a school of education. They wanted to measure the attitudes of students to new technology; results of repression anlaysis on the data indicated, "...the relative unimportance of demographic variables (such as age, sex, or current educational level) in predicting attitudes toward computer technologies, ..." (p. 10).

Experience

Experience is sometimes included by social scientists when studying personal characteristics. The amount of experience one has had using email can reflect the amount one uses it for work or non-work. Igbaria & Chakrabarti (1990), Kinzie & Delcourt, (1989) and Koolang (1989) all found that experience presented a significant variable. Zandri & Charness (1989) focused on effective methods for training adults to use email application software. They reported that older individuals (aged 50-84) took twice as long as younger individuals (aged 20-39) to acquire the skills. Ertmer (1994) conducted a study of undergraduates completing email and word processing tasks. This investigation found that experience affected the student's use of technology for education. She found that quality, not quantity, of computer experiences were more critical to successful use by analyzing the content of messages by university students in two computer courses over one term.

A recent doctoral dissertation (Kim, 1995) found, in an empirical research study of a large business, that experience with telecommunication technology had a direct and significant relationship with the individual's level of use. His study surveyed and and interviewed 280 individuals from 12 organizations. The results of this study found that individuals were influenced if others were using email. The perceived advantages of email were found to be the most significant predictor of email use. The perceived

complexity of email functions did appear to have a modest relationship with the individual's use. This study also found that previous experience with computer technology showed a direct relationship with the level of use by individuals. The results of a 1991 study (Kinsie & Delcourt), found that 328 education students' experience with computer technology is a strong predictor of how individuals viewed technology. "Actual experience with computer technologies, either in a course or in regular use, was a strong predictor of both 'anxiety/comfort' and perceived 'usefulness.'" (p.11). Kinsie and Delcourt developed a Likert scale and administered this to 328 undergraduate and graduate students enrolled in the Education Faculty of a large American university.

Parry and Wharton (1995) conducted a survey involving 73 faculty members in a mid-sized, mid-western state supported university in the United States. Questionnaires were mailed out asking about the respondents use of email, demographic details and attitude toward computer technology. This study did not find any indication that gender predicted computer usage by the faculty. Male and female colleagues were equally likely to use the network and express feelings of expertise. Age, however, did appear to play a role. Younger faculty members were more likely to use certain network options. "Nevertheless, gender and age offer little explanatory power. Therefore the researchers propose that other factors must be considered when attempting to profile the 'typical' network user." (p. 468).

Summary of Studies of Demographic Variables

Gender and experience are typical variables in studies about computer use and computer attitudes. A significant difference in the anxiety levels of female and male technology users has been found. The attitudes of female/male technology users has been found to be different, but the reasons for this appear to be varied. Differences in the various ways in which females and males use technology have been noted. Perceived 'status' and gender of individuals in an organizational heirarchy reports differences in technology use and attitude. Experience with computer technologies can effect how often an individual utilizes email. In most studies gender tends to assert a notable variable

difference in attitudes to and use of computers.

Chapter Summary

Quantitative methodology is generally used to research areas of email use, individual attitudes to computers and the computer technology itself. Research about email characteristics is usually qualitative. This literature review explored theoretical concepts, variables and methodologies involved in this study. Using email effectively in schools will require teachers, curriculum and instructional designers to have a solid body of research on the subject to help them understand the complex relationship between technology and its clients. This is a particularly relevant issue when we consider that University faculty influence students both in the classroom and through role modelling. If they are the people who are preparing students for emerging technology, the extent they use the technology themselves is important.

This chapter looked into the use of email, attitudes toward the technology, the particular characteristics of email, and demographic studies concerning gender and experience with technology.

This study attempted to add to the demographic body of knowledge about existing relationships with respect to a specific computer medium - email.

Chapter III

RESEARCH METHOD AND DESIGN

This chapter will describe the research design and methodology used in the study. The sample size, instruments used, method and procedures of data collection and participant inclusion criteria are presented. The basic study is designed to find out more information about the functional use of email by full-time teaching and sessional education faculty with at least 10 month term contracts in the University of Manitoba, Faculty of Education setting. The four research questions driving this study are:

- How widespread is email use in the Faculty of Education, University of Manitoba?
- How is email being used in the Faculty?
- What are the attitudes of the Faculty toward email technology?
- What are the demographics of email use in the Faculty of Education, University of Manitoba?

Design

The research design of this study is, *ex post facto*, literally, "what comes after". A systematic empirical inquiry where the researcher does not have control of the independent variables. Kerlinger (1973) explains: "Ex post facto research is systematic empirical inquiry in which the scientist does not have direct control of the independent variables because their manifestations have already occurred or because they can not be manipulated. Inferences about relations among variables are made without direct intervention, from concomitant variation of independent and dependent variables." (p.379). Doing this kind of research in particular areas of the behavioural/social sciences makes sense since the research problems of these disciplines are not easily adapted for experimental inquiry. The affective variables, interest and attitudes cannot be manipulated. External variables cannot be controlled.

Inferences have been made about the relationship among variables since independent variables cannot be manipulated. Some control was gained through subject selection and statistical analyses for validity purposes. The independent variables are the demographic characteristics. The dependent variables are the respondents' usage of email and attitude to email technology.

Independent and Dependent Variables

The independent variables were demographic characteristics: number of years teaching, gender, area of professional interest, and teaching department at the University of Manitoba. The dependent variables were: the uses of email, attitudes towards email technology and use of email technology, were categorized according to essential function of use. This included task or social use and level of use.

Population, Sample and Inclusion Criteria

The targeted population for this study is the full-time teaching and sessional faculty with at least 10 month term contracts at the Faculty of Education, University of Manitoba campus in May, 1997. Not included were those on sabbatical, retired senior scholars, or those full-time faculty whose typical office was not in the Faculty of Education building. This cluster sample is a method employed by researchers when it is more feasible to select a specific group of individuals (Cates, 1985). A list was obtained from the administration at the Faculty and the entire sample surveyed. The population numbered 41 individuals. Responses were requested concerning email use, attitudes toward email technology and demographic information.

A consideration for choosing this site for sampling was the relative expense and effort required for the collection of data. Time and travel costs were minimal due to the close proximity of the subjects. The network technology for email use has been in place at the Faculty of Education since 1988.

Instrumentation

The survey is in four basic sections from which the measurement of variables can be obtained. The survey contains 67 questions, including one open-ended question. Some questionnaire items were originally created by Kinzie & Delcourt (1991), Steinfield (1983) and modified later (with permission) by Kandies (1994) for a more specific 'email technology' subject as opposed to the original 'computer technology' subject. The overall instrument was developed for the Faculty of Education, University of Manitoba with the assistance of committee members and informally piloted in March, 1997 by three senior Faculty of Education graduate students. Dr. Paul Madak (Research Methodology), University of Manitoba, was consulted as well as Llwellyn Armstrong from the Faculty of Statistics, University of Manitoba to provide detailed guidance on the structure of the statistical framework and analysis. The quantitative data was gathered through respondent questionnaires. Certain questions were included which were specific to the University of Manitoba. Questions 53, 54, 57, 62, 64, and 65 are specific to the University of Manitoba full-time teaching and sessional faculty with at least 10 month term contracts in the Spring of 1997. A heading asked the respondents to answer first if they used email, yes or no, and then to move to the appropriate starting question to begin the survey. If the respondent answered yes, then the survey began at question number 1. If the respondent answered no, the survey began at question number 63. Of the 67 survey questions, 27 of them are drawn directly and unchanged, with permission, from the 1994 (Kandies) survey. These questions are numbers 2, 7, 8, 9, 14, 25-31, 33, 35-44, 50, 58, 60 and 61. The rest of the survey questions are more general in nature and were developed for the University of Manitoba teaching faculty. Demographic data collected included respondent gender, total years in teaching, home department and professional area of interest A copy of the instrument used in the survey appears in Appendix A.

Widespread Use of Email Technology Scale

1. How widespread is email use in the Faculty?

The first research question attempts to find out information about who is using email and

when they are using it.

- Question 1 asks the respondents to circle a number on a 4 point agree/disagree scale whether or not they use email on a day-to-day basis.
- Questions 12 and 13 ask the respondents to circle a 2 point yes/no scale indicating whether or not they read and respond to email messages.
- Questions 46-49 ask the respondents to circle a 5 part forced-response selection, estimating email activity.
- Questions 50-54 ask the respondents to fill in a percentage, thereby estimating quality and quantity of email.
- Questions 60 and 61 ask the respondents to circle forced response answers to questions about general email use.

Email Technology Application Scale

2. What are the ways email is being used in the Faculty?

Research Question Two in this study addresses the issue of various applications of email technology.

- Questions 14-24 ask about basic functions of email use and respondents are provided with the stimulus phrase, 'I can...', followed by statements such as, 'forward messages received on email'. The items attempt to provide a range of simple to advanced computer functions, answered on the 4 point agree/disagree scale.
- Questions 25 - 44 asks the respondents how often they applied certain functions, such as 'send information to people I know', reflected on a 4 point never/very often scale and a not applicable insert.

Faculty Attitudes Scale

3. What are your attitudes toward email technology?

Research Question Three of this study attempts to reflect how individuals feel about email technology.

- Questions 2-11 reflect how individuals feel about the technology, answered with the 4 point scale of agree/disagree.
- Questions 45 and 55-59 are forced response questions reflecting attitudes to email use at work, technical support and technology learning opportunites.

Demographics Scale

4. What are the demographics of email use in the Faculty of Education, University of Manitoba?

Research Question Four of this study attempts to obtain data about the personal characteristics of email users.

- Question 62 asks respondents to circle an answer on a forced response question about how they first learned to use email.
- Question 63 is the only open-ended question on the survey, asking the non-user of email to respond.
- Questions 64-67 request demographic information about the respondent, using forced response structures.

Data Collection

In keeping with the research design, the researcher developed an instrument which was sent out to the sample population in May, 1997. The questionnaire consisted of 67 questions in total, all requiring a circled response except for one open-ended question. Likert 4 and 5 point scales were used, as well as forced-response items. Completed questionnaires were sealed in an envelope by the participants and left for the researcher in the faculty mailroom. The survey was sent through campus mail to full-time teaching faculty at the Faculty of Education, University of Manitoba with at least a 10 month term contract. The teaching faculty were a cluster sample. This sort of sample included all of the individuals in a particular group. A pre-survey letter was sent to all subjects one week prior to the sending of the survey itself. One week after the questionnaire was sent, a follow-up letter was sent. Respondents were sent an informational cover letter along

with the survey and were asked to reply to the survey within two weeks. A fourth and final prompt letter was sent in late May to the 41 subjects requesting participation in the survey. The results of the analysis comparing key variables is organized in Chapter Four of this study.

Data Analysis

The quantitative data was analyzed using descriptive statistics and non-parametric tests suitable for nominal and ordinal data. The primary statistical tools for analysing the data were cross tabulations, one-way frequencies and percentages. The Statistical Package for the Social Sciences (SPSS) was used for data analysis and all data were entered on to a personal computer. Content analysis was used to search for themes in the open-ended qualitative question. The findings from this analysis allowed the researcher to describe the relationships between variables.

Chapter Summary

This chapter described the study design, the four research questions, population sample, instrumentation, survey distribution, data collection procedures and statistical treatment of survey responses. The Statistical Package for the Social Sciences was used and the open-ended question discussed separately. Chapter Four will discuss the study findings.

Chapter IV

RESULTS

This chapter will outline and present the results from the survey and analyse the data obtained from this questionnaire by organizing the information into a survey matrix designed to answer the four research questions driving this study. This chapter will discuss the demographic information and participation in the study and then present the findings along with appropriate discussion of the data. A summary will follow each of the four research questions at the end of this chapter..

Demographic Characteristics of the Participants

This study involved a 67 question survey of full-time faculty with at least 10 month term contracts teaching at the Faculty of Education, University of Manitoba in the spring of 1997. In total 41 individuals were sent surveys.

Participation

Twenty-three out of 41 possible respondents returned surveys and this resulted in a 56.1% return rate. Gay (1981) stated that, if a researcher did not have a return rate of at least 70%, then the validity of the conclusions would be weak.

It is not known why only 56.1% of the sample responded. One reason may be that classes in the Faculty of Education were finished for the academic year and faculty were busy elsewhere at the time the survey was sent. Non-respondents may be those faculty members who do not use email, since all responses claimed use of email. To reduce the concern for non-respondent bias, analysis from a portion of the non-respondents in the form of interviews might have revealed more information. Further discussion in Chapter Five will outline this approach. The low response rate limits the generalizability of the results because the respondents may be a biased group and the validity of the conclusions that can be made will be weak.

Surveys were sent through campus mail to the 41 faculty members currently teaching with full-time, 10 month term contracts for the University of Manitoba, Faculty of Education. The results of the survey have been organized into the four research questions driving this study. The four questions are: 1) How wide-spread is email use in the Faculty of Education, University of Manitoba, 2) How is email being used in the Faculty of Education, University of Manitoba, 3) What are the attitudes of the Faculty toward email technology and, 4) What are the demographics of email use in the Faculty of Education, University of Manitoba?

Data on the research question are clustered in a survey matrix format where the relevant survey question is situated underneath the appropriate research question heading. A copy of the completed survey matrix and the survey instrument itself with the 67 questions is included in Appendices F and A respectively. A complete table of all the results obtained from the survey instrument can be found in Appendix J.

Research Question 1

"How widespread is email use in the Faculty of Education, University of Manitoba?" This research question asks about the respondent's level of use of email technology. The responses to this first question are presented in the following tables.

Table 1

Respondents who said they use email on a day to day basis

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	21	2	--	--	23
%	91.3%	8.7%	--	--	100%

All possible respondents answered this question and 21/23 indicated that they use email on a day to day basis. All of the respondents (100%) indicated that they agree or slightly agree with the statement that they use email on a daily basis.

Basic level of use including reading and responding to email messages was answered by respondents in Questions 12 and 13. Tables representing this information appear below (Tables 12 and 13).

Table 12

Respondents who can read messages on email

	Yes	No	
Frequency	22	1	23
%	95.7%	4.3%	100%

Table 13

Respondents who can respond to email messages

	Yes	No	
Frequency	23	--	23
%	100%	--	100%

Question 12 (Table 12), respondents indicated that 22/23 can read messages sent to them on email. That is, 95.7% responding subjects agreed that they could perform this function. Question 13 (Table 13), also indicated a high level of agreement, with all 23 respondents (100%) agreeing with the statement that they could respond to an email message sent to them.

From these responses speculation might tentatively conclude that email is being used on a day to day basis for the most part and that subjects are able to perform the two most basic functions of email communication - receiving and sending messages.

Questions 46, 47, 48, and 49 ask respondents about the number and types of

messages they send and receive per week. Tables 46, 47, 48, and 49 reflect this.

Table 46

Number of messages received per week by respondents

	Less than 10	10 to 19	20 to 29	30 to 39	40 or more	
Frequency	–	2	12	5	4	23
%	–	8.7%	52.2%	21.7%	17.4%	100%

All respondents receive at least 10 messages per week with the majority (52.2%) receiving between 20 and 29 messages per week. (Table 46). This compares with the number of messages sent per week, which is less (Table 47, below).

Table 47

Number of messages sent per week by respondents

	Less than 10	10 to 19	20 to 29	30 to 39	40 or more	
Frequency	8	8	7	–	–	23
%	34.8%	34.8%	30.4%	–	–	100%

The majority of respondents (69.6%) indicated that they send less than 10 but no more than 19 messages per week. However, looked at another way, the percentages of respondents indicated a nearly even three way split in each category. That is, 30.4% send between 20-29 messages, 34.8% send between 10-19, and 34.8% send less than 10 messages per week.

Question 48 asks the respondents to indicate the number of email messages sent to them and to which they reply. Table 48 (below), indicates the data.

Table 48

Number of messages sent to respondents per week to which respondents reply

	Less than 10	10 to 19	20 to 29	30 to 39	40 or more	
Frequency	8	13	2	–	–	23
%	34.8%	56.5%	8.7%	–	–	100%

Of responses occurring here, the highest number (13/23 of respondents) indicated that replied to 10-19 messages sent to them per week.

The number of times an individual sends an email message to a distribution list is indicated on Table 49 below.

Table 49

Number of messages sent to a listserv per week by respondents

	Less than 10	10 to 19	20 to 29	30 to 39	40 or more	
Frequency	22	1	–	–	–	23
%	95.7%	4.3%	–	–	–	100%

Twenty-two out of 23 respondents indicated that they send less than 10 messages per week to a distribution list. This is not a commonly used email function.

In order to delineate further the level of use of email in the Faculty of Education, respondents were asked to estimate the percentage (0-100%) of messages received per week according to 'type' of email. This included percentage of email messages which were work-related (Table 50), percentage of email messages which were junk-mail (Table 51) and percentage of email messages which were non-work related (Table 52). This

information has been organized into the frequency tables found below (Tables 50, 51 and 52) for a comparative analysis.

Table 50

Percentage of messages received per week that are work related

	0-20%	21-40%	41-60%	61-80%	81-100%	
Frequency	4	1	6	6	6	23
%	17.3%	4.3%	26.1%	26.1%	26.1%	100%

Table 50 indicates that the majority of email received per week by individuals is work-related. Eighteen of the 23 sampled individuals estimated that between 41% and 100% of their email was related to work.

Table 51

Percentage of messages received per week that are junk mail

	0-20%	21-40%	41-60%	61-80%	81-100%	
Frequency	13	6	2	2	--	23
%	56.5%	26.1%	8.7%	8.7%	--	100%

Table 51 indicates that the estimated amount of email received per week by individuals that is considered junk-mail is somewhat low. Nineteen of 23 individuals indicated that just 0% to 40% of their weekly email was junk-mail. Of these 19, the majority (13) felt that only 0% to 20% was junk-mail. Clearly, when one compares Table 50 (above) with Table 51, most of the email traffic occuring is considered work-related.

Table 52

Percentage of messages received per week that are non-work related

	0-20%	21-40%	41-60%	61-80%	81-100%	
Frequency	19	3	1	–	–	23
%	82.6%	13.0%	4.3%	–	–	100%

Table 52 indicates the estimated number of email messages received per week that the respondents considered to be non-work related. The majority of individuals (19/23) indicated that only 0% to 20% of their email traffic was non-work related. This again indicates that the majority of email traffic seems to be occuring within the work-related realm. These were estimated percentages by the respondents. It may prove more helpful if in future surveys, the respondents were asked to indicate types of email use using forced-structure percentage numbers.

The cause of these variations in 'kinds' of email is unknown. However, tentative speculation might conclude that some individuals are not on the Faculty of Education administration list which posts email messages to faculty members automatically. Another reason may be the individual interpretation of the terms used. For instance, 'junk-mail' may be interpreted differently by each individual completing the survey. One other reason may be that it is difficult to draw a line between what is work-related and what is not. These are estimates by respondents and must be considered as such. Follow-up interviews might provide further information on individual perceptions and attitudes.

In Table 53, respondents were asked to estimate the percentage of email messages they send and/or receive that are outside the University of Manitoba (Table 53) and inside the University of Manitoba (Table 54). A frequency table has been constructed to present this data below.

Table 53

Percentage of messages sent/received per week from outside University of Manitoba

	0-20%	21-40%	41-60%	61-80%	81-100%	
Frequency	6	6	5	5	1	23
%	26.1%	26.1%	21.8%	21.8%	4.3%	100%

Table 53 indicates the estimated percentage of email messages sent/received per week that are outside of the University of Manitoba campus. campus. Almost half of the respondents (11 of 23), indicated that over 40% of their sent/received email was from outside the University of Manitoba campus.

Table 54

Percentage of messages sent/received per week from inside the University of Manitoba

	0-20%	21-40%	41-60%	61-80%	81-100%	
Frequency	4	4	3	9	3	23
%	17.4%	17.4%	13.0%	39.1%	13.0%	100%

This frequency and percentage table (Table 54) indicates the estimated percentage of messages sent inside the University of Manitoba campus. The number of messages sent/received inside the University of Manitoba campus is estimated by 20/23 individuals as between 0% and 80%. This shows us that the estimated percentage of an individuals 'outside the campus' email traffic is nearly the same as the email traffic estimate for 'inside the campus'.

Question 60 asked respondents if they typically inform students of their email

address. Table 60 (below), reflects the response from individuals to this question.

Table 60

Respondents who inform students of their email address

	Yes	No	
Frequency	17	5	22
%	73.9%	21.7%	95.6%

Results indicated that 17/22 did typically give students their email address. One respondent did not answer this question.

Respondents were asked how long they had been using email. Table 61 below reflects the response to this question.

Table 61

Respondents' report of number of years using email

	1-2 Years	3-5 Years	6-9 Years	10 Years or More	
Frequency	6	12	3	1	22
%	26.1%	52.2%	13%	4.3%	100%

The majority of individuals (12/22) indicated that they had between 3-5 years experience using email. One respondent did not answer this question. Only one individual reported having ten or more years experience using email.

Summary of Research Question 1

Research question 1 asked, "How widespread is email use in the Faculty of

Education, University of Manitoba?"

Respondents agreed (21/23) that they used email on a day to day basis (Table 1), that they could read messages (22/23, Table 12) and send messages (23/23, Table 13). The high number of individuals who can perform these functions would be expected given the simplicity of the functions in question. Reasons may be that some functions are easier to perform or that they are found by respondents to be most useful.

The number of messages sent per week, received and replied to showed that respondents received more messages than they sent (Table 47), and that they replied to fewer messages (Table 46) than were sent to them (Table 48). Posting messages on a discussion group was not a common function (Table 49). As certain more complicated email functions require various separate operations to perform, the use of these functions decreases. Email is primarily being used daily to simply send and receive email.

The majority of email messages received by the respondents per week are work-related (Table 50). Junk-mail percentages ranged from 0-90% (Table 51), and non work-related messages received by respondents ranged from 0-60% (Table 52). Most faculty (17/22, Table 60) informed students of their email address. Eighteen of 22 respondents had between 1-5 years of experience using email technology (Table 61).

Missing responses were found for questions 60 and 61. It is unknown why these responses are missing. Reasons might include the fact that the respondents inadvertently missed the question, felt the question was irrelevant or intrusive, were concerned he or she could be identified, did not understand the question or felt the forced-response choices presented were not broad enough.

It should be noted that interpretation of the terms 'work-related', 'junk-mail' and 'non work-related' are open to personal interpretation (Tables 50, 51, and 52) and percentages are an estimate by respondents (Tables 50, 51, 52, 53, and 54).

Research Question 2

The second research question driving this study is, "How is email being used in the Faculty of Education, University of Manitoba?". This question attempts to explore

the various work and social uses of email technology by the Faculty of Education sample population. Tables 14-40 indicate the results of the survey questions. Respondents were asked to answer yes or no to questions about what operations they perform using email technology.

Table 14 indicates that 22/23 (95.7%) individuals can email the same message to several people.

Table 14

Respondents who can email the same message to several people

	Yes	No	
Frequency	22	1	23
%	95.7%	4.3%	100%

Table 15 (below) indicates the individuals who respond privately to messages originally sent to more than one person. The number of individuals who said they can perform this function totalled 21/23 or 91.3%. The high number of subjects who can perform this function may indicate that this is an important, basic function. Some functions may be easier to perform or they are found to be more useful than others.

Table 15

Respondents who can respond privately to messages sent to a group

	Yes	No	
Frequency	21	2	23
%	91.3%	8.7%	100%

Question 16 of the survey asked respondents if they could forward messages

received on email. Table 16 (below) indicates the response: 17/23 can and 6/23 cannot perform this function. This response may indicate a low difficulty level or a high perceived usefulness level for this function. This function may be perceived as an important one.

Table 16

Respondents who can forward email messages sent to them

	Yes	No	
Frequency	17	6	23
%	73.9%	26.1%	100%

The percentage of respondents able to sign on to discussion groups (Table 17, below) is above average. Thirteen individuals (13/23) are able to perform this function, or 56.5%. Slightly less than half (10/23) are not able to perform this function (43.5%).

Table 17

Respondents who can sign on to listserv groups

	Yes	No	
Frequency	13	10	23
%	56.5%	43.5%	100%

Table 18 (below) represents the individuals who can maintain files in which to organize email messages. The individuals who perform this function number 9/23 and those who do not is 14/23. Reasons for the low number of individuals who perform this

function may include the level of difficulty or perceived usefulness.

Table 18

Respondents who can maintain files in which to organize email messages

	Yes	No	
Frequency	9	14	23
%	39.1%	60.9%	100%

The pattern and number of individuals who can perform email technology tasks continues with Question 19 which asks if individuals are able to import or cut and paste data into an email message they are creating. Respondents indicated (Table 19, below), that 9/23 were able to perform this function.

Table 19

Respondents who can cut and paste or import data into an email message

	Yes	No	
Frequency	9	14	23
%	39.1%	60.9%	100%

The reason explaining why respondents are unable to perform this task is unknown. Only 39.1% are able to perform this function, while 60.9% are unable to do this.

Question 20 (Table 20, below) asks the respondents if they are able to attach a file to an email message. The number of individuals who cannot perform this function (12/23) is nearly the same number as those who can (11/23).

Table 20

Respondents who can attach files to email messages

	Yes	No	
Frequency	12	11	23
%	52.2%	47.8%	100%

It is unknown why this near even split might be so. It is possible that some functions are used more, are easier to perform or perhaps they are not easier to perform but are still seen as very useful.

Table 21 (below) indicates the response by the survey subjects concerning their ability to print email messages. Nearly all respondents (22/23) can perform this function. One individual cannot perform this function. It is unknown why so many individuals can perfom this function. One reason may be that printing email has been found to be very useful so many people have learned how to perform it. Another reason may be that it is seen as a very simple operation and so many have learned how to perfom it.

Table 21

Respondents who can print messages received on email

	Yes	No	
Frequency	22	1	23
%	95.7%	4.3%	100%

Respondents who can read attachments to email messages is well over half at 69.6%. (Table 22 below). In total 16/22 individuals can perform this task. One respondent did not answer this question, giving a total percent of 95.7% of responses

available for analysis.

Table 22

Respondents who can read attachments to email messages

	Yes	No	
Frequency	16	6	22
%	69.6%	26.1%	95.7%

Those who can print attachments to email messages is just slightly less than those who read the attachments. In total, since all respondents answered this question, 14/23 can print attachments (Table 23, below). Slightly more individuals can read attachments.

Table 23

Respondents who can print attachments to email messages

	Yes	No	
Frequency	14	9	23
%	60.9%	39.1%	100%

Those respondents who can and cannot create a distribution list (Table 24, below) is split nearly evenly: 11/23 can create a distribution list and 12/23 cannot.

Table 24

Respondents who can create a distribution list

	Yes	No	
Frequency	11	12	23
%	47.8%	52.2%	100%

Questions 25-40 ask respondents what kinds of activities they use email for; either social or work-oriented. Respondents were given a choice of five different responses to the question-leader, 'I use email to...'. A 'not-applicable' choice is offered.

Respondents who say they use email to send information to others is reflected in the table below (Table 25).

Table 25

Respondents who use email to send information to others

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	--	5	3	15	--	23
%	--	21.7%	13%	65.2%	--	100%

In this case 18/23 respondents use email to send information to others either often or very often.

Respondents who say they use email to seek information is indicated in the table below (Table 26). None of the respondents 'never' perform this function and 16/23 either often or very often use email to seek information.

Table 26

Respondents who use email to seek information from others

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	--	7	4	12	--	23
%	--	30.4%	17.4%	52.2%	--	100%

Those who use email to broadcast requests for information on list-serves (Table 27, below) were represented in each category except for the 'not applicable' box in which no responses were received. The majority of individuals never or only sometimes use this function (19/23). Four individuals (4/23) use this function often or very often.

Table 27

Respondents who use email to broadcast requests for information on listserves

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	14	5	2	2	--	23
%	60.9%	21.7%	8.7%	8.7%	--	100%

Respondents who indicated they use email to distribute information are detailed below in Table 28.

Table 28

Respondents who use email to distribute information

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	1	12	3	7	--	23
%	4.3%	52.2%	13%	30.4%	--	100%

Just under half (12/23) of the sample responding to the survey sometimes use email to distribute information. Ten of the 11 remaining either often or very often use email to distribute information.

Individuals who say they use email to give or receive feedback on ideas is represented in the table (Table 29) below.

Table 29

Respondents who use email to give or receive feedback on ideas

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	1	13	7	2	--	23
%	4.3%	56.5%	30.4%	8.7%	--	100%

In total 20/23 individuals sometimes or often use email to give or receive feedback on ideas. Two individuals indicated that they use it very often.

Table 30 represents respondents who say they use email to brainstorm for ideas. Of the 23 responses received, 8 individuals say they never perform this email technology function. One individual indicated that he or she performed the function very often.

Table 30

Respondents who use email to brainstorm ideas

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	8	9	5	1	--	23
%	34.8%	39.1%	21.7%	4.3%	--	100%

In Table 31 we see that the use of email to monitor projects as indicated by respondents is low; 11/23 never use email to monitor projects, while only 3/23

individuals do this often or very often.

Table 31

Respondents who use email to monitor projects

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	11	9	2	1	--	23
%	47.8%	39.1%	8.7%	4.3%	--	100%

Table 32

Respondents who use email to communicate with students

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	6	11	5	1	--	23
%	26.1%	47.8%	21.7%	4.3%	--	100%

In Table 32, 17 of 23 individuals indicate that they at least sometimes, often or very often use email to communicate with their students. Six of 23 individuals said that they never use email to communicate with their students.

The respondents who indicated that they use email to send or receive messages from their students is indicated in Table 33 (below). Eleven of 23 individuals said that they never send or receive messages from their students, while the same number of respondents (11/23) said that they sometimes or often use email this way. One individual indicated that this question was 'not-applicable". The reason for this response is unknown. Further exploration into why nearly half (47.8%) of the sampled population is not utilizing email to communicate with their students would be useful.

Table 33

Respondents who use email to send or receive assignments from students

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	11	9	2	–	1	23
%	47.8%	39.1%	87%	–	4.3%	100%

Respondents who use email to answer students questions is indicated in the table below (Table 34). Six of 23 individuals said that they never perform this email technology function. Sixteen respondents (16/23) indicated that they sometimes or often use email to answer students questions. There was one "not applicable" response and the reason for this is unknown.

Table 34

Respondents who use email to respond to students' questions

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	6	12	4	–	1	23
%	–	21.7%	13%	–	4.3%	100%

Continuing with uses of email for task purposes, Table 38 (below) indicates respondents who say they use email to schedule meetings or appointments. Here we see the pattern of use change from email communication functions with students to administrative use of email. All but one respondent indicated that she/he used email to schedule meetings at least sometimes, often or very often. One individual reported in with a "not-applicable" response. The reason for this unknown.

Table 38

Respondents who use email to schedule meetings

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	--	9	10	3	1	23
%	--	39.1%	43.5%	13%	4.3%	100%

Table 39 (below) indicates a number of respondents (6/23) who say they never use email to co-ordinate a project. Sixteen individuals of 23 indicated that they perform this email function sometimes or often (69.5%).

Table 39

Respondents who use email to coordinate a project

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	6	9	7	1	--	23
%	26.1%	39.1%	30.4%	4.3%	--	100%

In Table 42 (below), respondents were asked if they use email to resolve conflicts and the majority (15/23) indicated that they never do this. One "not applicable" response was received for reasons that are unknown.

Table 42

Respondents who use email to resolve conflicts

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	15	7	--	--	1	23
%	65.2%	30.4%	--	--	4.3%	100%

Fourteen of 23 individuals indicated in Table 43, below, that they never use email to poll opinions on a topic, while 3/23 individuals do this very often or very often.

Table 43

Respondents who use email to poll opinions

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	14	6	2	1	--	23
%	60.9%	26.1%	8.7%	4.3%	--	100%

The last question asked of respondents dealing with email use for tasks was if they send messages from a home computer (Table 44, below). Responses indicated that 9/23 individuals never perform this function. However, 14/23 respondents indicated that they do this sometimes, often or very often.

Table 44

Respondents who use email to send/receive messages from a home computer

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	9	8	3	3	--	23
%	39.1%	34.8%	13%	13%	--	100%

Questions regarding email use from a 'social' aspect are represented in questions 35-37 and 40-41. The following tables present this information.

Table 35 (below), indicates that all respondents say they use email to maintain relationships sometimes, often or very often. Twenty-two of 22 respondents indicated this and one individual did not respond to the question. The reason for the non-response

is unknown.

Table 35

Respondents who use email to maintain relationships

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	--	10	7	5	--	22
%	--	43.5%	30.4%	27.9%	--	95.6%

Table 36 (below), indicates that 19/23 respondents use email to learn about their interests often or sometimes, while 4/23 never use email technology for this function.

Table 36

Respondents who use email to learn about their interests

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	4	10	9	--	--	23
%	17.4%	43.5%	39.1%	--	--	100%

Table 37 indicates a high response from individuals (20/23) who say they never use email to participate in games. Only one respondent does this often.

Table 37

Respondents who use email to participate in games

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	20	2	1	--	--	23
%	87%	8.7%	4.3%	--	--	100%

Table 40 asks respondents if they ever use email to organize a social activity. Fifteen of 23 replied that they never or only sometimes do this. Only 7of 23 respondents indicated that they sometimes use email to organize a social activity. One "not applicable" response was received. The reason for non-response is unknown.

Table 40

Respondents who use email to organize social activity

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	15	7	–	–	1	23
%	65.2%	30.4%	–	–	4.3%	100%

Table 41 asks respondents if they ever use email to take a break from work and the responses indicate that 15/23 never do this. Eight individualsof 23 indicated that they sometimes use email technology to take a break from work.

Table 41

Respondents who use email to take a break from work

	Never	Sometimes	Often	Very Often	Not Applicable	
Frequency	15	8	–	–	–	23
%	65.2%	34.9%	–	–	–	100%

Summary of Research Question 2

Research question 2 asked, "How is email being used in the Faculty of Education, University of Manitoba?". Respondents indicated that a large majority were performing certain email technology operations such as sending the same message to several people (Table 14), responding privately to a group-sent message (Table 15) and printing an email

message (Table 21).

Respondents indicated a very near even split between those who do and those who do not perform certain email technology operations, such as signing on to a discussion group (Table 17), attaching files to an email message (Table 20), and creating a distribution list (Table 24).

The number of individuals who perform other administrative operations is lower, such as forwarding email (Table 16), maintaining files in which to organize email messages (Table 18) and cutting and pasting or importing data into an email message (Table 19).

Questions 35-37 and 40-41 asked respondents about their use of email for social tasks. Some social functions were never performed by a large majority of the respondents. These included email technology functions such as participating in games (Table 37), organizing a social activity (Table 40) and taking a break form work (Table 41.) Resolving conflicts (Table 42) and polling opinions (Table 43) were also functions which a majority of individuals indicated they did not perform.

Tables 32, 33, and 34 asked respondents about how they used email technology to communicate with their students. While Table 60, under Research Question 1, did indicate (17/22) that most of the sampled population did give their email address to students, Tables 32, 33, and 34 indicate that email technology is not being used to communicate with students. The reasons for this are unknown, but further investigation of the question may reveal more information.

Several patterns of email technology use emerged from this portion of the study. Research Question 2 asked faculty members how they were using email. Reasons for the particular responses of the sample can only be speculated upon. The following reasons might be considered: respondents have no need for certain operations, prefer to complete these tasks in other ways, or have not learned how to perform certain operations. Restrictions imposed by various computers or programs may impact tasks respondents are performing. Time constraints, interest level or personal perceptions of use of work time/social time could all affect respondents' answers.

Research Question 3

Research Question 3 concerns the attitudes of the sampled population to email technology; "What are the attitudes of the faculty members of the Faculty of Education, University of Manitoba toward email technology?" The questions asked of the sampled population in the survey are indicated in the Tables below.

Table 2 shows the respondents' level of agreement to the statement, 'using email has meant more work for me'. One respondent did not answer this question, however, 11/12 individuals either agreed or slightly agreed that this was the case. An equal number 11/22 took the opposing view, slightly disagreeing or completely disagreeing with the statement.

Table 2

Respondents who said that using email meant more work

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	7	4	4	7	22
%	30.9%	17.4%	17.4%	30.4%	95.2%

When asked in Question 3 if email was useful in their work 21/23 respondents agreed that it was. None disagreed with the statement totally, as seen in Table 3.

Table 3

Respondents who considered email useful in their work

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	21	1	1	–	23
%	91.3%	4.3%	4.3%	–	100%

Table 4 indicates that 20/23 individuals either agree or slightly agree that email is easy to use. Only three of 23 individuals slightly disagreed with this statement.

Table 4

Respondents who considered email easy to use

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	16	4	3	--	23
%	69.6%	17.4%	13%	--	100%

Question 5 asked respondents if they felt email made them more productive at work. If one compares this table (Table 5, below) with the results of Table 4 where 16/23 agreed that email was easy to use and Table 3 where 21/23 respondents agreed email was useful, we can see that while most agree email is useful, fewer agree it is easy to use and even fewer agree that it makes them more productive at work (Table 5).

Table 5

Respondents who considered themselves more productive at work using email

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	10	6	6	1	23
%	43.5%	26.1%	26.1%	4.3%	100%

Respondents were asked if they could do any communication function email does just as well another way. Table 6 (below), indicates the individual responses to this question.

Table 6

Respondents who said that anything email can do could be done just as well another way

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	2	5	7	9	23
%	8.7%	21.5%	30.4%	39.1%	100%

16/23 respondents either disagreed or slightly disagreed with this statement, indicating that more than half (69.5%) of the respondents thought email had unique properties.

Table 7 (below), indicates the response from individuals to the statement that email generally made them anxious. Twenty-one out of 23 either slightly disagreed or disagreed with the statement. Only 2 individuals slightly agreed with this statement..

Table 7

Respondents who considered using email made them anxious

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	--	2	3	18	23
%	--	8.7%	13%	78.3%	100%

Table 8 (below), gives the results of respondents to the statement that they become anxious when using email and something goes wrong.

Table 8

Respondents who said they became anxious when something went wrong while using email

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	4	5	4	10	23
%	17.4%	21.7%	17.4%	43.5%	100%

The responses are spread out but the majority (14/23) disagreed or slightly disagreed that they became anxious when using email and something goes wrong.

Respondents were next asked if they found email technology confusing and 17/23 either slightly disagreed or disagreed that it was. None agreed totally, but 6/23 did slightly agree that email technology was confusing

Table 9

Respondents who considered that email was confusing

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	--	6	2	15	23
%	--	26.1%	8.7%	65.2%	100%

Respondents were asked if they felt they communicated with more people since using email and the results are set forth in Table 10 below.

Table 10

Respondents who said they communicate with more people since using email

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	11	6	2	4	23
%	47.8%	26.1%	8.7%	17.4%	100%

Seventeen of 23 individuals either agreed or slightly agreed that they did communicate with more people since using email.

Question 11 asked if respondents thought email was overrated and those responses are indicated in Table 11 below.

Table 11

Respondents who considered email overrated

	Agree	Slightly Agree	Slightly Disagree	Disagree	
Frequency	3	10	7	2	22
%	13%	43.5%	30.4%	8.7%	95.6%

One individual did not answer this question and the reason is unknown. Of the 22 who did answer this question, 13 either agreed or slightly agreed that email was overrated.

Question 45 asked the sample population to rate themselves as email users. Responses (Table 45, below) varied from 1 expert to 1 "not applicable" response. The majority fell in the average category (11/23). In total 21/23 rated themselves as above average, average, or below average.

Table 45

Respondents rating of themselves as email users

	Expert	Above Average	Average	Below Average	Not Applicable	
Frequency	1	5	11	5	1	23
%	4.3%	21.7%	47.8%	21.7%	4.3%	100%

Individuals preference for on and off campus communication was queried with Question 55 and 56. The responses are indicated in the two tables below (Tables 55 and 56).

Table 55

Respondents' preference for on campus communication

	Email	Phone	Campus Mail	No Preference	
Frequency	4	8	--	9	21
%	17.4%	34.8%	--	39.1	91.3%

Table 56

Respondents' preference for off campus communication

	Email	Phone	Campus Mail	No Preference	
Frequency	8	6	--	9	23
%	34.8%	26.1%	--	39.1	100%

Respondent's preference for on-campus communication (Table 55) was not answered by 2 individuals. Of the 21 who did answer, 9/21 indicated they had no preference, followed closely by those who preferred the telephone (8/21) and finally 4/21 who preferred email.

Table 56 indicated the preference of individuals for communication off-campus.

All individuals of the sampled population answered this question. Many had no preference (9/23), email was next preferred (8/23) and the telephone the least preferred for off-campus communication. Most respondents had no preference for either on (9/21) or off (9/23) campus communication. For those who did have a preference, on-campus it was for the telephone first and for those off campus, the preference was for email first.

Respondents were asked if they considered the support system for email technology adequate in the Faculty of Education. Table 57 (below), reflects the individual responses.

Table 57

Respondents' who consider the support system at the U of M adequate

	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Don't Know	
Frequency	8	4	3	7	1	23
%	34.8%	17.4%	13%	30.4%	4.3%	100%

Twelve of 23 individuals either agree or slightly agree that the system is adequate while 10/23 individuals disagree or slightly disagree. One individual doesn't know if the support system is adequate and the reason for this response is unknown. Reasons for the mixed response to this question are unknown. It is possible that some individuals are able to access support systems more easily, are more likely to ask for help, are in close proximity to support staff or are on closer personal terms with individuals who can help than others. Knowledge of technical computer programs offering help may be utilized by some and not others.

Table 58 indicates the responses of the sampled population to Question 58 asking if they would attend a workshop for learning to use email more effectively. The majority

said no (13/23), however, nearly the same number said yes, they would (10/23).

Table 58

Respondents who say they would attend an email workshop

	Yes	No	
Frequency	10	13	23
%	43.5%	56.5%	100%

The reasons for the clearly mixed response to this question are unknown. Perceived efficiency and computer knowledge may contribute to the need of individuals for workshop study. Time constraints, scheduling difficulties, personal opinions about the value of workshops and finanicial reasons may all be influences.

Respondents were asked if improving their keyboard skills would increase their use of email. Table 59 (below) indicates the response by the individuals. The majority (20/23), said no, they would not use email technology more if they had better keyboard skills.

Table 59

Respondents who say better keyboard skills would increase email use

	Yes	No	
Frequency	3	20	23
%	13%	87%	100%

Summary of Research Question 3

The research question asked, "What are the attitudes of the Faculty of Education, University of Manitoba to email technology?"

Respondents indicated that half thought email was more work and the other half did not think it was more work (Table 2). Although nearly all agreed email was useful in their work (Table 3), fewer considered it easy to use (Table 4) and still fewer said it made them more productive at work (Table 5).

Email was seen as a unique communication technology by 16/23 respondents who disagreed that anything email could do could also be done just as well another way. (Table 6). Anxiety was indicated slightly by 2 respondents when using email (Table 7), but was felt by more respondents (Table 8) when something went wrong while using email. A majority disagreed that email was confusing (Table 9) and most respondents indicated that they communicated with more people since using email (Table 10). When asked if email was an overrated technology tool, 3 agreed it was, 2 disagreed and the rest fell in between (Table 11).

Respondents viewed themselves as largely average-skilled users of email (21/23), with one (1/23) expert and one "not applicable" response. No indication was given on the survey form as to why the question was "not applicable" (Table 45) and so the reason is unknown.

Preferences indicated by respondents for on and off-campus communication were for the telephone on-campus and email off-campus; an equal number of individuals had no preference for either on or off-campus communication (Tables 55/56). Those who agreed and disagreed that the support system at the University of Manitoba was adequate were nearly evenly split; 12/23 agreed or slightly agreed and 10/23 disagreed or slightly disagreed that the support system was adequate. Slightly more respondents said they would not attend an email workshop (Table 58) than those who said they would. A majority of respondents agreed improving keyboard skills would not increase their email usage (Table 60).

Research Question 4

The final research question concerns the demographics of the population sampled. Tables 62 - 67 reflects the data gathered to answer this question. The research question

asked, "What are the demographics of email technology use in the Faculty of Education, University of Manitoba?"

Question 63 was the single open-ended question on the survey form, directed to those individuals who indicated they did not use email. The question asked why the respondents did not use email. There were no responses to this question from any of the 23 individuals who completed the survey. It is not known why this occurred. It is possible that there are individuals who do not use email and did not respond to this question. There may be individuals who do not use email and did not to respond to the survey. Tracking of non-response would have been useful, particularly in this instance.

Table 62 asked respondents how they first learned to use email. Results indicated that the majority of individuals (15/21) learned to use email on their own. Two individuals did not answer this question. It is not known why.

Table 62

How respondents have reported learning email

	Mostly on Own	Mostly by Book	Colleague	Administrator	
Frequency	15	1	3	2	21
%	65.2%	4.3%	13%	8.7%	91.2%

Question 63 was an open-ended question asking that any respondent who did not use email to explain in the space provided why they did not. No individuals answered this question as indicated by the table below (Table 63). A firm conclusion cannot be drawn concerning this non-response; however, one reason may be that those who do not use email did not respond to the survey. A total of 41 surveys were sent out and 23 returned. One other reason may be that those who use email are more likely (for unknown reasons) to fill out survey forms. It may also be that those who do not use email are not interested in the subject in general or they do not want to identified in any

way. Further recommendations for tracking non-response are identified in Chapter Five.

Table 63

Respondents who say they do not use email

	Responses	
Frequency	0	0
%	0.0%	0.0%

Respondents were asked to indicate their home department in the Faculty of Education. One respondent did not answer this question. As Table 64 (below), indicates, 6 responses were from the Department of Curriculum: Mathematics and Natural Sciences. The total possible responses from that department were 12. The Department of Curriculum: Humanities and Social Sciences reported 8 individuals responding out of the total possible 13. The Department of Educational Administration responded with 4 individuals out of the 9 possible. Four individuals from the Department of Educational Psychology responded out of a possible 7 members eligible for sampling. These are not the total number of individuals in each department but rather the targeted population - the sample of 41 individuals, limited by having to be full-time faculty with 10 month term contracts and whose offices were normally in the Faculty of Education building. Senior scholars or those on sabbatical were not included.

Table 64

Respondents' home department

	C:MNS	C:HSS	Ed. Admin	Ed. Psych.	
Frequency	6	8	4	4	22
%	26.1%	34.8%	17.4%	17.4%	95.7%

Table 65 (below), indicates the respondents area of professional interest. Five choices were given in a forced-response structure. Four responses were missing from this question. The reasons for this are unknown; however it is likely that in 2 of the cases, respondents did not feel their area of professional interest was represented as they noted on the survey form itself that Mathematics, as a specific area of professional interest, was not present. It was intended to be included non-specifically in the Science and Technology category. The choices given on the survey form were: 1) Humanities, Social Sciences and Social Foundations, 2) Science and Technology, 3) Psychology and Applied Psychological Foundations, 4) Adult, Post-Secondary and Higher Education, and 5) Educational Administration.

Table 65

Respondents' area of professional interest

	Hum. SS&F	Sci.&Tech.	Psych/App. Psych	Adult & Post Sec.	Ed. Admin.	
Frequency	8	4	4	1	2	19
%	34.8%	17.4%	17.4%	4.3%	8.7%	82.6%

Respondents were asked to indicate their gender in Question 66. The results are reflected in the table below (Table 66). The total number of female responses possible from the sample were 15 and 6 out of this number responded. There were 26 male members of the faculty possible and 17 responded. All individuals answered this question. There was a higher male response than female. Reasons for this difference are unknown. The total sample of 41 individuals consisted of 15 females and 26 males. The percentage of females responding out of the total possible (6/15) is 40%. The percentage of males responding out of the total possible (17/26) is 65.4%.

Table 66

Respondents' gender

	Female (15)	Male (26)	
Frequency	6	17	23
%	26.1%	73.9%	100%

The final question asked respondents to indicate their total years teaching. Table 67 reflects the response to this question.

Table 67

Respondents' total years in teaching

	3-10 Years	11-20 Years	Over 20 Years	
Frequency	2	3	18	23
%	8.7%	13%	78.3%	100%

Summary of Research Question 4

The majority of the respondents learned to use email on their own (Table 62). Those individuals who did not use email, if any do not, were non-respondents since no one answered Question 63, "If you do not use email, why not?". Assumptions about the reason for this cannot be made since non-response was not tracked. (Table 63). The majority of responses came from the largest department in the Faculty but still represented less than half the responses possible in that department, while the two smallest departments reported a higher response rate per faculty member eligible for sampling (Table 64).

The respondent's area of professional interest (Table 65) was missing in four responses. It is unknown, except in two cases, why this occurred in such a large

percentage of the returned survey forms (17.4%). The two known reasons for non-response concern the lack of Mathematics as a specific area. Two respondents commented that Mathematics should not have been included in the area of "Science and Technology" and that it should have been quite separate. The largest area of professional interest indicated was Humanities, Social Sciences and Social Foundations (Table 65), also the largest department in the Faculty of Education. The majority of responses were received from males (17 out of a possible 26) while females responded (Table 66) to a lesser degree (6 out of a possible 15). The majority of individuals responding (18/23) had over 20 years teaching experience and none of the responding individuals indicated that they had fewer than 2 years of teaching experience (Table 67).

Chapter Summary

This chapter presented the results of the questionnaire sent to 41 members of The Faculty of Education, University of Manitoba who had full-time 10 month term contracts with the faculty. This sample did not include those who were on sabbatical, whose office was not normally in the Faculty of Education building or who were senior scholars. The responses totalled 23/41 individuals returning surveys to the researcher. Discussion of the results to the four research questions driving this study are presented at the end of each individual research question. However, the responses do indicate that the responding sample consisted mainly of a) individuals who had over 20 years of teaching experience (Table 67) and b) males (Table 66). Most individuals found email technology useful (Table 3) and viewed themselves as average-skilled users (Table 45). Tables 32, 33, and 34 indicate that respondents do not tend to use email to communicate with their students, but email technology is being use for administrative functions (Tables 14, 15, and 21).

No firm conclusions can be made. However further discussion of the data can be found in Chapter 5 of this study.

Chapter V

CONCLUSION

The purpose of this thesis was to investigate and document the uses of email technology by the full-time teaching faculty, Faculty of Education, University of Manitoba in the spring of 1997. The implications of the study will be discussed under the headings: Discussion of Findings, and Recommendations for Further research. Tentative conclusions will be stated.

Discussion of Findings

The study respondents were full-time teaching faculty members of the Faculty of Education, University of Manitoba, with at least a 10 month term contract. This did not include retired senior scholars, those on sabbatical or members whose typical office was outside of the faculty building.

The number of respondents who replied out of 41 was 23, which gives a return rate of 56.1%. While the respondents were predominately male, the total possible for the sample were 15 females and 26 males. The majority of respondents (78.3%, Table 67) had more than 20 years of teaching experience and had been using email for between 1 and 5 years (18/23, Table 61). Most of the individuals considered themselves 'average' users of email (Table 45). The majority of responses from departments represented were from the Department of Humanities and Social Sciences who reported in with a 34.8% response rate (8/13 members of the targeted population responded). This is also the largest department in the Faculty of Education. About half of the members of the two smaller departments responded: 8/16 from these two departments .

The data from this survey of email technology use by the 41 sampled members of the Faculty of Education, University of Manitoba allow for several tentative conclusions. First, most of the sampled individuals indicated that they used email on a day-to-day basis (21/23, Table 1) and found it to be useful (21/23, Table 3). Fifteen of 23 indicated

that they did not think email technology was confusing (Table 9) and that they communicated with more people since adopting email technology (17/23, Table 10).

Secondly, it appears that as email technology functions require more operations, they are used less. It is unknown if the functions are more difficult to perform or if they are thought to be less useful. Tables 12, 13, 14, 15, and 21 represent the response from individuals concerning use of email functions which require few manual operations to complete; 22/23 can read messages on email, 23/23 can respond to email messages, 22/23 can mail the same email message to several people, 21/23 can respond privately to a group message, and 22/23 can print messages. Tables 16, 17, and 18 represent email technology functions which are more complex and require more manual operations to excecute successfully. Seventeen of 23 individuals can forward email messages, 13/23 can sign on to listserv groups and 9/23 can maintain files in which to organize email messages. There is also some indication that a workshop might be useful for some individuals (10/23, Table 58) .

Thirdly, there are some email functions that are never or only sometimes used by the majority of the sampled population. Several of these are broadcasting requests for information (Table 27), using email to resolve conflicts (Table 42), pool opinions (Table 43), participate in games (Table 37), organize social activities (Table 40) or take a break from work (Table 41).

The telephone is still preferred for on campus communication (Table 55), while email is preferred for off campus communication (Table 56). As seen earlier in this chapter, individuals seem to be using email more for administrative tasks rather than communication tasks with their students. Tables 32 and 33 indicate that 11/23 only sometimes use email to communicate with students and 11/23 never use email to send or receive assignments from students. Table 34 shows us that 12/23 only sometimes use email to respond to students' questions. However, 17/22 (Table 60) inform students of their email address. In comparison, email is used routinely for administrative tasks. Twelve of 23 respondents attach files to email messages (Table 20), 11/23 create a distribution list (Table 24), 15/23 use email to send information to others (Table 25) and

13/23 often or very often use email to schedule meetings. A clear majority (21/23) considered email useful in their work (Table 3).

The majority of email received by faculty sampled is work-related (Table 50), followed by junk-mail (Table 51). Email use and anxiety levels are low (Table 7) unless something goes wrong with the technology and then they rise somewhat (Table 8). Social activities are limited; 10/23 individuals sometimes use email to learn about their interests, 7/23 sometimes use email to organize social activities 10/23 somtimes use email to maintain relationships. Respondents indicated that game-playing using email technololgy is uncommon (Table 37); 20/23 never use email to participate in games. Notable is Table 35, in which all respondents (22/22) indicated they use email to maintain relationships to some degree.

Limitations

Conclusions from the results of this survey are difficult to generalize to the University faculty population because of the small sample size and relatively low response rate. The results cannot be generalized to any other University of comparable size and location. One must consider the time of year that the survey was administered (the end of term) and the difficulty in investigating a constantly changing technology.

The study might have provided more information if the non-respondents had been tracked or interviewed. For instance, if the subjects who did not respond are email users or are not email users, more information could be gathered on why email technology is not being used or why email users did not participate in the the survey. An additional confounding variable of the time the data were collected was the beginning of a Faculty-wide change to an alternative email system. Consequently, conclusions about the results of this study must be made with caution.

Implications

The fact that technology is changing very rapidly has been highlighted during the writing of this paper. This research is a good indication of the difficulty in any research

hitting 'a moving target'. The University of Manitoba campus switched its email delivery system over to a new one in May, 1997 shortly after the survey instrument was mailed out to the Faculty of Education survey respondents. The new system is a Post-Office Protocol system which reportedly offers greater flexibility and access, but the plans for transferring to the new system were not well-conceived and, consequently, some Faculty were frustrated using email (Welsh, 1997, personal conversation).

Tentative implications for education might include:

1. A keyboarding class would not be well attended and is not needed by faculty.
2. Inservicing on use of email technology for educators may prove useful, since nearly half of the respondents indicated an interest in this.
3. Just over half the respondents view the computer support in the faculty as only adequate and the other half see the support as less than adequate. Better support for educational technology users is called for.
4. Since email is being used daily by the majority and found to be useful, administrators and educational institutions can capitalize on this practise in various ways to benefit both the users and those they are teaching. For instance, a positive attitude and proactive use of the technology by teachers and administrators sends the message to students that email is a useful medium of communication.
5. While the majority of respondents inform students of their email address, fewer actually communicate with their students through email. Further research is needed to investigate why this might be so, and what benefits, if any, might come from faculty-student email communication.
6. Individuals indicated that email technology is useful for some limited social activities, such as maintaining relationships. However, nearly all never use the technology to play games. This work ethic can be utilized by those developing curriculum and programming for educators, administrators and students.

Recommendations for Further Research

Any time a study produces a range of responses such as this study has done,

further exploration is needed. Further research might consider the following.

Academics' use of email communication technology might be compared with the manner in which it is used in other major organizations. For example, do large insurance companies use email differently than academics? Do other similar universities use email in different ways? Any further research should consider tracking all non-response in some manner since this would provide much needed explanation about use, attitudes and demographics. Follow-up interviews with respondents who use email and those who don't would be very useful.

Confirmation of the findings of this study may be found in a replication study in other similar settings where an email system has been in place for approximately the same number of years. Then longitudinal research, which tracks the use of email and other variables over time, could be implemented.

A follow-up email technology survey tracking the new email technology system currently being implemented in the Faculty of Education, University of Manitoba, would be useful to compare the responses of individuals between the two computer systems.

A controlled group of individuals providing email messages for analysis would be useful. A random sample of individuals messages could then be used for analysis. A content analysis of email messages that uses a code for determining the 'type' of email message may provide more indepth information for studying how and why email technology is being used and how users feel about this new form of communication.

Chapter Summary

In summary, this chapter presented the information found during the course of this research study. Conclusions must be made with caution . First the findings of the study were presented, and then the limitations to the study discussed. The implications for email technology are presented as well as recommendations for further research.

Conclusions

Full time teaching staff of the Faculty of Education, University of Manitoba are using email technology on a day to day basis to send, receive and print email messages. Other more complex applications are being used by most for mainly administrative tasks, but fewer use email for social activities, to resolve conflict or poll opinions. Nearly all of the respondents agreed that email was useful in their work, made them more productive and was easy to use. Anxiety was felt primarily when something went wrong. While more than half of the respondents gave their email address to their students, fewer used the technology to communicate with them. Support for system users was considered adequate by nearly half of the respondents. Nearly half would consider email inservicing but most respondents indicated that better keyboarding skills would not increase email use. The majority of those who replied to the survey learned to use email on their own, were male and had more than twenty years of teaching experience.

Electronic mail communication allows users to exchange information very differently than any previous form of communication. It is rapidly becoming a primary cultural and economic force. This new form of communication differs from traditional forms primarily in its speed and structure. The fact that people are using computers for communication leads to implications for those involved in higher education: a new form of literacy may emerge, preceding an increasingly technologically advanced work environment.

The rate at which technology changes challenges educators to seek solutions. Schools reflect their technology roots more than most other institutions. Electronic learning can happen where ever the device can be powered up - the classroom can go into the technology - new patterns of organization are possible. It is those using the technology who can best tell us how it can be used most effectively, rather than the technology dictating application. The computer screen is not like the page: it is more independent and more complex. Will the structure of texts begin to reflect the nature of computers? The page has limited dimensions while the computer and email text is multi-

layered.

There is promise in the use of email and other computer mediated forms of communication for education; they represent more efficient and timely methods of communication.

The progress toward transformation often starts with individual affirmation. Risks are taken and a culture conducive to change is born. Perhaps the real impact of using email in any organization is not simply an increase in communication efficiency, but a subtle, more pervasive change brought on by the nature of the technology itself.

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Appendix A Survey Instrument

This survey investigates the use of email technology by the full-time teaching faculty of the Faculty of Education, University of Manitoba. Completing it should take approximately 10-15 minutes. Please respond to the following questions. All answers will be strictly confidential.

DO YOU USE ELECTRONIC MAIL? YES Please continue with Question 1.

NO Please go directly to Question 63.

---

	1. Agree	2. Slightly Agree	3. Slightly Disagree	4. Disagree
1. I use email on a day-to-day basis.	1	2	3	4
2. Using email in my job has meant more work for me.	1	2	3	4
3. Email is useful to me in my work.	1	2	3	4
4. Email is easy to use.	1	2	3	4
5. Email makes me more productive at work.	1	2	3	4
6. Anything that email can do, I can do just as well some other way.	1	2	3	4
7. Using email generally makes me anxious.	1	2	3	4
8. I am anxious about email when something goes wrong and I don't know what to do.	1	2	3	4
9. Email technology is confusing to me.	1	2	3	4
10. I communicate with more people since using email.	1	2	3	4
11. Email is overrated.	1	2	3	4

I can...	Yes	No
12. Read mail messages on email.	1	2
13. Respond to mail messages on email.	1	2
14. Send the same mail message to more than one person on email.	1	2
15. Respond privately to messages originally sent to more than one person.	1	2
16. Forward messages received on email.	1	2
17. Sign on to listserves/discussion groups.	1	2
18. Maintain files to keep and organize email messages.	1	2
19. Import or cut and paste data into an email message I am creating.	1	2
20. Attach files to email messages.	1	2

21. Print messages received on email.	1	2
22. Read attachments to email messages.	1	2
23. Print attachments to email messages.	1	2
24. Create distribution lists or groups.	1	2

I use email to...

	Never	Sometimes	Often	Very Often	Not Applicable
25. Send information to people I know.	1	2	3	4	9
26. Seek information from people I know.	1	2	3	4	9
27. Broadcast requests for information in a listserve or bulletin board environment.	1	2	3	4	9
28. Distribute/provide information.	1	2	3	4	9
29. Give/receive feedback on reports/ideas.	1	2	3	4	9
30. Brainstorm/generate ideas.	1	2	3	4	9
31. Monitor progress of projects on which I work.	1	2	3	4	9
32. To communicate with my students.	1	2	3	4	9
33. Send/receive assignments from my students.	1	2	3	4	9
34. Respond to student questions.	1	2	3	4	9
35. Keep in touch/maintain relationships.	1	2	3	4	9
36. Learn about events/things that interest me.	1	2	3	4	9
37. Participate in entertaining events (games or conversations).	1	2	3	4	9
38. Schedule meetings/appointments.	1	2	3	4	9
39. Coordinate activities of a project.	1	2	3	4	9
40. Organize/coordinate a social activity.	1	2	3	4	9
41. Take a break from work.	1	2	3	4	9
42. Resolve conflicts/disagreements.	1	2	3	4	9
43. Poll opinions on a topic.	1	2	3	4	9
44. Send/receive messages from a home computer.	1	2	3	4	9

45. Rate yourself as an email user:
    1. expert
    2. above- average
    3. average
    4. below-average
    5. novice

46. The number of email messages I *receive per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

47. The number of email messages I *send* to individual people *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

48. The number of email messages *sent to me* which I reply to *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

49. The number of times I *send* an email message to a distribution list(s) *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

Of the messages I receive per week:

50. _____% are work-related.
51. _____% are junk-mail.
52. _____% are non-work related.

Total = 100%

Of the messages I send/receive per week:

53. _____% are outside the University of Manitoba.
54. _____% are inside the University of Manitoba.

Total = 100%

55. For on-campus communication, I prefer:
    1. email
    2. the telephone
    3. campus mail
    4. no preference

56. For off-campus communication, I prefer:
    1. email
    2. the telephone
    3. campus mail
    4. no preference

57. The support system for using email at the Faculty of Education, University of Manitoba is adequate.
    1. Agree
    2. Slightly agree
    3. Slightly disagree
    4. Disagree
    5. Don't know

58. If given the opportunity, I would attend a class/workshop to learn to use email more effectively.
    1. Yes
    2. No

59. Improving my keyboard skills would increase my usage of email.
    1. Yes
    2. No

60. I typically inform students of my email address.
    1. Yes
    2. No

61. I have used email for:
    1. less than one year
    2. 1-2 years
    3. 3-5 years
    4. 6-9 years
    5. 10 years or more

62. I first learned to use email:
    1. mostly on my own
    2. mostly from a book or manual
    3. from a colleague
    4. from formal instruction
    5. from a local area administrator (Geoff or Kevin)

Skip to Question 64.

63. If you *do not* use email, why not?

    _____

    _____

    _____

    _____

64. My home department is:
    1. Curriculum: Mathematics and Natural Sciences
    2. Curriculum: Humanities and Social Sciences
    3. Educational Administration and Foundations
    4. Educational Psychology

65. My professional area of interest is:
    1. Humanities, Social Sciences and Social Foundations
    2. Science and Technology
    3. Psychology and Applied Psychological Foundations
    4. Adult, Post-Secondary and Higher Education
    5. Educational Administration

66. I am:
    1. Female
    2. Male

67. Total years in teaching:
    1. 2 or less
    2. 3 - 10 years
    3. 11 - 20 years
    4. over 20 years

Thank you for taking the time to fill out this survey form. Please return the completed survey to the *Email Questionnaire Box* located in the general office mailroom.

Appendix B Survey Consent Letter

May 8, 1997

Dear Faculty Member,

I am conducting a research project to document the many uses of electronic mail technology by the full-time teaching faculty of the Faculty of Education, University of Manitoba. This survey is part of my Master's Thesis for the Department of Curriculum: Mathematics and Natural Sciences. Dr. James Welsh is my supervisor.

Teaching faculty in the Faculty of Education during the Spring of 1997 are being asked to fill out this questionnaire. The results of the study will provide a profile of email usage patterns by the full-time faculty.

A pretest found people averaged 10 - 15 minutes to fill out the survey. All responses are completely confidential and results will be presented in statistical summary only. All documents will be destroyed after being transferred to computer disc.

Your input is valuable. Please fill out the enclosed survey and return the completed form within two weeks.

I would be pleased to send you an abstract as soon as the study has been completed in July, 1997. Requests for an electronic abstract can be sent to: umsearcy@cc.umanitoba.ca. A printed copy of the survey abstract can also be made available should you prefer by leaving me a note in my mailbox located in the Faculty of Education general office mailroom.

The completed questionnaire may be returned to me by placing it in the *Email Questionnaire Box* located in the general office mailroom.

Thank you for your time.

Sincerely,

Darlene Searcy
Graduate Student

Appendix C Pre-Survey Letter

Darlene Searcy
Faculty of Education
General Office
University of Manitoba
umsearcy@cc.umanitoba.ca

Dear Faculty Member,

This note is to advise you that a survey requesting information about your use of electronic mail in the Faculty of Education, University of Manitoba will be mailed to you shortly. I hope that you will take the time to fill out this questionnaire and contribute to this study.

I am conducting a research project to document the many uses of electronic mail technology by the full-time teaching faculty in the Faculty of Education. This survey will form part of my Master's Thesis for the Department of Curriculum: Mathematics and Natural Sciences. My supervisor is Dr. James Welsh who may be reached at 474 9072.

You will be receiving this survey in approximately one week.

Sincerely,

Darlene Searcy
Graduate Student

Appendix D Follow-up Survey Letter

May 15, 1997

Darlene Searcy
Faculty of Education
General Office
University of Manitoba
umsearcy@cc.umanitoba.ca

Dear Teaching Faculty,

One week ago I sent you a survey concerning the use of email by the second term full-time teaching faculty in the Faculty of Education, University of Manitoba. If you have returned your completed survey, thank you very much for your time and consideration.

If you have not yet completed and returned your survey, please take time to fill this questionnaire out and return it to the *Email Questionnaire Box* located in the general office mailroom. Additional copies of the survey are located next to this box.

Thank you for giving this your consideration.

Sincerely,

Darlene Searcy
Graduate Student

Appendix E Final Prompt Letter

Darlene Searcy, Graduate Student
Faculty of Education
University of Manitoba

May 26, 1997

Dear Faculty Member,

Approximately two weeks ago you were sent a survey requesting information about your use of **email technology** in the Faculty of Education, University of Manitoba. Shortly after a follow-up letter was also sent. If you have already replied to this survey, it is very much appreciated.

If you have not yet been able to reply to this survey, I hope I can convince you that your input into the research discourse on email technology is important. As educators we are seeing an increase in technology use, and as yet the implications of this increase are unknown. Your completed survey is respectfully requested by Friday, June 6th, 1997. It may then be left in the *email questionnaire box* located in the general office mailroom. Extra copies of the survey are located next to this box should you require one.

This survey forms part of my Master's thesis for the Department of Curriculum: Mathematics and Natural Sciences. My advisor is Dr. James Welsh and he may be contacted at 474 9072.

Thank you for your time.

Sincerely,

Darlene Searcy

Appendix F Survey Matrix

Question 1: How widespread is email use in the Faculty of Education, University of Manitoba?

1. I use email on a day-to-day basis.

12. Read mail messages on email.
13. Respond to mail messages on email.

46. The number of email messages I *receive per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

47. The number of email messages I *send* to individual people *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

48. The number of email messages *sent to me* which I reply to *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

49. The number of times I *send* an email message to a distribution list(s) *per week*:
    1. less than 10
    2. 10 - 19
    3. 20 - 29
    4. 30 - 39
    5. 40 or more

Of the messages I *receive per week*:
50. _____% are work-related.
51. _____% are junk-mail.
52. _____% are non-work related.
Total = 100%

Of the messages I send/receive per week:
53. _____% are outside the University of Manitoba.
54. _____% are inside the University of Manitoba.
Total = 100%

60. I typically inform students of my email address.
    1. Yes
    2. No

61. I have used email for:
    1. less than one year
    2. 1-2 years
    3. 3-5 years
    4. 6-9 years
    5. 10 years or more

14. Send the same mail message to more than one person on email.
15. Respond privately to messages originally sent to more than one person.
16. Forward messages received on email.
17. Sign on to listserves/discussion groups.
18. Maintain files to keep and organize email messages.
19. Import or cut and paste data into an email message I am creating.
20. Attach files to email messages.
21. Print messages received on email.
22. Read attachments to email messages.
23. Print attachments to email messages.
24. Create distribution lists or groups.
25. Send information to people I know.
26. Seek information from people I know.
27. Broadcast requests for information in a listserve or bulletin board environment.
28. Distribute/provide information.
29. Give/receive feedback on reports/ideas.
30. Brainstorm/generate ideas.
31. Monitor progress of projects on which I work.
32. To communicat with my students.
33. Send/receive assignments from my students.
34. Respond to student questions.
35. Keep in touch/maintain relationships.
36. Learn about events/things that interest me.
37. Participate in entertaining events (games. or conversations.
38. Schedule meetings/appointments.
39. Coordinate activities of a project.
40. Organize/coordinate a social activity.

41. Take a break from work.
42. Resolve conflicts/disagreements.
43. Poll opinions on a topic.
44. Send messages from a home computer.

Question 3: What are the attitudes of the Faculty toward email technology?

2. Using email in my job has meant more work for me.

3. Email is useful to me in my work.

4. Email is easy to use.

5. Email makes me more productive at work.

6. Anything that email can do, I can do just as well some other way.

7. Using email generally makes me anxious.

8. Email technology is confusing to me.

9. I am anxious about email when something goes wrong and I don't know what to do.

10. I communicate with more people since using email.

11. Email is overrated.

45. Rate yourself as an email user.
    1. expert
    2. above-average
    3. average
    4. below- average
    5. novice

55. For on-campus communication, I prefer:
    1. email
    2. the telephone
    3. campus mail
    4. no preference

56. For off-campus communication, I prefer:
    1. email
    2. the telephone
    3. campus mail
    4. no preference

57. The support system for using email at the Faculty of Education, University of Manitoba is adequate.
    1. Agree
    2. Slightly Agree
    3. Disagree
    4. Slightly Disagree
    5. Don't know

58. If given the opportunity, I would attend a class/workshop to learn to use email more effectively.
    1. Yes
    2. No

59. Improving my keyboard skills would increase my usage of email.
    1. Yes
    2. No

Question 4: **What are the demographics of email use in the Faculty?**

62. I first learned to use email:
    1. mostly on my own
    2. mostly from a book or manual
    3. from a colleague
    4. from formal instruction
    5. from the local area administrator (Geoff or Kevin.

63. If you do not use email, why not?

    _____

    _____

    _____

64. My home department is:
    1. Curriculum: Mathematics and Natural Sciences
    2. Curriculum: Humanities and Social Sciences
    3. Educational Administration and Foundations
    4. Educational Psychology

65. My area of professional interest is:
    1. Humanities, Social Sciences and Social Foundations
    2. Science and Technology
    3. Psychology and Applied Psychological Foundations
    4. Adult, Post-Secondary and Higher Education
    5. Educational Administration

66. I am:
    1. Female
    2. Male

67. Total years in teaching:
    1. 2 or less
    2. 3 - 10
    3. 11 - 20
    4. over 20 years

Appendix G Kandies Survey Instrument

This section of the survey has statements about e-mail technology. After reading each statement, please indicate the extent to which you agree or disagree, by marking your responses in the answer column. Respond to questions 1 - 25 according to the following scale:

1) Agree 2) Slightly Agree 3) Slightly Disagree 4) Disagree

1. I don't have any use for e-mail on a day-to-day basis.
2. Using e-mail in my job has only meant more work for me.
3. I do not think that e-mail is useful to me in my profession.
4. I feel at ease using e-mail.
5. With the use of e-mail, I can perform tasks that enhance my performance on the job.
6. If I use e-mail, I will be more productive.
7. Anything that e-mail can be used for, I can do just as well some other way.
8. The thought of using e-mail makes me anxious.
9. E-mail technology is confusing to me.
10. I use e-mail to access many types of information for my work.
11. I do not feel threatened by the impact of e-mail.
12. I am anxious about e-mail because I don't know what to do if something goes wrong.
13. I communicate more often and/or with more people since using e-mail.
14. I feel comfortable about my ability to work with e-mail .
15. E-mail is an overrated tool for productivity.

I feel confident...

16. Reading mail messages on e-mail.
17. Responding to mail messages on e-mail.
18. Sending the same mail message to more than one person on e-mail.
19. Responding privately to messages originally sent to more than one person on e-mail such as in a listserve environment.
20. Forwarding messages received on e-mail.
21. Signing on to listserves/discussion groups.
22. Maintaining files (such as notebooks) to keep and organize e-mail messages.
23. Uploading documents created in a word processing program.
24. Printing messages received on e-mail.
25. Deciding which messages to keep and which to discard.

My Use of Electronic Mail

USING A TYPICAL WORK WEEK AS A POINT OF REFERENCE, PLEASE ESTIMATE

THE NUMBER OF TIMES PER WEEK THAT I ...

1) 0 2) 1-4 3) 5-10 4) 11-20 5) Over 20 times

26. Send an e-mail message to individual people.
27. Send an e-mail message to a distribution list(s).
28. Answer someone's previous e-mail message.
29. Forward someone an e-mail message.

I USE ELECTRONIC MAIL TO...	never				very often	not applicable
	1	2	3	4	5	9

30. Send information to people I know
31. Seek information from people I know
32. Broadcast requests for information in a listserve or bulletin board environment
33. Distribute/provide information
34. Give/receive feedback on reports/ideas
35. Brainstorm/generate ideas
36. Monitor progress of projects on which I work
37. Send/receive assignments from my students
38. Keep in touch/maintain relationships
39. Learn about events/things that interest me
40. Participate in entertaining events (games) or conversations
41. Schedule meetings/appointments
42. Coordinate activities of a project
43. Organize/coordinate a social activity
44. Take a break from work
45. Resolve conflicts/disagreements
46. Advertise/respond to rfp's
47. Poll opinions on a topic
48. Resend the same message to a person who may have missed it the first time
49. Send messages from a home computer

50. I am : 1) Female 2) Male

51. My age range is: 1) 30 or less 2) 31-40 3) 41-50 4) 51-60 5) over 60

52. My rank is: 1) Professor 2) Associate Professor 3) Assistant Professor
4) Instructor 5) other

53. I currently teach: 1) Yes 2) No

54. Years in teaching: 1) 2 or less 2) 2 - 10 years 3) 10 -20 years 4) over 20 years

55. I have used e-mail for: 1) less than 1 year 2) 1 - 2 years 3) 3 - 5 years
4) 5 - 9 years 5) 10 years or more

56. I first learned to use e-mail: 1) Self-taught 2) From a manual
3) From a colleague 4) Formal instruction 5) N/A

57. If given the opportunity, I would attend a class/workshop to learn to use e-mail more effectively: 1) Yes 2) No

58. I typically inform students of my e-mail address: 1) Yes 2) No

59. What type of e-mail program do you use predominately?
1) Mainframe Mail 2) PROFS 3) Unix Mail or Elm 4) DEC system
5) POPmail 6) ERIS 7) BEV 8) Eudora 9) Other 10) N/ A

60. I use the following platform for e-mail 1) Macintosh 2) PC DOS
3) PC Windows 4) UNIX Workstation 5) Mainframe Terminal 6) Other

Appendix H Kandies Letter of Permission

UNIX(r) System V Release 4.0 (merak) (pts/153)

login: umsearcy
Password:
Message 1/1 From Jerry Kandies Oct 23, 96 02:59:10 pm -0500
Re: Permission

(message addressed to Darlene Gail Searcy)

You may use portions of the instrument - if you'll share results with me when you finish. Good Luck!
Message 1/1 From Jerry Kandies Oct 23, 96 02:59:10 pm -0500
Re: Permission

(message addressed to Darlene Gail Searcy)

You may use portions of the instrument - if you'll share results with me when you finish. Good Luck!

Mailbox is '/var/mail/umsearcy' with 1 message [ELM 2.4 PL24 PGP2]

1 Oct 23 Jerry Kandies (42) Re: Permission

You can use any of the following commands by pressing the first character;
d)elete or u)ndelete mail, m)ail a message, r)eply or f)orward mail, q)uit
To read a message, press <return>. j = move down, k = move up, ? = help

Command:

Appendix I Permission to Use Campus Mail

Dean, R. Magsino
Faculty of Education
225 Education Bldg.

May 1, 1997

Dear Dr. Magsino,

This letter is a formal request for permission to use the campus mail system in the Faculty of Education Building.

I propose to conduct a survey of the University of Manitoba, Faculty of Education second term teaching faculty on their use of email. The study will be part of my Master of Education thesis in the Department of Curriculum: Mathematics and Natural Sciences. Dr. James Welsh is my supervisor. I would be grateful if you would allow me to use the mail system for delivery and receipt of the survey. My research proposal was accepted on April 14th, and unconditional permission given to me by the Ethics Committee on April 25th, 1997.

Please contact me should you require any further information . My email address is: **umsearcy@cc.umanitoba.ca.**

Sincerely,

Darlene Searcy, Graduate Student
71 Deer Lodge Place
Winnipeg, Manitoba
R3J 2B9
Student No. 5830071

Request approved by the Dean.

L.C. Hamilton

Appendix J Ethics Approval Form

Faculty of Education
ETHICS APPROVAL FORM

To be completed by the applicant:

Title of Study:

ELECTRONIC MAIL USAGE BY THE FULL TIME TEACHING FACULTY, FACULTY OF EDUCATION, UNIVERSITY OF MANITOBA

Name of Principal Investigator(s) (please print):

DARLENE GAIL SEARCY

Name of Thesis/Dissertation Advisor or Course Instructor (if Principal Investigator is a student) (please print):

DR. JAMES WELSH

I/We, the undersigned, agree to abide by the University of Manitoba's ethical standards and guidelines for research involving human subjects, and agree to carry out the study named above as described in the Ethics Review Application.

Signature(s) of Principal Investigator(s)

Signature of Thesis/Dissertation Advisor or Course Instructor (if required)

Appendix K Approval by Research and Ethics Committee

FILE COPY

THE UNIVERSITY OF MANITOBA

Faculty of Education
Research and Ethics Committee

Winnipeg, Manitoba
CANADA R3T 2N2
Telephone: (204) 474-9017
Fax: (204) 275-5962

Zana Lutfiyya, Ph.D., Chair

April 23, 1997

Darlene Searcy
71 Deer Lodge Place
Winnipeg, MB
R3J 2B9

Dear Ms. Searcy:

Your ethics application for the proposed research "E-Mail Usage by the Full-Time Teaching Faculty, Faculty of Education, University of Manitoba", was considered by the Research and Ethics Committee at its April 27, 1997 meeting. Your application was approved unconditionally.

On behalf of the Research and Ethics Committee, may I wish you well in bringing your research project to a successful conclusion.

Yours truly,

Zana Lutfiyya, Ph.D.
Chair, Research and Ethics Committee

ZL/vt

Appendix L Consolidated Survey Results

#	Question	Agree	Slightly Agree	Slightly Disagree	Disagree
1	Respondents who said they use email on a day to day basis	21	2	--	--
2	Respondents who said that using email meant more work	7	4	4	7
3	Respondents who considered email useful in their work	21	1	1	--
4	Respondents who considered email easy to use	16	4	3	--
5	Respondents who considered themselves more productive at work using email	10	6	6	1
6	Respondents who said that anything email can do could be done just as well another way	2	5	7	9
7	Respondents who considered using email made them anxious	--	2	3	18
8	Respondents who said they became anxious when something went wrong while using email	4	5	4	10
9	Respondents who considered that email was confusing	--	6	2	15
10	Respondents who said they communicate with more people since using email	11	6	2	4
11	Respondents who considered email overrated	3	10	7	2

#	Question	Yes	No
12	Respondents who can read messages on email	22	1
13	Respondents who can respond to email	23	--
14	Respondents who can email the same message to several people	22	1
15	Respondents who can respond privately to messages sent to a group	21	2
16	Respondents who can forward email messages sent to them	17	6
17	Respondents who can sign on to listserv groups	13	10
18	Respondents who can maintain files in which to organize email messages	9	14
19	Respondents who can cut and paste or import data into an email message	9	14
20	Respondents who can attach files to email messages	12	11
21	Respondents who can print messages received on email	22	1
22	Respondents who can read attachments to email messages	16	6
23	Respondents who can print attachments to email messages	14	9
24	Respondents who can create a distribution list	11	12

#	Question	Never	Sometimes	Often	Very Often	Not Applicable
25	Respondents who use email to send information to others	--	5	3	15	--
26	Respondents who use email to seek information from others	--	7	4	12	--
27	Respondents who use email to broadcast requests for information on listserves	14	5	2	2	--
28	Respondents who use email to distribute information	1	12	3	7	--
29	Respondents who use email to give or receive feedback on ideas	1	13	7	2	--
30	Respondents who use email to brainstorm ideas	8	9	5	1	--
31	Respondents who use email to monitor projects	11	9	2	1	--
32	Respondents who use email to communicate with students	6	11	5	1	--
33	Respondents who use email to send or receive assignments from students	11	9	2	--	1
34	Respondents who use email to respond to students' questions	6	12	4	--	1
35	Respondents who use email to maintain relationships	--	10	7	5	--
36	Respondents who use email to learn about their interests	4	10	9	--	--
37	Respondents who use email to participate in games	20	2	1	--	--

#	Question	Never	Sometimes	Often	Very Often	Not Applicable
38	Respondents who use email to schedule meetings	--	9	10	3	1
39	Respondents who use email to coordinate a project	6	9	7	1	--
40	Respondents who use email to organize social activity	15	7	--	--	1
41	Respondents who use email to take a break from work	15	8	--	--	--
42	Respondents who use email to resolve conflicts	15	7	--	--	1
43	Respondents who use email to poll opinions	14	6	2	1	--
44	Respondents who use email to send/receive messages from a home computer	9	8	3	3	--
45	Respondents rating themselves as email users	--	5	3	15	--
#	Question	Less than 10	10 to 19	20 to 29	30 to 39	40 or more
46	Number of messages received per week by respondents	--	2	12	5	4
47	Number of messages sent per week by respondents	8	8	7	--	--
48	Number of messages sent to them per week to which respondents reply	8	13	2	--	--
49	Number of messages sent to a listserv per week by respondents	22	1	--	--	--

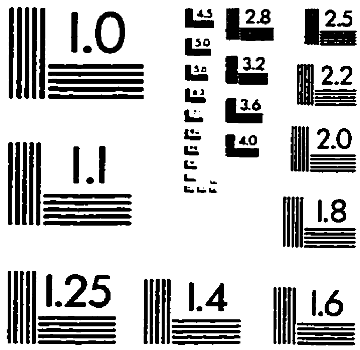
#	Question	Email	Phone	Campus Mail	No Preference	
55	Respondents' preference for on campus communication	4	8	--	9	
56	Respondents' preference for off campus communication	8	6	--	9	
#	Question	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Don't Know
57	Respondents' who consider the support system at the U of M adequate	8	4	3	7	1
#	Question	Yes	No			
58	Respondents who say they would attend an email workshop	10	13			
59	Respondents who say better keyboard skills would increase email use	3	20			
60	Respondents who inform students of their email address	17	5			
#	Question	1-2 Years	3-5 Years	6-9 Years	10 Years or More	
61	Respondents' report of number of years using email	6	12	3	1	
#	Question	Mostly on Own	Mostly by Book	Colleague	Administrator	
62	How respondents have reported learning email	15	1	3	2	
#	Question	Number of Respondents				
63	Respondents who say they do not use email	0				
#	Question	C:MNS	C:HSS	Ed. Admin	Ed. Psych.	
64	Respondents' home department	5	8	4	4	

#	Question	Hum. SS&F	Sci.&Tech.	Psych/App. Psych	Adult & Post Sec.	Ed. Admin.
65	Respondents' area of professional interest	8	4	4	1	2

#	Question	Female	Male
66	Respondents' gender	6	17

#	Question	2 Years or Less	3-10 Years	11-20 Years	Over 20 Years
67	Respondents' total years in teaching	0	2	3	18

IMAGE EVALUATION TEST TARGET (QA-3)



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