A STUDY OF THE INFLUENCE OF E-MAIL ATTITUDE AND SELF-EFFICACY ON THE WELL-BEING OF UNIVERSITY STAFF

A thesis in partial fulfilment of the requirements
for the degree
of
Master of Arts

in
Psychology
at
Massey University (Albany)

Evana M. Selak
2000

Acknowledgments

I would like to take the opportunity to acknowledge the key people that have provided the help, support, and inspiration that has enabled me to complete my thesis. Firstly, I would like to express my appreciation to Dr Hillary Bennett whose advice and guidance saw the foundation and form of this project established. Secondly, I would like to thank Dr Dave Clarke whose enthusiasm, guidance, and patience saw this project through to its completion.

I acknowledge my mum, Alison Norrie, for her continued emotional and financial support through out my education and in all I do and thank her for without this support I would not be realising my dreams. I would also like to acknowledge my dad and step mother, Ivan and Liz Selak, for their support in all that I have set my sights on doing and achieving. Also I would like to express my gratitude to my younger brother and sister, Mario and Dijana Selak, who have given me ongoing encouragement and throughout my education challenged me to still have fun.

I would like to thank my fantastic fiance Marc Lithgow, for his constant support, perspective, patience, and love throughout the last couple of years, and for the continuous encouragement he has provided when, at times, my own motivation was lacking. Thank you for inspiring me to reach my potential and believe in myself.

My years and achievements at university have been greatly influenced by my good friend Lynette Marchant. Lynette has been a pillar of support during these years, and I thank her for this. Without her companionship I would not have achieved as consistently highly as I have. I would also like to thank my generous friends: Naomi Davies who throughout this thesis year safely minded e-mails containing back up copies of my thesis in its various editions, and Catherine Patrick who read my final draft.

I would like to express my appreciation and gratitude to the senior management of Massey University (Albany), in particular Professor Ian Watson, for enabling me to conduct this research. Finally, I would like to thank the staff of Massey University (Albany & Palmerston North) who gave up their time to participate in this research.

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Abstract

The present study attempts to explore a cross section of university staff members' attitude towards the use of electronic mail (e-mail), their levels of self-efficacy (general, computer, and e-mail), and their sense of well-being; along with any possible relationships that may exist between these key constructs and various demographics. The factor structure of the e-mail attitude scale was also examined to see if it reflected tricomponent attitude theory. These areas have not been previously explored within New Zealand, and international research pertaining to these constructs is both fragmented and limited. A questionnaire was distributed to 2253 full-time Massey University staff members at the Albany and Palmerston North campuses according to the Human Resource Sections employment database as at the 1st March 2000. There were 569 respondents, yielding a response rate of 25.3% which was marginally below the desired 30%. The results indicated that this sample of Massey University staff members have a moderately positive attitude towards e-mail that reflects tricomponent attitudinal weightings, that staff engage in moderate levels of e-mail usage and that the most common purpose of e-mail use within the university was for administrative purposes. Overall the university staff demonstrated high levels of well-being and general self-efficacy, but only moderate levels of computer and e-mail based efficacy. The results of this study support Sherer, Maddux, Merchandante, Prentice-Dunn, Jacobs, and Rogers (1982) conceptualisation of general efficacy and provides some evidence of concurrent validity for the well-being scales. Further to this, differences between other types of efficacy and well-being scores generated from previous research emerged as did demographic differences. Hierarchical regression analysis based on the work of Baron and Kenny (1986) revealed that general efficacy was the only measure of efficacy to mediate the relationship between facets of e-mail attitude and well-being. General efficacy partially mediated the relationship between the affective e-mail attitude component and positive affect, and the behavioural e-mail attitude component and negative affect, as well as completely mediating the relationship between the behavioural e-mail attitude component and general life satisfaction. In concluding the limitations and recommendations for future research are also discussed.

Chapter One: Introduction

University staff as a loosely defined group have been the indirect focus in a variety of disciplines including Psychology, Business Studies, Science, and Information Systems. According to available literature university staff have been studied in terms of why faculty use e-mail (Minsky & Marin, 1999), job satisfaction (Watson & Slack, 1993), stress (Dewe & Guest, 1990; Nelson & White, 1990), negativity affectivity (Chen & Spector, 1991), media richness perceptions (Carlson & Zmud, 1999), e-mail flaming and copula deletion (Thompsen & Ahn, 1992), and media use (Komsky, 1991; Rice & Case, 1983).

Within the broad category of 'university staff', researchers have studied the following samples: secretaries, library staff, clerical workers, maintenance staff, health care personnel, academic advisers, accountants, office managers, administrators, and faculty (Watson & Slack, 1993). An analysis of the available literature suggests that academics or faculty have received a great deal more attention in research than university staff in more support or periphery roles (c.f. Faseyitan, Libii, & Hirschbuhl, 1996; Zhang & Espinzoa, 1997). Research investigating university staff representing a cross section of roles and positions, for example, administrators, and maintenance staff, and secretaries, and academics, and lecturers, as this study does is still unusual, although, slowly increasing in popularity (Watson & Slack, 1993).

Research pertaining to computer technology including electronic mail (e-mail) from a technical or situational perspective is bountiful (for example: Kiesler, Siegel, & McGuire, 1984; Porter, 1993a, b; Thompsen & Ahn, 1992), particularly within the university setting. Much of this research highlights how academics incorporate e-mail into their teaching and alternative uses for e-mail such as virtual tutorials (McGrady, 1999; Saunders & Weible, 1999). However, research that focuses on dispositional factors as opposed to the technical or situational factors relating to computer applications, such as e-mail, is negligible and nearly non-existent when limited exclusively to a university setting.

In recent years there has been exponential growth and interest in computer technology from researchers, practitioners, writers, the business sector, and laypeople alike. E-mail is now one of the most popular computer mediated communication

methods, and in an organisational setting e-mail has now mostly superseded the use of memos and letters (Porter, 1993a; Thompsen & Ahn, 1992). The importance and advantages of e-mail include: accelerated flow of information (Mantovani, 1994; Riva & Galimbert, 1997; Updegrove, 1991), regularised communication procedure, and general coordination (Komsky, 1991; Ku, 1996). It also provides groups who otherwise would not interact an avenue with which to communicate (Komsky, 1991; Mantovani, 1994; Riva & Galimbert, 1997; Sproull & Kiesler, 1991, cited in Corich, 1998).

Despite the popularity of e-mail usage, research interest has not yet extended to end users' attitude toward the medium, for example, e-mail attitude. Rather, to date only specific, technical questions centering around usage or behaviour patterns have been asked possibly representing a surface manifestation of the underlying attitude toward e-mail (Corich, 1998; Stirton, 1995). This unidimensional attitudinal perspective results in the loss of much of the potential insight and information. For example, when an attitude is defined from the tricomponent attitude perspective consisting of: affect, behaviour, and cognition (Ajzen, 1988), an attitude also has the potential to explain usage, related behaviours and the environment from an emotional and practical standpoint (Eiser & van der Plight, 1988).

Several emerging studies have highlighted how computer technology, in particular e-mail, has impacted, revolutionised, and changed both methods of communication and organisations (Bordia, 1997; Ku, 1996; Mantovani, 1994; Rice & Love, 1987). However, the effects of these changes on the individual in terms of well-being appear to date to have been overlooked, receiving minimal attention beyond discussing soft tissue or joint dysfunction related to over use syndrome (Reinoehl, Coates, Russell, & Engst, 1996). Even though the study of well-being in the workplace is well supported (Danna & Griffin, 1999) and established, with complete journals devoted exclusively to the topic (c.f. Work & Stress Journal).

Some rebuke this observation of the minimal attention to well-being relating to e-mail use, by arguing commonality between much of the research that has previously been conducted addressing the impact of computers on individual well-being (Brod, 1984; Dy, 1985), and prospective research relating to e-mail, as it is argued that e-mail is 'only' a computer application. This point of whether or not e-mail is 'only' a computer application is currently contentious with the likes of Minsky and Marin (1999) conceptualising e-mail as a reflection of one's personal image, rather than a

communication tool, making a clear differentiation between e-mail and other computer applications.

Self-efficacy is argued to play a major role in the nature and magnitude of an individual's responses to stimuli (Parkes, 1990 cited Langley, 1998) whether these responses be psychological or physiological. Although self-efficacy is a relatively young construct it has already firmly established itself as integral in a diverse range of responses such as: cardiovascular reactivity (Gerin, Litt, Deich, & Pickering, 1995), occupational stress and strain (Matsui & Onglatco, 1992), union participation (Bulger & Mellor, 1997), and initiative (Speier & Frese, 1997), highlighting that it has the potential to either moderate or mediate the relationship between e-mail attitude and well-being, which is a primary research focus for this thesis.

Self-efficacy or efficacy is another construct within Psychology which is fragmented and bound by theoretical division, namely the generality versus specificity debate. This study analyses efficacy from three levels: generalised, computer, and e-mail based efficacy in the expectation that it may provide 'another piece of the puzzle' to existing efficacy literature. Computer efficacy was only conceptualised in the last ten years (Compeau & Higgins, 1995a; Henry & Stone, 1997; Marakas, Yi, & Johnson, 1998) but holds much promise among researchers for providing insight into computer related behaviours (Marakas et al., 1998). The current literature suggests, that in an academic setting, individuals with higher self-efficacy are more productive in relation to research and more adaptable to new technologies (Compeau, Higgins, & Huff, 1999; Gist & Mitchell, 1992; Hill, Smith & Mann, 1987).

The aim of this study is to address this current void in the research. It is very topical and timely as it investigates a cross section of university staff in relation to the constructs of e-mail attitude, self-efficacy (generalised, computer, and e-mail) and well-being. The following chapters will address the theories and relevant research relating to each of these constructs in more detail. Given the limited and fragmented research that has been conducted with the sample and these constructs to date it is difficult to generate hypotheses based primarily on previously conducted research. Therefore, the present study is largely exploratory and investigative in nature, with research questions for the present study being addressed and discussed in the course of the following literature chapters.

Chapter Two: E-mail Attitude

E-mail

E-mail is an affectionate name for electronic mail, one of the most popular computer mediated methodologies, which allows users to exchange messages via a computer network (Mantovani, 1994; Porter, 1993a, b; Thompsen & Ahn, 1992). Although technology such as e-mail can have the same generic name it is important to highlight that it can serve vastly different functions depending on features, utilisation patterns, and implementation specifics (Rice & Case, 1983; Fulk & Boyd, 1991; Porter, 1993b). According to Minsky and Marin (1999), e-mail is further complicated compared to other technologies in that e-mail affects an individuals communication style. E-mail then becomes a formal and informal aspect of personal image, rather than, simply a communication tool, complete with its own etiquette of poor grammar and spelling.

E-mail, from its early inception, has been closely linked to academia as the purpose of ARPANET, the forerunner to e-mail, was to link industry, academia, and government by computer (Rice & Case, 1983; Hunter & Allen, 1992; Stirton, 1995). Specific implementations of e-mail can vary across software but the basic concept is a computer enhanced memorandum (Updegrove, 1991). Although, according to D'Souza (1992), e-mail has now evolved well beyond its original purpose of a computer enhanced messaging tool and is now frequently used for task management and documentation delivery.

In the context of this study, e-mail refers in general to the Internet based application that provides the potential for global memorandum communication, which can include attachments, graphics, and symbols, as opposed to only an exclusively 'internal' or 'in-house' messaging system (Ku, 1996). E-mail was more specifically defined in the present study as communication sent between individuals, groups, or organisations using computer technology (Sallis & Kassabova, 1997). Communications can be addressed to an individual or a group, be formal or informal, and can be read or reread at anytime that is convenient to the e-mail user.

E-mail presents significant organisational opportunities (Minsky & Marin, 1999) and there are many advantages of e-mail both in an intra-organisational and inter-

organisational context. E-mail accelerates the flow of information, regularises the communication procedure and coordination, as well as providing groups who would not usually interact, an avenue to do so (Corich, 1998; Hunter & Allen, 1992; Stirton, 1995). Research into e-mail based attitude in the psychological sense of the term is very limited. This observation could be expanded to highlight an overall lack of research into the effects of e-mail on individuals and their interpersonal relationships. To date the focus of research appears to be technology based, for example, software and system development or incorporating e-mail as a communication tool into existing communication theories (Bordia, 1997; Mantovani, 1994), despite Fulk and Boyd's (1991) suggestion that researcher's should investigate the effects of media choice on individual and organisational functioning.

Minsky and Marin (1999) believe Rational Choice Theories, for example, the Medium Richness Model (Trevino, Lengel, & Daft, 1987), which matches the needs of the individual to the medium's capabilities resulting in a continuum of information richness ranging from face to face communication to various types of written documents, has been replaced by Social Influence Theories, such as Social Information Processing Theory (Fulk, 1993; Webster & Trevino, 1995). Social Information Processing Theory removes assumptions of objectivity and cognition and instead focuses on individuals and their perceptions, choice, and the use of social media within a specific context, and how this might effect or impact on general usage (Fulk, 1993).

E-mail is placing new demands on people and organisations alike such as the 'hurry up' of work with its myriad of related issues (Harrison & Rainer, 1992; Hunter & Allen, 1992; Williams & Cooper, 1999). For example, some people experience difficulty and frustration in meeting new demands and the new style of the communication medium which can negatively impact on their well-being and cause overload creating a cycle that then further impacts attitude (Jex & Bliese, 1999). This scenario is further complicated by Carlson and Zmud's (1999) conclusion that when individuals are under strain they are less likely to choose the most appropriate channel for communication in a given situation.

In 1995 Stirton investigated the level of e-mail knowledge and use by Business Studies academic staff at Massey University (Palmerston North). This thesis broadly extends the work of Stirton (1995) by looking at the e-mail attitude of a cross section of

Massey University staff (Palmerston North and Albany), before more broadly exploring the relationships between e-mail attitude, efficacy, and well-being.

Attitude - An overview

Gordon Allport states in the 'Handbook of Social Psychology' that attitudes are Social Psychology's most indispensable concept as attitudes in essence give meaning to one's world (1935, cited in Franzoi, 1996). The term 'attitude' has increasingly been used and studied in recent years by various areas of Psychology and the public alike to provide explanations or insight into human behaviour and the world around us (Ajzen, 1988). However, increased use of this term has not meant a unified definition and direction, rather, the contrary with definitions of 'attitude' reflecting both diverse theoretical positions and interpretations.

Numerous attitudes have been assessed over the years and as new social issues emerge additional attitudinal domains, such as e-mail, are explored (Ajzen, 1988). To further complicate matters Franzoi (1996) highlights that in the literature there are many 'types' of attitudes ranging from symbolic attitudes, the internalisation of long standing values, to instrumental attitudes, which are based on direct benefits and costs associated with the attitude object.

Attitudes are classed as latent, hypothetical characteristics that can only be inferred and are highly context dependent (Ajzen, 1988; Eagly & Chaiken, 1993; Triandis, 1971). The trend within Social Psychology seems to be to define an attitude as simply a positive or negative evaluation of an object (Zanna & Rempel, 1988). This definitional viewpoint is basic and unidimensional, with the central focus exclusively on evaluation and ease of measurement, rather than, theory building (Ajzen, 1988; Eagly & Chaiken, 1993; Triandis, 1971). Allport (1971) highlighted that it is not easy to construct a definition broad enough to cover the many forms of attitudinal determination recognised but at the same time narrow enough to rule out aspects not agreed upon as part of an attitude. This dominant, unidimensional approach to attitude definition lacks much of the colour and depth of the tricomponent perspective. The tricomponent definition of attitude conceptualises an attitude as involving three distinct components affectionately known as the 'ABCs': Affect, Behaviour, and Cognitions which dates back at least to Plato in its origin (Ajzen, 1988; Triandis, 1971).

In broad terms, the affective component of attitude consists of the emotional feelings about the attitude object that is acquired through classical conditioning or when an object is paired with pleasant or unpleasant events (Triandis, 1971). The affective aspect is reflected in statements such as 'I like' or 'I hate' (Jennings, 1994), for example, 'I like using e-mail'. The affective attitude component is considered the strongest and most heavily weighted component which has the ability to influence the strength and direction of the other components especially when respondents are oppositely valanced or have dissonance between their cognitions and affect (Lavine, Thomsen, Zanna, & Borgida, 1998; Eagly & Chaiken, 1993; Eiser & van der Pligt, 1988) The behavioural component, which is also referred to as the conative component (Ajzen, 1988), reflects information gained through personal experience with the attitude object (Franzoi, 1996). For example, 'I have had difficulty sending e-mail messages'. This on the other hand is considered the weakest attitude component because it measures a predisposition to act and does not always reflect actual behaviour (Eagly & Chaiken, 1993). And finally the cognition component is the individual's logical analysis of their knowledge about the attitude object, which bridges the gap between feelings and behaviour (Triandis, 1971). For example, 'e-mail is an efficient method of communication'.

Focusing exclusively on one component from the tricomponent attitude approach can distort the situation as each component does not have to 'say' or indicate the same information (Henerson, Morris, & Fitz-Gibbon, 1987). For example, an affective attitude component could indicate that an individual likes using e-mail but the behavioural component could suggest that they have difficulty sending messages. However, this does not mean that each of the three components of an attitude are equally weighted proportions or neatly drawn categories (Franzoi, 1996). Rather, it is possible for there to be primary, secondary, and tertiary analyses, as the attitudinal components can be interrelated with various degrees of appropriateness depending on the context (Eiser & van der Pligt, 1988; Triandis, 1971). For example, in a given situation the affective attitude component might be weighted four times more heavily than the behavioural or cognitive component.

Deaux and Wrightsman's (1988, cited in Jennings, 1994) definition of attitude is grounded in the tricomponment perspective and shares commonalities to the views of Eiser and van der Pligt (1988). It provides a solid foundation and understanding for this

study by conceptualising an attitude as *"an index of an individual's thoughts and feelings about the people, the objects, and the issues in their environment. In addition, they (attitudes) provide clues to future behaviour, predicting how people could act when they encounter the object of their belief"* (p. 160).

An individual's attitude toward an object can be influenced or impacted by many factors, for example: demographics (Harrison & Rainer, 1992), subjective norms (Franzoi, 1996), available information, an individual's health or current level of functioning, personality (Ajzen, 1988; Harrison & Rainer, 1992), and whether he or she has an internal or external locus of control (Franzoi, 1996). Further to this, there are many factors that make it difficult to determine an individual's behaviour even if their attitude is known, as the relationship between attitude and behaviour is not considered direct (Eiser & van der Pligt, 1988). The relationship between attitude and behaviour can be influenced by time, attitude strength, intention, personality, situational variables, expected consequences, habits, social norms (Ajzen & Fishbein, 1971; Triandis, 1971), and length of specificity of attitude (Franzoi, 1996).

According to Eiser and van der Pligt (1988) our view of the world is selective. Attitudes are viewed as malleable because evaluations can change rapidly as events unfold and new information about a person, situation or issue becomes available (Ajzen, 1988; Triandis, 1971). However, correlations between attitude and behaviour are stronger when both the attitude and behaviour are measured at the same level of specificity, for example, grounded in a specific scenario (Eiser & van der Pligt, 1988).

This research is in contrast to most existing research which comes from a technical point of view focusing on situational, rather than, dispositional factors, or focusing more on technology 'attitudes', for example, computer opinions, rather than, specific behaviours and cognitions. Instead this study investigates the e-mail attitude of a cross section of university staff members, before investigating the relationship between attitude to e-mail and e-mail usage, as well as the impact of efficacy on the relationship between attitude to e-mail and well-being.

E-mail attitude

Recently computers and their various packages and applications have soared in terms of popularity (Hunter & Allen, 1992). The bulk of research related to computer technology appears to be grounded in the Information Systems and Management

literature. Yet Igbaria and Chakrabarti (1990) indicate that training contributes strongly to a decrease in computer related anxiety and has indirect effects on attitude as it influences affect and behaviours. Sadly, a parallel increase in interest has not yet been noted from the psychological research perspective.

Understanding how individuals develop perceptions and attitudes about a channel or form of communication, such as e-mail, is an important part of understanding the selection process and, therefore, use of the medium (Carlson & Zmud, 1999; Nelson & White, 1990). The extent to which an individual finds e-mail to be an efficient tool and thinks of e-mail as a source of personal benefit will be reflected in their attitude towards e-mail (Hunter & Allen, 1992). Therefore, one's attitude toward an object can be both an antecedent and outcome. In this research e-mail attitude is conceptualised purely as an antecedent.

Carlson and Zmud (1999) assert the importance of experience and how strain, inappropriate use and low e-mail attitude could potentially be turning people off e-mail as a method of communication, thus, it may never reach its potential within organisations. According to Fang (1998) it is the end-users who play one of the most significant roles in increasing organisational benefits and competitive advantage of a communication channel such as e-mail. Minsky and Marin (1999) agree with Fang (1998) by underscoring that attitude largely represents individual differences in usage, but add that attitude also helps to explain the major theories in the field namely, Rational Choice Theory (Trevino et al., 1987) and Social Influence Theory (Fulk, 1993). The e-mail attitude segment of this thesis develops the work of Minsky and Marin (1999) by expanding their focus to investigate e-mail attitude from the tricomponent perspective of affect, behaviour, and cognition, rather than, primarily the unidimensional, behavioural approach.

Minsky and Marin (1999) attempted to build upon Rational Choice and Social Influence research by investigating the role of individual differences in the choice and use of e-mail. Their research was also carried out within a university setting. However, unlike this study, their sample consisted only faculty members or academics from two selected Colleges - the College of Arts and Science and the College of Basic Science as opposed to a cross section of university staff. The e-mail attitude scale used in the present study was developed specifically for this study, although, loosely based on the

existing work of Minsky and Marin (1999). A significant component of this thesis centres around answering the question:

What are the factor structures of the e-mail attitude scale?

Minsky and Marin (1999) adapted the work of Ku (1996) for several of their scales. Their measure of e-mail use was adapted from Ku's (1996) scale of social and non-social uses of electronic messaging systems in organisations and their general e-mail use scale was adapted from Ku's (1996) measure of electronic messaging systems. To date no critiques or validation studies of Minsky and Marin's (1999) work have been conducted, which underscores the importance of this research to the field, as one of its purposes is to compare and contribute psychometric information on Minsky and Marin's (1999) E-mail Usage Scale and further investigate the relationship between e-mail attitude and e-mail usage.

This thesis, like Minsky and Marin (1999), primarily focuses on the individual perspective as it focuses on e-mail attitude in relation to well-being, and the role of various efficacies, namely generalised, computer, and e-mail within this relationship of 'users' as opposed to comparing users to non-users. This focus on the individual is not in vain according to Fang (1998) who highlights that it is well documented that the individual level is one level at which interventions can be targeted for overall improvement and change within an organisation. Which leads one to ask the following research questions:

Are there significant relationships or differences between, gender, age, location, position, typing speed, length of time using a computer, and length of time using e-mail and e-mail attitude?

Are there significant relationships or differences between university staff member's e-mail usage and the following demographics: gender, age, position, location, typing speed, length of time as a computer user, and length of time as an e-mail user?

E-mail and e-mail attitude within a university setting

The university setting has been a particularly rapid site for the implementation of technology such as e-mail due to universities' role as an information processor and generator (Rice & Case, 1983; Thompsen & Ahn, 1992). Most universities are spread over large areas, therefore, face to face communication is often replaced by mediated communication methods such as e-mail (Komsky, 1991). Added to this it is typical for faculty members to work irregular hours (Updegrove, 1992) due to their other roles such as consultants, researchers, or committee members.

E-mail within a university setting has three primary uses and purposes: instruction, research, and administration (D'Souza, 1992). Although, Komsky (1991) believes there is a fourth function which is purely social, to encourage e-mail usage to achieve the critical 'mass' needed to make the medium successful. For example, it is pointless to use e-mail for important administrative purposes if only a small percentage of staff use it regularly. Stirton (1995) reported that the most common use of e-mail within the Massey University setting was external communications primarily focusing on the joint authorship of papers with geographically dispersed people. However, in more recent years this appears to have changed with internal administration, coordination, and communication now being a more common reason for use. This observation led to the research question:

Is administration the most common reason for e-mail use?

As educational institutions, such as universities, strive to utilise technology to support and improve their instructional process and efficiencies the effects of computers, in particular e-mail, on staff and indirectly students will continue to grow (Ballance & Rogers, 1991). To date, research in relation to e-mail in academic settings seems to have contradictory findings (Corich, 1998). Mantovani (1994) believes these contradictory findings could be attributed to the fact that e-mail based research is highly specific and related to the technical and social environment. Further to this, he raises issue with the extensive use of students in research experiments that are aimed at clarifying organisational processes such as communication in compounding this confusion in e-mail research findings to date.

Empirical and theoretical considerations

The domain of attitude has not escaped debate or division with many issues and considerations arising out of investigation (Eagly & Chaiken, 1993; Henerson et al., 1987). First and foremost of which is that attitudes are self-reported (Harrison & Rainer, 1992), subjective experiences, in the sense that attitudes are unable to be checked, marked correct or incorrect, can vary despite similar conditions, and can be highly dependent on self preservation, social norms, and the requirements, and constraints inherent in their social roles (Eagly & Chaiken, 1993).

The current research is anonymous and confidential. It was anticipated that this would not only encourage more truthful responding but it was considered less likely that participants in the research would respond out of social desirability sets, although, this option can not be ruled out completely (Henerson et al., 1987). It is also debateable whether or not people are able to differentiate between what is causing or influencing their attitude (Eagly & Chaiken, 1993). However, in this research participants were only required to indicate their attitude towards a specific technology, namely, e-mail and do not have to give their reasons or justification for their decisions (Eiser & van der Pligt, 1988).

Research Questions

1. What are the factor structures of the e-mail attitude scale?
2. Are there significant relationships or differences between gender, age, position, location, typing speed, length of time using e-mail, and length of time using a computer e-mail attitude.
3. How does e-mail usage at Massey University compare with the findings of Minsky and Marin's (1999) American based university sample?
4. What is the relationship between e-mail attitude and e-mail usage for university staff?
5. Are there significant relationships or differences between university staff members e-mail usage and the following demographics: gender, age, position, typing speed, location, length of time using e-mail, and length of time using a computer?
6. Is administration the most common use for e-mail within a university setting?

Chapter Three: Well-being

Definition

Well-being has become a very popular topic in recent years with mainstream media, practitioners, and academic journals alike. Diener (1984) and Ryff (1989) believe that part of the interest in well-being in recent years is because most of Psychology's energy has been devoted to 'unhappiness' or dysfunctional behaviours, rather than, positive functioning or related behaviours. In broad brushstrokes the literature relating to well-being is disjointed, partially because it exists across diverse fields including: Psychology, Sociology, Engineering, Public Health, Management, and Law (Danna & Griffin, 1999).

Within available literature there appears to be a lack of specifically related theory that is guiding the concept development and direction of well-being (Ryff & Keyes, 1995; Watson & Clark, 1997). Rather, it appears that theory is borrowed and pieced together from various other constructs such as stress (Beehr, 1995). Watson and Tellegen (1999) acknowledge this and strongly assert that there is a real need for a systematic analysis of underlying issues and factors related to the understanding of well-being. Otherwise the field will remain at this current impasse.

Well-being is a complex construct. It can be defined as an outcome or an antecedent depending on the situation (Christopher, 1999; Haworth, 1997). In the context of this research well-being has been defined as an outcome variable. There are no clear cut formulas for determining or defining the nature of well-being, either in general or at an individual level (Christopher, 1999). Thus, lack of clarity in definition is compounded by the fact that well-being is an internal and subjective concept which is difficult to quantify. Despite this current lack of clarity and direction, authors such as Danna and Griffin (1999), believe well-being is an important construct worthy of continued attention, particularly within the work setting.

According to Warr (1987; 1994) the concept of well-being is broad and encompassing, with well-being able to be defined from many different theoretical frameworks, for example, physical symptomatology versus emotional states, and from many different perspectives, such as, the focal person, society, significant others, and mental health practitioners. Usually the exact meaning of the term well-being is implied

through context specific operational definitions in empirical investigations. There are a multitude of subjective and objective measures and indexes used in well-being research (Christopher, 1999), resulting in a proliferation of competing and at times confusing definitions. According to Christopher (1999), the most generally agreed upon definition of well-being was conceptualised by the World Health Organisation, which broadly outlines well-being as a state of complete physical, mental and social wellness and not merely the absence of disease or infirmary.

In the literature well-being is often confused with health. Health is only a component of well-being that comprises a combination of specific indicators, for example, blood pressure, weight, and heart condition (Danna & Griffin, 1999). Where confusion between health and well-being arises is that health, in terms of the presence or absence of illness indicators, is often the framework used to define physical well-being, (Warr, 1994). Further to this, the plight of construct confusion between well-being and health is not assisted by researchers and authors being inconsistent with the terms used in their literature.

In broad terms the measurement of well-being reflects the frustrations and fragmentations of definition and theory (Watson & Clark, 1997). Without definition and theory the measurement of well-being becomes subjectively based on researchers' beliefs, perspectives and experiences as opposed to based on an objective framework (Dewe & Guest, 1990). This complex situation surrounding well-being is only compounded by the apparent overlap that exists between negative affect, stress, and strain as observed and expressed by Burke, Brief, and George (1993), and Chen and Spector (1991). Further signalling and reinforcing the need for direction in the field and commitment from those involved in the field to stop 'patching' together small segments of measures with unknown psychometric properties or devising their own items. Rather, for researchers to further develop existing well-being related measures to bring stability and agreement of direction to the field (Warr, Cook, & Wall, 1979; Warr, 1990).

In well-being related literature Warr's Vitamin Model (1987) is one of the most theoretically sound and extensive influences. The Vitamin Model, focuses primarily on mental health or psychological well-being, which it divides into the following five components:

- affective well-being,

- competence,
- aspiration,
- autonomy, and
- integrated functioning.

Warr (1987) views mental health as a continuum ranging from healthy to severely ill and does not conceptualise well-being as occurring within a vacuum. Rather, he considers that these five facets of well-being act in conjunction with Principal Environmental Influences (PEI's). The PEI's highlighted in Warr's research were devised after considerable investigation into employment and unemployment stressors.

Warr's (1987) PEI's are:

- opportunity for control (which can be divided into intrinsic or external factors),
- environmental clarity,
- opportunity for skill use,
- externally generated goals,
- variety,
- opportunity for interpersonal contact,
- valued social position,
- availability of money, and
- physical security.

Out of the above PEI's 'opportunity for control' is considered the foundation of mental health as it contributes to well-being and influences control over other PEI's. For an individual to have control they need environmental clarity. Environmental clarity consists of feedback about the consequences of actions, certainty about the future, and clarity of role requirements.

Warr (1987) suggests that like vitamins, PEI's have a non-linear effect on well-being. Each PEI, according to Warr, is harmful either in low dosages or excess in a way that is analogous to the non-linear effects vitamins are supposed to have on our physical health (DeJonge & Schaufeli, 1998; Warr, 1987; 1990). The real advantage of Warr's

conceptualisation of well-being is that it can be used in work and leisure based scenarios as it is context free. Further to this, because Warr recognises individual difference can moderate the person versus environment relationship, there is an emphasis on the importance of studying the person-situation interactions (Haworth, 1997).

Within the Vitamin Model the importance of the 'externally generated goals' PEI to an individual's psychological well-being is highlighted. Externally generated goals could be seen as having an interesting link with e-mail and well-being, as e-mail has been closely linked to the 'hurry up of work'(Williams & Cooper, 1999). The 'hurry up of work' includes elements of constant goal and task reprioritization as high job demand, low job satisfaction, affective well-being, and life satisfaction have been associated with increased physical health illness symptoms, such as headaches, and nervous trouble (Haworth, 1997).

The opportunity of social interaction is also an interesting PEI in relation to e-mail, as with using e-mail there is personal contact, although not in its richest form, face-to-face communication, and rarely for emotional support purposes, rather the contrary, as e-mail is increasing linked to excessive and continuous demands (Williams & Cooper, 1999). The Vitamin Model and Warr's conceptualisation of well-being will be addressed as a thread and foundation throughout this chapter.

The Goldberg Health Questionnaire

Scales from the available well-being literature that have been used in this research and have supplemented and operationalised Warr's (1987) Vitamin Model of well-being are the Goldberg Health Questionnaire (GHQ), the General Life Satisfaction Scale, and the Positive Affect, Negative Affect Schedule (PANAS). These scales have varying degrees of supporting theoretical framework, although, each make valid contributions to well-being research. Further to this, they are frequently used in research with established and available statistics for comparison (Goldberg & Williams, 1988), and have excellent face validity. This observation of a lack of theoretical framework appears consistent with other research as often well-being scales are developed or 'patched together' for specific research purposes, rather than, being an extension of a theoretically sound framework (Warr et al., 1979). A key research slant of this study is to test this theoretical framework by asking:

What are the well-being levels of university staff? How does this compare to existing research?

Are there significant relationships between well-being scales used in this research?

The GHQ on its own does not provide a sound operationalisation of well-being, however, it suitably represents and has parallels with the autonomy and integrated functioning components of the Vitamin Model. Autonomy is defined as a person's ability to resist environmental influences and to determine their own opinions and actions. For example, not to act helpless in the face of life's difficulties (Warr, 1987). Integrated functioning, on the other hand, represents a healthy balance between love, work, and play. To lack integrated functioning would present a lack of coherence and a presence of physical strain, both of which are within the GHQ's sensitivity and range (Goldberg & Williams, 1988).

The GHQ was originally designed as a self-administered screening test for detecting minor psychiatric disorders among respondents in community settings, rather than, making clinical diagnoses. The items in the GHQ are the result of a factor analysis of Veroff and his associates work in the 1960s which naturally focused on well-being. There are five versions of the GHQ: GHQ-60, GHQ-36, GHQ-30, GHQ-28, and GHQ-12, the suffix number simply representing the number of items in the scale, for example, GHQ-60 contains 60 items. Each version of the scale simply containing different combinations of the same pool of items. The GHQ-60, GHQ-30, and GHQ-28 can be further broken down into four subscales: somatic symptom, anxiety and insomnia, social dysfunction, and severe depression (Goldberg & Williams, 1988).

For this research the GHQ-28 was selected, primarily because of its specific focus on physical illness and health. Further to this, it is the version of the GHQ most frequently used for research purposes (Goldberg & Williams, 1988). The GHQ-28 was derived from Goldberg and Hillier's (1979, cited in Goldberg & Williams, 1988) factor analysis of the GHQ-60. Since then 12 other validation studies of this version of the GHQ have been carried out.

The GHQ's theoretical framework has limited depth but makes the valuable observation that well-being has a psychological basis from which well-being can manifest itself physically, for example, the subscale titles of the GHQ-28. Therefore,

the GHQ focuses on physical manifestations of well-being such as strain, for example, loss of concentration or whether one feels 'run down' (Haworth, 1997). Appendix B includes items from the GHQ-28. What is interesting to note about the GHQ is that when it is used in research, in its various versions, the GHQ is reciprocally part of both the psychological and physiological dimensions of well-being because of how it conceptualises well-being.

The Positive Affect Negative Affect Schedule

The PANAS was selected to represent the affective well-being component of Warr's Vitamin Model (1987). Warr's own affective well-being scale was not selected as it largely taps the positive side of affect, despite research linking negative affect to well-being as opposed to positive affect (Watson, Clark, & Tellegen, 1988). Further to this, Warr's scale specifically directs questions towards work or leisure environments, rather than, being more context free such as his Vitamin Model.

The PANAS was developed as a brief and simple measure of positive and negative affect by Watson and his various associates. They drew its' items from factor analysing and reducing a pool of affective words derived from earlier studies by a variety of authors including Zevon and Tellegen (1982, cited in Watson & Clark, 1994). The PANAS highlights that well-being is influenced by an individuals 'happiness' or measures of positive affect in relation to measures of their negative affect (Ryff, 1989; Warr, 1999; Watson et al., 1988). The PANAS model's conceptualisation holds that well-being is heavily influenced by mood and emotional states (Watson, 1988; Watson et al., 1988) namely, positive and/or negative affect, which is similar to the GHQ's previously outlined perspective of physical symptomatology having psychological roots.

Since the development of the PANAS Watson and Clark (1994) have 'expanded' the items from the PANAS into subscales for the PANAS-X. The main reason for not using the PANAS-X in this study was due to its length. Validation studies and subsequent research has found the PANAS has not found any large or consistent gender differences. When university staff were tested using the 'past few weeks' time frame the alpha coefficients were reported as .86 for positive affect and .87 for negative affect, with an interscale correlation of -.09 which Watson (1988) highlights as being lower than many other brief measures of affect.

Well-being conceptualisation

Ryff (1989) highlights that well-being should be conceptualised as a combination of constructs addressing the dimensions of life satisfaction or happiness, positive affect, negative affect, and indicators of general health. This theoretical opinion is echoed by Daniels and Guppy (1994); Danna & Griffin (1999); Dy (1985); Haworth (1997); Mroczek & Kolarz (1998); Ryff & Keyes (1995); Warr (1987; 1990; 1994); Williams & Cooper (1999), although it has never really been expanded upon theoretically except for the Vitamin Model. It appears that more energy is focused on the measures within this framework, rather than, the theoretical framework itself so to speak.

From this broad yet established Vitamin Model perspective, well-being is viewed as a concept that should take into account the whole person and, therefore, not be context or response specific (Danna & Griffin, 1999; Warr, 1987; 1994). For example, an individual's experiences at work be they physical, emotional, mental, or social in nature obviously affect the person while she or he is in the workplace. These same experiences, also have the potential to spill-over into non-work domains (Danna & Griffin, 1999), such as home life, effecting one's life satisfaction and well-being, which is why the majority of well-being measures are not situationally specific.

The relationship between one's attitude to the work setting and well-being is complex, involving far more than only the consideration of potential physical hazards. A workplace or job can be damaging to an individual without there being any obvious immediate physical harm (Dy, 1985). Nelson and White (1990) highlight that technology such as e-mail should be viewed as part of the total psychosocial experience of work, which provides partial validation for the investigation of the relationship between an individuals attitude to e-mail and well-being.

Organisations and employers often only see the obvious signs of well-being from a unidimensional perspective such as the presence or absence of illness. This perspective fails to observe or acknowledge the more subtle aspects of well-being such as efficacy or affect (Williams & Cooper, 1999), which have been conceptually linked to well-being (Warr, 1987).

The hidden direct and indirect costs of poor well-being are significant for both the individual and the organisation and have recently become the topic of growing interest and concern (Williams & Cooper, 1999). Boyd (1997) cited the following

selection of costs and impacts of psychological and physical illness on the individual: insomnia, headaches, depression, low self-esteem, weight changes and panic attacks. Costs for the organisation as a result of workers with poor well-being according to Williams and Cooper (1999) include: poor service, difficult working relationships, poor internal communication and leadership, low morale, poor quality, lack of innovation, accidents, turnover, absence, low productivity, and poor decisionmaking.

When first introduced into the work setting regardless of their applications and software, computers were 'sold' to employees as being a tool to assist them in increasing their leisure time and health (Brod, 1984). The seductive advantages or features of computer applications such as e-mail highlighted in the previous e-mail attitude chapter included ease and speed of use. These advantages have created their own new potential well-being risks related to the 'hurry up' of work (Williams & Cooper, 1999). As e-mail now has the power to determine work flow - information flow is now 24 hours a day, 7 days a week, 52 weeks a year. Further to this, there is the complication of employees clearing e-mail as a 'break' activity thus increasing Occupational Overuse Syndrome (OOS) and related injuries not to mention their stress levels (Reinoehl et al., 1996).

Psychological well-being

Psychological well-being is the most central notion in Counselling Psychology and naturally a prominent part of Health Psychology (Ryff & Keyes, 1995). In 1979 Warr and associates indicated psychological well-being deserved greater measurement attention, more than 20 years later this statement still appears to be appropriate. Research into the area of psychological well-being peaked in the 1950s to 1970s. For more than 20 years since then the study of psychological well-being has been guided by and largely restricted to two concepts: 1) happiness and 2) life satisfaction (Ryff & Keyes, 1995).

Happiness according to Diener (1984) describes a person's overall experience in life. Life satisfaction can be similarly defined and naturally because of this there is debate surrounding the similarities and differences between these concepts. The generalised term of life satisfaction has been used as opposed to the more specific job satisfaction in this study. This is due to the global and general nature of well-being, and the fact that life satisfaction impacts and influences job satisfaction significantly more

than job satisfaction influences life satisfaction (Warr, 1999). However, Schmutte and Ryff (1997) pointedly highlight that research needs to move on and address more than only happiness and life satisfaction.

The concept of psychological well-being is largely a subjective, 'Western' notion that takes into account the affective balance of an individual (Christopher, 1999) with disregard for any spiritual component acknowledged by other cultures and times (Haworth, 1997). There are many different views about the components and processes of mental health, for example, psychological well-being. The concept psychological well-being is heavily value-laden making a single agreed definition and direction unlikely to be attained (Warr, 1994).

A dominant view within psychological well-being literature is the notion that psychological well-being, for example, mood, and happiness or life satisfaction, influences physiological indicators of well-being (Beehr, 1995; Warr, 1994) c.f., Vitamin Model, PANAS, and GHQ frameworks. Karasek's job demand-control model (1979, cited in Daniels & Guppy, 1994) provides additional support of this view by suggesting that when the psychological demands of a job are high and control over the job is low an individual's health status and overall well-being are lowered. In this research a suitable example could be the scenario of an e-mail inbox that 'beeps' to signal when the recipient has received new incoming mail. According to the job demand-control model a key to improving an individual's well-being in this scenario would be to allow the individual to modify their work environment in order to cope with the source of stress. For example, turn off or adjust the 'beeps' frequency and volume. This leads to the research question:

Are the relationships or differences between gender, age, length of time using e-mail, typing speed, length of time using a computer and the level of well-being for university staff significant?

Affect can simply be defined as emotional well-being or 'energy' that is directed towards an object (Weiss & Cropanzano, 1996; Wright & Doherty, 1998). Affect is considered a central component of personality (Schmutte & Ryff, 1997) and well-being. The consequences of affective experiences are both attitudinal and behavioural (Weiss & Cropanzano, 1996). Within the well-being literature affect is closely aligned with the

popular and widely recognised PANAS model. In 1994, Warr criticised researchers, such as Watson and his various associates, for exclusively directing their attention towards the concept of affect and basically ignoring the other contributing factors to well-being which he outlines as components of well-being in the Vitamin Model.

Positive affect and negative affect represent two broad and independent dimensions of emotional experience (Warr, 1999; Watson, 1988; Watson & Clark, 1997; Watson et al., 1988; Watson & Pennebaker, 1989), which form a very influential framework within the organisational sciences (Weiss & Cropanzano, 1996). In recent years positive emotion or affect has been classified as a hallmark for positive functioning and psychological well-being (Chen & Spector, 1991). However, unfortunately positive affect (PA) and negative affect (NA) as terms, like many other constructs, have been used inconsistently in the literature (Watson & Tellegen, 1999).

PA reflects one's level of pleasurable engagement with the environment and is composed of terms reflecting enthusiasm, mental alertness, and determination (Watson et al., 1988). In contrast, NA is a general factor of subjective distress and subsumes a broad range of aversive mood states including distress, nervousness, fear, anger, and guilt (Watson, 1988; Watson et al., 1988).

Overlap between psychological and physiological well-being occurs at the NA interface, as NA is consistently correlated with health complaints and physical symptoms. Whereas, PA on the other hand, is largely unrelated to health problems and complaints. Within well-being research NA is frequently called the 'nuisance factor' because those individuals with high NA are reported to inflate the frequency and intensity of physical and psychological distress in self-report measures (Danna & Griffin, 1999; Watson & Slack, 1993; Weiss & Cropanzano, 1996).

It is not uncommon in the literature for PA and NA to be investigated and treated independently of one another (Chen & Spector, 1991), as if an individual is high in NA does not automatically indicate they are low in PA. Or for PA and NA to be investigated specifically as 'states' as opposed to 'traits' (Watson et al., 1988) or vice versa. The classification of state or trait simply being dependent upon the time frame in which the individual is asked to respond to the scale in reference to, for example, in the last few hours versus in the last few weeks. However, the longer the time frame of reference the more robust the results are believed to be (Watson, 1988). Trait PA and NA have been established as corresponding to the personality factors of extroversion

and anxiety/neuroticism respectively (Watson et al., 1988), adding a further dimension to the field that needs to be explored.

As previously mentioned happiness is generally defined as the preponderance of positive affect over negative affect (Danna & Griffin, 1999; Ryff, 1989; Schmutte & Ryff, 1997). Happiness is also referred to as an 'ideal condition' that differs across cultures or as a measure of life satisfaction, as it is a global assessment of the quality of one's life as defined by themselves (Danna & Griffin, 1999). Within this study there is the ability to measure happiness, for example, the difference between PA and NA. This would not have be possible if Warr's affective well-being measure was used in this study. A relatively transparent single item indicator as developed by Campbell, Converse, and Rodgers (1976) was selected for life satisfaction which simply asked 'how satisfied or dissatisfied one was with their life as a whole?'.

The major individual differences relating to measures of psychological well-being according to available literature are broadly related to personality, sociodemographics, contextual, and situational factors (Mroczek & Kolarz, 1998). Therefore, a research question of primary concern in this study is:

Are there significant relationships between e-mail attitude and well-being?

Are there significant relationships between the well-being scales used in this research?

Physiological well-being

Simply stated physiological well-being refers to an individual's general physical health which some believe is significantly influenced by other indicators of well-being such as affect, and in particular negative affect, (Danna & Griffin, 1999; Watson, 1988; Watson et al., 1988; Watson & Slack, 1993). It is generally acknowledged that measuring physiological well-being is difficult as it can be affected momentarily by the likes of personal and environmental states, such as, diet, age, gender, weight, health habits, exercise, season procedural factors such as the scales used, and the time of the day (Beehr, 1995; Fried, Ronward & Ferris, 1984; Weiss & Cropanzano, 1996).

Watson and Pennebaker (1989) briefly outline three proposed theories to provide insight into the suggested relationship between affect and health complaints. Firstly, the

psychosomatic hypothesis which suggests high NA leads to health problems, ranging from headaches and acne to diabetes and coronary heart disease. Secondly, the disability hypothesis which suggests that health problems cause high NA through forced changes to personality due to chronic pain, physical disability, and social impairment. Finally the symptom perception hypothesis which believes individuals differ in how they perceive, respond to, and complain about their bodily sensations. Currently the symptom perception hypothesis is increasing in popularity as an explanation for the relationship between affect and health as, like the Vitamin Model, the symptom perception hypothesis acknowledges individual difference providing exciting research prospects for the future.

In the context of this research the chosen measures of well-being are classified as self-reported psychosomatic complaints, c.f., the GHQ. No clinical measures are being collected such as urine or blood samples (Danna & Griffin, 1999), as this was considered outside the purposes of this research and the field in which the research was based, as well as difficult to coordinate given the sample size at Massey University (Albany and Palmerston North).

The absence of physiological symptomatology does not itself necessarily signify a 'well' individual or vice-versa (Williams & Cooper, 1999) as is commonly thought. In this research the method of measuring physiological well-being is a subjective health complaint scale - the GHQ. One of the authors of the GHQ (cited in Watson & Pennebaker, 1989) acknowledges that the GHQ has been criticised for significantly overestimating the true association between variables primarily because its' theoretical platform closely links psychological and physiological well-being to measures of the participant's perceptions and interpretations of their internal physical sensations.

Despite this criticism of the GHQ and subjective health complaint scales in general, they are an exceptionally popular method of measurement. For example, subjective health complaint scales are very commonly used within the Work and Stress Journal, as it is acknowledged that subjective health complaint scales are theoretically insightful despite their apparent limitations (Danna & Griffin, 1999).

Moderators and mediators

As previously mentioned well-being in the psychological and physiological sense can be influenced and impacted by any number of antecedent factors (Boyd, 1997;

Danna & Griffin, 1999). Warr (1994) acknowledged that some job features are more predictive or influential on one type of well-being compared to others. Moderator and mediator research in relation to well-being has primarily been carried out in job specific, rather than, context free environments which is in complete contradiction to popular opinion within the field as previously discussed (Warr, 1987; 1990; 1994) and is somewhat confused between the definition of a mediating versus moderating relationship. Although the authors do not clearly distinguish between mediator and moderator effects, the mediators and moderators of well-being according to existing literature include: personality, socio-demographics, such as age, time of the day, locus of control, the work setting including safety hazards, the work/home interface which includes support networks, relationships at work, and role in the organisation (Beehr, 1995; Chen & Spector, 1991; Danna & Griffin, 1994; Daniels & Guppy, 1994; Warr, 1999; Watson et al., 1988).

Warr (1987) conceptualised variables that can impact well-being, regardless of specific situation, into the following framework and classification of Principal Environment Indicators (PEIs) which has since revolutionised this area of research by allowing each of the previously mentioned variables to be categorised into the following framework:

1. *Opportunity for personal control*: Employee discretion, decision latitude, autonomy, absence of close supervision, self-determination, participation in decision making, freedom of choice.
2. *Opportunity for skill use*: Skill utilisation, utilisation of valued abilities, required skills.
3. *External generated goals*: Job demands, task demands, quantitative or qualitative workload, attentional demand, demands relative to resources, role conflict, work-family conflict, normative requirements.
4. *Variety*: Variation in job content and location, non repetitive work, skill variety, task variety.
5. *Environmental clarity*: Information about the consequences of behaviour, task feedback, information about the future, absence of job future ambiguity, absence of job insecurity, information about required behaviour, low role ambiguity.
6. *Availability of money*: Income level, amount of pay, financial resources.

7. *Physical security*: Absence of danger, good working conditions, ergonomically adequate equipment, safe levels of temperature and noise.
8. *Opportunity for interpersonal contact*: Quantity of interaction, contact with others, social density, adequate privacy, quality of interaction, good relationships with others, social support, good communications.
9. *Valued social position*: Wider evaluations of a job's status in society, social rank, occupational prestige, more localised evaluations of in-company status or job importance, personal evaluations of task significance, valued role incumbency, contributions made to others, meaningfulness of job, self-respect from job.

A variable that is not specifically named within the above framework but that this study has isolated as worthy of focused attention is the construct of self-efficacy. Warr (1987) conceptualises self-efficacy as being one of the five components of well-being, as self-efficacy can be another label for competence. To date positive emotionality has been linked to high generalised self-efficacy and vice versa (Lightsey, 1996). Within this study self-efficacy will be investigated in three forms or levels of specificity namely generalised, computer and e-mail based. Self-efficacy will be discussed in more detail within the next chapter.

University staff and well-being

The research conducted on well-being among university staff is limited to only one available study, signalling a variety of future research opportunities. The only major research conducted in this area was done by Watson and Slack (1993) which investigated affective temperament and its relationship to job satisfaction over time at Southern Methodist University in the United States. This research echoes in conclusion many pre-existing and established findings related to well-being, for example, negative affect is significantly related to job stress, and satisfaction as well as somative complaints, depressive symptoms, and general life satisfaction. Of particular encouragement from this study was that the sample for a university sample was quite diverse, for example, the sample included sectaries, library staff, academic advisers, administrators and faculty.

Research Questions

7. Are there significant relationships between e-mail attitude and well-being?
8. What are the levels of well-being among university staff?
9. How do the levels of well-being compare to existing research?
10. Are there significant relationships between the well-being scales used in this research?
11. Are the differences or relationships between age, gender, position, location, typing speed, length of time using a computer, and length of time using e-mail for university staff significant?

Chapter Four: Self-efficacy

Definitions, theories and debate

Self-efficacy is a relatively new construct when compared to other constructs in Psychology, for example, attitude (Stanley & Murphy, 1996). Self-efficacy, often simply referred to as 'efficacy', has received a great deal of attention since its conceptualisation (Riggs, Warka, Babasa, Betancourt, & Hooker, 1994). Self-efficacy is of great interest to researchers in a variety of areas such as Health, Sport, Organisational, and Clinical Psychology. This may be due to evidence which suggests that self-efficacy can influence the kind of activity one engages in, the amount of effort expended, and the length of time one perseveres in the face of adversity (Compeau & Higgins, 1995b; Shelton, 1990). However, in recent years one could argue that some of the literature under the 'self-efficacy' banner confuses the latter with other psychological constructs such as self-esteem and locus of control (Bandura, 1997; Gist & Mitchell, 1992).

Marakas et al. (1998) believe that many definitions of self-efficacy understate it as "a dynamic construct that reflects more than an ability assessment" (p. 130). Efficacy reflects not only an individual's perception of their ability to perform a task based on past experience but also forms a critical influence on future intentions. This is why the construct is of such interest to Psychologists working in a spectrum of fields.

Self-efficacy was originally conceptualised and defined by Albert Bandura in the late 1970s as a rather specific type of expectancy concerned with one's beliefs in their own ability to perform a specific behaviour, or set of behaviours, to produce a specific outcome (Bandura, 1986; Gist & Mitchell, 1992). As will be discussed during the course of this chapter, this definition of self-efficacy has been challenged and broadened in recent years by other contributors to the field (Stanley & Murphy, 1996). Self-efficacy is now commonly defined as individuals' beliefs about their capacity to exercise control over events that affect their lives or beliefs about capabilities to mobilise the motivation, cognitive resources, and courses of action needed to exercise control over task demands (Maddux, 1995; Stanley & Murphy, 1996).

Self-efficacy is a key element of Social Learning Theory which was originally conceptualised as Social Cognitive Theory or SCT (Bandura, 1986; Gist, 1987).

Basically, SCT is a framework for understanding human cognition, action, motivation, and emotion (Bandura, 1997), that assumes individuals are capable of self-reflection and self-regulation, and therefore can be considered active 'shapers' of their environment. Individuals are to be in continuous reciprocal interaction with their cognitions, behaviour, and environment, rather than, simply passive reactors to them (Bandura, 1986; Compeau et al., 1999; Torkzadeh, Pflughoeft, & Hall, 1999).

Maddux (1995) observed that the crux, or essence of self-efficacy theory is the initiation and persistence of behaviours and courses of action that are determined primarily by judgements, and expectations concerning behavioural skills, capabilities, and the likelihood of being able to successfully cope with environmental demands, and challenges. Within self-efficacy theory Bandura (1986) theorised that an individual's self-efficacy judgement was the result of a unique combination of three factors:

- magnitude, which refers to the degree of difficulty a person believes he or she can attain,
- strength or a person's level of persistence despite obstacles, and
- generality, the degree to which the expectation of successful attainment is able to be generalised across situations.

In recent years debate has emerged surrounding the specificity versus generality of self-efficacy. To outline this debate in broad brushstrokes, at one end of the spectrum Bandura and his various associates assert self-efficacy is defined and measured in the context of relatively specific behaviours in specific situations or domains, rather than, as a personality trait or more stable attribute (Bandura, 1986, 1997; Gist, 1987; Wood & Bandura, 1989). However, within this paradigm it could be argued that the exact level of specificity at which self-efficacy is measured ideally is determined by the nature of the task and situation. If the assessment of self-efficacy is too highly specific to a particular situation it will not have applicability or relevance beyond that potentially isolated event (Maddux, 1995). For example, to measure an individual's perceived self-efficacy for using a particular function within a specific software application in a specific setting would have a very narrow scope and limited usefulness compared to how an individual perceives her/his overall ability to use the specific software application in general.

At the other end of the spectrum, the likes of Sherer et al. (1982), and Stanley and Murphy (1996) argue the value of generalised self-efficacy. Generalised or general self-efficacy can be defined as task specific efficacies which have generalised across other situations to create a stable overall sense of efficacy (Sherer et al., 1982; Watt & Martin, 1994). This perspective is reflected in more recent definitions of efficacy (Maddux 1995; Watt & Martin, 1994). Although, regardless of general self-efficacy's popularity Bandura (1997) argues it is a volatile construct as psychometric results can vary significantly depending on the range of activities and situational demands taken into consideration. This raises the following research question:

Are there significant demographic relationships or differences in the efficacy of university staff?

Opinions and stances on the specificity versus generality of self-efficacy exist passionately on a continuum, rather than, exclusively at each pole. In recent years within the spectrum of opinion there has been a definite shift towards the generalised conceptualisation of self-efficacy (Sherer et al., 1982; Stanley & Murphy, 1996; Watt & Martin, 1994) as opposed to domain or task specific self-efficacy, originally developed by Bandura.

In recognition of this shift, Bandura (1997) makes the argument that his original conceptualisation of self-efficacy is commonly misconstrued as only being concerned with specific behaviours in specific situations. Rather, he explains that self-efficacy exists on three basic levels which appear to mirror the dimensions of the current debate surrounding the field. The most specific level measures efficacy for a particular performance under a specific set of conditions, the intermediate level measures efficacy for a class of performances within the same activity domain under conditions sharing similar properties. Finally the most global measure of efficacy does not specify activities or conditions under which the behaviours must be performed. This signals a potential framework for integrating efficacy literature and research that could be acceptable to each end of the spectrum and which would allow the field to progress, rather than, stagnate.

Self-efficacy beliefs are constructed from four principal sources of information: enactive mastery experiences, that serve as indicators of capability, vicarious

experiences and modelling, which alter efficacy through transmission of competencies and comparison with the attainments of others, and physiological and affective states from which people judge their capability, strength, and vulnerability to dysfunction. Experiences of mastery, modelling, verbal persuasion, and arousal are more complex than their labels imply. Each of these experiences contribute in varying degrees to a variety of external and internal information cues that can impact on one's self-efficacy, either directly or indirectly (Bandura, 1986; 1997; Gist & Mitchell, 1992). Igbaria and Iivari (1995) reviewed the available Information Systems literature and concluded that mastery skills and verbal persuasion were frequently operationalised in the literature as prior experience and support, with experience being particularly influential to self-efficacy because of its direct and personal nature. It is due to the situation, person, and experiences of mastery, modelling, persuasion, and arousal that self-efficacy can vary across people for apparently the same task (Gist & Mitchell, 1992; Igbaria & Iivari, 1995).

According to Gist and Mitchell (1992) a key question to emerge surrounding the measurement of self-efficacy regardless of its level of specificity or generality is whether individuals can accurately assess or predict their own behaviour? To do this successfully an individual is required to perform the role of actor and observer simultaneously and objectively. As a partial response to their own question Gist and Mitchell concluded that judgements about efficacy become more routinised and automatic as experiences with a task increased.

As previously highlighted self-efficacy is an impressionable construct that is highly sensitive to both individual and environmental factors. Research has established that self-efficacy impacts on other constructs such as measures of well-being through its ability to influence physical and psychological indicators. This thesis seeks to confirm this observation by asking:

Are there significant relationships between university staff members' levels of efficacy and their well-being?

O'Leary (1985) highlights that self-efficacy impacts on an individual's attempts to exercise regularly, practise relaxation techniques, and reduce drug or alcohol use which also can affect an individual's physical well-being. Also, O'Leary (1992)

indicates that self-efficacy can affect well-being by the execution of behaviours that influence physiological stress responses which, when generated frequently, strongly, or over long periods of time, may exert effects upon a variety of health related outcomes.

The self-efficacy and well-being relationship is documented to be moderated by many variables including cultural values, performance orientation, goals, and feedback (Stumpf, Brief, & Hartman, 1987; Vrugt, 1996). Wood and Bandura's (1989) work provides additional support and insight into a relationship between efficacy and well-being by suggesting that one way for people to modify or influence their self-efficacy is to enhance their physical status, reduce their stress levels, or to alter their dysfunctional construals of somatic information, as it was concluded that peoples' beliefs about their efficacy influence how much stress and depression they experience.

Vrugt (1996) further supplemented this perspective by highlighting that psychological well-being is affected by the way in which people cope and their efficacy expectations. Low self-efficacy beliefs for highly desired goals or outcomes can lead to despondency or depression, which then impacts on coping attempts, thus, influencing physiological processes such as the immune system (Maddux, 1995). For example, often after major surgery or medical intervention self-efficacy theory is drawn upon indirectly to assist patients' physiological and psychological recovery. Physicians often use sources of efficacy to convince patients of their robustness by using vicarious learning with former patients who have recovered from similar surgery as role models (Bandura, 1986).

Until there is agreement on definitions regarding well-being and self-efficacy, research beyond broad brushstrokes will remain sparse, primarily due to the costs involved in having to investigate efficacy from so many perspectives and in so many situations. One of the aims of this research is to investigate the role of self-efficacy in the relationship between e-mail attitude and well-being, as often in research the moderating or mediating role of a variable such as self-efficacy is erroneously defined, if investigated at all (Baron & Kenny, 1986).

General self-efficacy

General self-efficacy is based on the premise that self-efficacy for various situations overlap to create a stable, overall sense of self-efficacy (Stanley & Murphy, 1996; Watt & Martin, 1994). Expressed another way, general self-efficacy can be

conceptualised as a composite of all important successes and failures that are attributed to one's self (Sheldon, 1990). Currently the notion of general self-efficacy is enjoying increased popularity and support, partially because the simplification of the construct from situational specificity provides research with more efficient and effective opportunities to investigate the field.

There is empirical evidence indicating a significant relationship between general and specific self-efficacy (Stanley & Murphy, 1996). However, sceptics of the notion of general self-efficacy highlight the strong relationship between general self-efficacy and locus of control or general self-efficacy and self-esteem (Stanley & Murphy, 1996; Tipton & Worthington, 1984) and question whether these constructs are not in fact similar.

The first to suggest and develop a scale to measure general self-efficacy was Sherer et al. (1982). They simply operationalised general self-efficacy as a construct that was based upon experiences from a variety of situations. Ironically Sherer and associates never intended for their scale or the notion of generalised self-efficacy to replace the more specific measures of efficacy. Rather, general self-efficacy was intended to be a heuristic. They saw general self-efficacy as related to domain specific self-efficacy as opposed to being conceptually different to it.

While general self-efficacy has increased in literary popularity, this popularity has not been parallelled with an increase in general self-efficacy measures. In this study Sherer et al.'s (1982) general self-efficacy subscale from their self-efficacy scale is used to measure general self-efficacy. Since its development the general self-efficacy subscale has been validated on a number of occasions (Bosscher & Smit, 1998; Sherer & Adams, 1983), and even provided a foundation for the development of other general self-efficacy scales, for example, Shelton (1990). Sherer et al.'s (1982) general self-efficacy scale was selected for this study because of its easy access, accepted use in research and literature (Shelton, 1990) and its statistical support which will be discussed in the methodology chapter. One of the aims of this research is to compare the findings of this study to existing research.

Bandura's (1997) main frustration with general self-efficacy came when it is spawned to create specific self-efficacy conclusions as measures of general self-efficacy with controversial predictive validity. This issue of predictive validity is difficult to resolve as the extent to which behaviours and situations require similar skills, the higher

the predicative validity (Maddux, 1995). Yet with general self-efficacy the experiences drawn upon can be quite diverse. Which leads one to question:

Are there significant relationships between general, computer, and e-mail efficacy for university staff?

Supporters of general self-efficacy such as Riggs et al. (1994) and Sherer and Adams (1983) believe the development of generalised self-efficacy scales provide an opportunity to greatly enhance Industrial/Organisational Psychology's research, as generalised self-efficacy measures allow for the comparability of results across job types and situations. Shelton (1990), who built on the work of Sherer et al. (1982), highlights that individual differences exist in measures of general self-efficacy expectations and that general self-efficacy affects an individual's mastery expectations in new situations.

Tipton and Worthington (1984) present another comparable middle ground in the specificity versus generality debate by hypothesising that an individual's performance is influenced both by specific and general self-efficacy. They found that in familiar situations, specific self-efficacy accounted for more variance and was a more accurate predictor, while in less familiar situations general self-efficacy accounted for more variance.

Computer self-efficacy

The major focus for human-computer interaction research in the 1980s to mid 1990s was the specification of design factors which lead to improved performance. In this performance driven culture, termed 'Cognitive Taylorism', scant regard was paid to the beliefs that people could hold about the computer systems they used, or about themselves as users of those systems (Briggs, Burford, & Draccup, 1998; Igbaria & Iivari, 1995).

In the mid 1990s this trend changed with the introduction of the Technology Acceptance Model (TAM) which investigated computers' perceived usefulness and ease of use (Compeau et al., 1999) and saw the birth of the domain specific construct - computer self-efficacy. Since the mid 1990s the role of self-efficacy in computing behaviour has received moderate attention (Compeau & Higgins, 1995b) and to varying degrees of depth. In 1998 Marakas and associates conducted an in-depth literature

review into computer self-efficacy. They concluded that the investigation of computer self-efficacy was still in its 'early stages', today this statement is still arguably correct.

Computer self-efficacy can be defined as "an individual's judgement of their capability to use a computer" (Compeau & Higgins, 1995a, p.192). Although, in their review Marakas et al. (1998) highlight that computer self-efficacy can also be defined generally, for example, computer knowledge, skills, and ability for all applications one has had experience with or specifically, in relation to knowledge, skills and abilities for a particular applications, such as e-mail.

To date research on computer self-efficacy has been simply broad brush strokes - basically scale development. Computer self-efficacy has been studied more as an independent or dependent variable than as a moderator or mediator (Marakas et al., 1998). Thus providing many potential research opportunities, for example, this study.

Generally speaking the relationship between efficacy and attitude is ill defined in the literature and confounded as the majority of energy within each field appears to be focused on overcoming difficulties within the field, rather than, exploring relationships between them. Zhang and Espinoza (1997) believe that there is a positive and predictive relationship between computer attitude and efficacy, which is echoed by Torkzahel et al. (1999) and will be tested in this thesis.

Differences in computer self-efficacy reflect differences in perceived skill level but also potentially in task, personality, and motivation. To date self-efficacy has demonstrated a strong link between computer technology adoption and the use of computers (Compeau & Higgins, 1995a; Compeau et al., 1999), underscoring its importance as an avenue of research. One of the aims of this study is to investigate the relationship between e-mail attitude and self-efficacy.

Henry and Stone (1997) signal that a lot of work still needs to be done developing and testing computer self-efficacy scales. A sentiment which is echoed by Marakas et al. (1998). Many existing measures lack attention to the dynamic, multilevel, and multifaceted nature of computer self-efficacy, as many computer self-efficacy scales do not measure both the magnitude and strength dimensions of self-efficacy as suggested by Bandura (1986). Further to this, Marakas et al. (1998) reported 19 out of 40 computer self-efficacy measures were modified from other self-efficacy scales and only 6 out of 19 of these scales had been validated. This criticism of

computer self-efficacy scales was a contributing factor in the selection of Compeau and Higgins (1995a) computer self-efficacy scale in this study.

Compeau and Higgins' (1995a) computer self-efficacy scale builds and expands on the existing measures of computer self-efficacy (Burkhardt & Brass, 1990; Hollenbeck & Brief, 1987; Webster & Martocchio, 1992, cited in Compeau & Higgins, 1995a). The main criticism of these existing measures is their brevity and lack of attention to the strength and magnitude factors of self-efficacy which were originally outlined by Bandura (1986). This scale was developed in close consultation to the SCT and with Information Systems literature. The validation study for this scale was also impressive, consisting of a pilot study and main study with a sample of 2000 knowledge workers ranging from accountants to researchers. The computer self-efficacy scale as a result of this has pleasing reliability, discriminate validity and internal consistency and has been used in other notable studies (Minsky & Marin, 1999).

Henry and Stone (1997) believe that improving our understanding of computer self-efficacy, from both antecedent and consequence perspectives, should have positive implications for applied activities such as computer training, education, implementation, technology development, and technology acceptance. Interestingly to date no available research or literature has investigated further domain specific self-efficacy in relation to computer, for example, computer application specific self-efficacy (Marakas et al., 1998). In this study e-mail self-efficacy is one of the constructs under investigation, making the comparison of specificity and generality of this study quite unique. The e-mail self-efficacy scale used in this research was a calculated word substitution using items from Compeau and Higgins (1995a) computer self-efficacy scale items, so that comparisons between computer and e-mail self-efficacies could be easily made.

As highlighted in the discussion on well-being, self-efficacy has been explored as a moderating or mediating variable on three levels (general, computer, and e-mail). O'Leary (1985; 1992) concluded that perceived self-efficacy impacted a variety of other health related behaviours indicating it will probably impact e-mail users well-being as well.

Self-efficacy measurement within a university setting

Once again research within a university setting based on either general or domain specific self-efficacy is minimal both in terms of quality and quantity.

Available research into the area of self-efficacy has yielded several consistent findings related to faculty research productivity, learning and achievement, and adaptability to new technology (Gist & Mitchell, 1992).

Computer self-efficacy has been measured within a tertiary setting using both student and staff samples (Marakas et al., 1998). Faseyitan et al. (1996) highlighted in their research that self-efficacy correlated highly with the use of complex technologies, and the adoption of computers in instruction. For example, faculty who do not use computers in instruction have lower self-efficacy than those who do. These findings could have interesting ramifications as Universities and their staff focus more on technology use, for example, Internet based learning, on-line services, and virtual tutorials.

Research Questions

12. Are there significant demographic differences or relationships in the efficacy for university staff?
13. Are there significant relationships between university staff members levels of efficacy and their well-being?
14. How do the efficacy findings of this study compare to existing research?
15. Are there significant relationships between general, computer, and e-mail efficacy for university staff?
16. What are the levels of efficacy among university staff?

Chapter Five: Methodology

The present study utilised the questionnaire method of survey research design. The questionnaire method has the advantages of being completed at the respondents' convenience and avoiding interviewer biases that are often expressed in relation to face-to-face or telephone based surveys (Goddard & Villanova, 1996). Further to this, a questionnaire is an appropriate method for collecting sensitive information, as participants can be more confident of the aninimity of their responses than if the information was recorded by an interviewer. Finally, questionnaires are considered an economical use of time, energy, and finances for conducting research with large samples compared to interview based survey options (Schweigert, 1994).

Sample

The university staff, both general and academic, involved in this present study were sampled from Massey University's Albany and Palmerston North campuses. The university staff from these campuses were selected as the sample population because it was thought that this group would provide a cross section of the different subgroups of academic and general staff members.

The sample population consisted of 2253 university staff. Every full-time and permanent university staff member on Massey University's Human Resource Section employment database from Albany and Palmerston North as at the 1st March 2000 was invited to participate in a parallel study investigating the impact of e-mail on staff and their relationships to work. The number of participants who responded to the study was 575, 6 responses were deemed unusable reducing the final number of usable respondents for this study to 569, yielding a 25.3% response rate. This is 4.7% below the typical response rate of 30% (Shaughnessy & Zechmeister, 1990).

General demographic characteristics of the sample

As shown in Table 1, there were more female (56.2%) than male (43.8%) participants in the sample. The average age of participants was between 30 to 49 years with approximately 50% of respondents fitting into this category. Of the remaining

participants approximately thirty percent were aged 50 plus, and fifteen percent were less than 30 years of age.

Table 1
Participant demographics

Variable	Frequency	% of total	Expected %	X^2	df
Gender (N=564)					
Male	247	43.8			
Female	317	56.2			
Age (N=561)					
less than 30	86	15.3			
30 to 49 years	306	54.3			
50 plus years	169	30.1			
Campus (N=560)				3.84	1
Albany	76	13.6	13.0		
Palmerston North	484	86.4	87.0		
College (N=511)				9.49	4
Humanities	86	16.8	12.6		
Business	81	15.9	22.0		
Sciences	178	34.8	32.5		
Education	64	12.5	12.6		
Other	102	20.0	20.3		
Number of years at Massey (N=562)					
less than 1	50	8.9			
1 to 5 years	200	35.6			
5 to 10 years	143	25.4			
10 plus years	169	30.1			
Position (N=546)					
Academic	272	49.8			
General	274	50.2			
% of Academic Staff teaching (N=276)					
Teaching	238	86.2			
Not teaching	38	13.8			
Mode of teaching (N=237)					
Internal	81	34.2			
Extramural	4	1.7			
Block mode	6	2.5			
Internal and extramural	84	35.4			
Extramural and block mode	5	2.1			
Internal and block mode	15	6.3			
Internal, extramural, and block mode	42	17.7			

Note: N≠569 due to missing data

In this study there were 76 Albany based participants (13.6%) and 484 Palmerston North based participants (86.4%): compared with the proportions of all staff on both campuses in the university, the proportions for the present sample were not significantly different, $X^2(1, N= 560)=3.84$, $p > .05$. Although the highest percentage (34.8%) of respondents were from the sciences college, the proportions by college were not significantly different from the college distribution, $X^2(4, N= 511)=9.49$, $p > .05$.

Most participants had worked for Massey University for between 1 and 5 years (35.6%). Further to this, there were about equal numbers of Academic staff (49.8%) and General staff (50.2%). Of the Academic staff 84 respondents were teaching a combination of internal and extramural papers (35.4%), closely followed by 81 participants who were only teaching internally (34.2%).

Table 2 displays the computer related demographic characteristics of the sample. The method of notification variable assesses how a participant's e-mail package notifies them of incoming mail. Generally speaking most participants e-mail packages notify them of new incoming mail by beeping (N=232).

Table 2
Participants Computer Related Demographics

Variable	Frequency	% of total
Method of notification (N=558)		
Beeps	232	41.6
Picture	97	17.4
Doesn't notify	182	32.6
Both beeps and picture	47	8.4
Typing speed (N=538)		
10 words a minute	28	5.2
20 words a minute	99	18.4
30 words a minute	155	28.8
40 words a minute	118	21.9
50 plus words a minute	138	25.7
Variable	**Mean**	**SD**
Years of computer use (N=557)	11.80	6.60
Years of e-mail use (N=557)	6.23	3.50
Number of e-mails sent (N=546)	9.90	9.40
Use of e-mail (N=519)		
Administration	51.4	31.8
Teaching	17.4	21.0
Social	13.4	17.8
Research	17.5	21.5

Note: N≠569 due to missing data

Table 2 also presents a breakdown of the participants typing speed in words per minute. Approximately twenty eight percent of participants (N=155) reported a typing speed of 30 words a minute, closely followed by twenty five percent of participants reporting a typing speed of 50 plus words a minute.

As shown in Table 2, the number of years the participants had been a computer user averaged 11.8 years, the number of years the participant had used e-mail packages

averaged 6.2 years, and the average number of e-mails a user sent per day was 9.9 e-mails.

Measures

The questionnaire consisted of seven sections, which were alphabeticalised from A to G (Appendix B). Section A was loosely based on Minsky and Marin's (1999) work assessing e-mail usage and attitude. Section B investigated the participants' perceived computer, e-mail, and general self-efficacy levels using Compeau and Higgins' (1995a) Computer Self-Efficacy Scale, Sherer et al.'s (1982) General Self-efficacy Scale and an E-mail Self-efficacy Scale which was specifically created for this research. Section C assessed participants' work relationships. Section D utilised Watson et al.'s (1988) PANAS, Campbell et al.'s (1976) General Life Satisfaction Scale, and Goldberg's (1988) GHQ-28 to assess individual well-being. Section E evaluated communication. Section F measured organisational commitment, and finally, section G gathered various demographic information. Only the scales and sections relevant to this thesis will be discussed in detail:

E-mail attitude

The e-mail attitude scale was developed for this research from Minsky and Marin's (1999) 'E-mail Usage Scale' and 'General E-mail Scale', which formed part of their 'Work Technology Survey', which was administered to faculty from a large state university in the United States. Minsky and Marin (1999) based their 'E-mail Usage Scale' on Ku's (1996) 'Scale of Social and Nonsocial Uses Of Electronic Messaging Systems In Organisations', and their (1999) 'General Usage Scale' from Ku's (1996) 'Measure of Electronic Messaging Systems'.

In developing the e-mail attitude scale for this research, it was important that questions represented each of the attitude components from the tricomponent attitude perspective, namely: affect, behaviour, and cognition (Ajzen, 1988), this will be confirmed when the factor structures of this scale are tested. Further to this, it was important to have positively and negatively phrased items to reduce the likelihood of mono-method bias (Goddard & Villanova, 1996).

In the selection of questions to be utilised in this study consideration was given to selecting questions that were applicable to the focus and sample of this study. All items in Minsky and Marin's (1999) 'E-mail Usage Scale' were utilised in this study. Participants simply responded how often they used e-mail for each function using a 5 point Likert scale, ranging from never to always. The 'E-mail Usage Scale' within this study achieved a Cronbach alpha of .89 (Minsky & Marin, 1999). No items in this scale were reverse scored, and the higher the score, the greater an individuals use of e-mail.

A satisfaction scale was also developed and attached to the measure of e-mail usage, although, this scale was not utilitised in this thesis. In the case of questions drawn from the 'General E-mail Use Scale' eight questions were considered inappropriate to the present study, after informally interviewing a cross section of ten general and academic staff from Massey University (Albany) (refer to Appendix A). Further to this, one of the items from Minsky and Marin's (1999) 'General E-mail Use Scale' was split into two separate questions as the original question was considered to be 'double barrelled'. The remaining questions from this scale were rephrased so that they could be scored on a five point Likert scale, ranging from strongly disagree to strongly agree, so as to be consistent with the 'E-mail Usage Scale', rather than, having respondents answer 'yes' or 'no'. The instructions for this scale were also modified. Several items from this revised scale were reverse scored, higher scores indicating a more positive attitude towards e-mail.

Self-efficacy

- *Computer Self-efficacy Scale*

Computer self-efficacy was assessed using the Computer Self-efficacy Scale developed by Compeau and Higgins (1995a). This scale consists of 10 items and measures the magnitude and confidence/strength dimensions of self-efficacy as operationalised by Bandura (1986). Respondents answer 'yes' or 'no' to whether or not they could complete a job using a nameless new software package. If the participant responded 'yes' they then rated the extent to which they would be able to confidently perform a computer related task on a 10 point scale, ranging from 'not at all confident' to 'totally confident'. No items in this scale were reverse scored. The number of 'yes' responses recorded refers to the magnitude of the computer self-efficacy or ability to

accomplish difficult tasks. While adding up the ratings between 1 and 10 indicates participants' confidence or level of conviction about their magnitude judgement.

Compeau and Higgins' (1995a) validation study of this scale on a 2,000 strong sample of 'knowledge workers' who subscribe to a particular business periodical demonstrated that their Computer Self-efficacy Scale had an internal reliability of .95 and a discriminant validity of .81. In 1999 Compeau et al. demonstrated the test retest reliability of the Computer Self-efficacy Scale, by reporting an internal consistency reliability of .94 and discriminant validity of .79 once again using a particular business periodical sample.

The Computer Self-efficacy Scale was also utilised in Minsky and Marin's (1999) investigation into why faculty use e-mail. In Minsky and Marin's (1999) study computer self-efficacy had a mean of 68.65 and standard deviation 21.38, and was found to be related to e-mail use (r =.35, p <.01), although no other statistics were cited due to the focus of their study.

- *E-mail Self-efficacy Scale*

The E-mail Self-efficacy Scale was developed for the purposes of this study to compare perceived levels of computer and e-mail self-efficacy. This scale was developed from the Computer Self-efficacy Scale utilised in this study. In place of the phrase 'software package', 'e-mail application' was substituted.

This scale also consisted of 10 questions. Once again no items were reverse scored with the number of 'yes' responses recorded referring to the magnitude of e-mail self-efficacy or ability to accomplish difficult tasks. Adding up the ratings between 1 and 10 indicates participants' confidence or level of conviction about their magnitude judgement.

- *General Self-efficacy Scale*

Sherer et al. (1982) General Self-efficacy subscale from their Self-efficacy Scale was used to measure general self-efficacy in this study. There are a total of 17 items in the General Self-efficacy Scale, on which participants indicate on a 7 point Likert scale, ranging from 'very strongly disagree' to 'very strongly agree', the extent to which they agree with each statement in relation to themselves in general. A number of the items in this measure were reverse scored. A higher score indicates greater general self-efficacy.

Validation data of the general self-efficacy scale suggests that it is empirically sound. This scale was validated on 376 introductory psychology students and shown to have excellent construct validity. Sherer et al.'s (1982) General Self-efficacy Scale was significantly correlated with several other measures of personality at the .001 level including interpersonal competency (.451) and ego strength (.290) (Sherer et al., 1982) and obtained a Cronbach alpha of .86 for internal consistency and reliability.

Further to this, test-retest reliability was demonstrated as another sample of 298 introductory psychology students replicated the Cronbach alpha value of greater than .80 (Sherer et al., 1982). Criterion validity for the General Self-efficacy scale was also demonstrated in this study using a sample of 150 inpatients from a war veterans hospital, as general self-efficacy scores were positively associated with educational level and military rank (Sherer et al., 1982).

Well-being

- *Positive Affect, Negative Affect Schedule (PANAS)*

Positive affect, negative affect, and happiness was assessed using the PANAS (Watson et al., 1988). This scale consists of 20 items (10 positive words and 10 negative words) which form a positive affect subscale and a negative affect subscale. Respondents rate using a 5 point Likert scale, ranging from 'very slightly' or 'not at all' to 'extremely', how each particular word describes their feelings and emotions during the last few weeks. No items are reverse scored, a higher score on a subscale reflects a high presence of either positive or negative affect. Happiness can be measured as the difference between the positive and negative affect subscales.

The PANAS has been validated using the 'past few weeks' time frame as used in this study on samples of both university employees and university undergraduates. For the positive affect subscale the mean for university employees was 33.1 and the standard deviation was 6.8. For the negative affect subscale the mean for university employees was 17.9 and the standard deviation was 6.4. Using the same time frame and a sample of university employees internal consistency reliabilities were demonstrated as .86 for positive affect subscale and .87 for negative affect subscale. The scale intercorrelation was -.09. With test-retest reliabilities of .58 for positive affect and .48 for negative affect (Watson et al., 1988).

- *General Life Satisfaction*

To assess general life satisfaction Campbell et al.'s (1976) a single item scale was utilised in this study. It is a subscale from Campbell et al.'s (1976) Index of Well-being. Respondents simply rate on a 7 point Likert scale, ranging from 'completely dissatisfied' to 'completely satisfied', how satisfied or dissatisfied they feel at the moment with life in general.

As general life satisfaction was measured with a single item most of the usual and important statistics were unavailable and irrelevant in this instance. This was not of concern as Highhouse and Becker (1993) concluded that single-item global measures can in fact have more content validity than composite facet measures.

- *Goldberg Health Questionnaire - 28 (GHQ-28)*

Two subscales from the GHQ-28 were selected for this study, they were, the somatic symptoms subscale (GHQA) and the social dysfunction subscale (GHQC). Physical well-being was measured by 14 items, none of which were reverse scored. For this study the GHQ items were scored using the simple Likert scoring system (0, 1, 2, 3) as it is the least likely scoring system to misclassify participants (Goldberg & William, 1988). Responses are registered on a four point Likert system for medical complaints and general health over the last few weeks (refer to Appendix B). The Likert scale was anchored to the following responses depending on the question, for example: 'better than usual' or 'the same as usual'.

The GHQ manual (Goldberg & Williams, 1988) is unclear as to which versions of the GHQ has been used for reporting the psychometric data. Out of the five versions of the GHQ the GHQ-28 is the least documented, although, the manual firmly states that the GHQ-28 is the version to be used for research purposes. According to the manual all versions of the GHQ have alpha internal consistencies above .82. Further to this the manual reports that the GHQ-28 has a median coefficient between GHQ and interview measures of .76 using an unidentified sample.

Procedure

This research involves a parallel project investigating the study of the impact of e-mail on staff well-being and their work related attitudes. There are two parts to the

research, one studying the influence that satisfaction with communication and workplace relationships has on the relationship between e-mail attitude and organisational commitment, and the other exploring the role of computer, e-mail, and general self-efficacy on the relationship between e-mail attitude and well-being.

The focus of this thesis is on the latter part of the parallel project. Both pieces of research were developed separately through the process of hypothesis generation, questionnaire development, ethics approval, subsequent data analyses, and the documentation of findings. The projects were combined only at the data collection stage, in the form of a questionnaire containing both sets of scales.

The Massey University Human Ethics Committee (Albany) was forwarded a research proposal which detailed the rationale and objectives of the research. The committee approved the intended methods to be utilised in the research. Approval for access to participants was obtained from the Principal of Massey University (Albany). Approval for access to the Human Resource Sections employment database was obtained from the Head of this department after being forwarded a copy of the ethics proposal and subsequent ethics approval.

University staff were informed of the research in their internal, fortnightly, organisational-wide communication 'Massey News' to increase response rates (Schaefer & Dillman, 1998). The questionnaires were then distributed to the total sample population of 2253, through Massey University's internal mail system.

The questionnaire pack sent to each participant contained the following:

- An information sheet (see Appendix B) inviting university staff to participate in the research. This sheet included a clear description of the nature and duration of the participant's involvement in the research. Further to this, the information sheet reminded potential participants that participation was voluntary and it informed potential participants of their right to decline participation, withdraw at any time, or refuse to answer any particular questions. Potential participants were also assured that their individual results would be anonymous, thus ensuring confidentiality. Participants were also informed that they would be given access to a summary of the results at the conclusion of the study.
- A questionnaire on e-mail attitude, well-being, self-efficacy, satisfaction, work commitment, and various demographics (see Appendix B).

- A self addressed envelope for Massey University's Internal Mail System intended to maximise the response rate through reducing the effort required to return the questionnaire to the researchers.

As questionnaires were returned to the researchers they were processed and coded. The data was entered into an Excel data file and converted to an SPSS file. All analyses of the data were conducted using the Statistical Package for Social Sciences Software Package (SPSS), version 6.0. Prior to conducting any analyses the data was screened to check for accuracy of input. Ten percent of questionnaires were randomly selected, and checked for possible input errors in the data file. No inaccuracies were found in the data input. Then the maximum and minimum variable scores in the data file were checked to assess the presence of idiosyncratic data. It was ensured that all the data corresponded with the codes each variable had been assigned in the codelist that was established.

Missing values were then dealt with. Where a scale had one or two missing values only, the other values in the scale were averaged and this value was assigned in the space of the missing value (Tabachnick & Fiddell, 1989). Where participants had more than one or two pieces of information omitted the data for those participants on that scale containing the missing values was deleted.

Demographic information

Demographic information was collected on variables which were identified in the literature as possibly influencing e-mail attitude, self-efficacy, and well-being. The main demographics explored in this study could be grouped in terms of personal details (for example, gender), university related (such as position), and e-mail/computer related, (for example, average number of e-mails sent per day). Due to the small size of some groups once classified into campus, age, college, gender and length of time with the organisation demographics care was taken to have broad categories to ensure participants could not be identified.

Analyses

The analyses used in this study included both descriptive and inferential statistics. Descriptive statistics were assessed in order to analyse the participants in this study in terms of demographic variables. Measures of central tendency and Pearson product-moment correlations were conducted to assess the relationships between variables. Cronbach alphas were obtained to estimate the internal reliability for the scales. Independent samples *t*-tests were conducted to evaluate whether there were significant differences between means in terms of various demographic variables and e-mail attitude, well-being, e-mail use, and computer, e-mail, and general self-efficacy. Levene's test for homogeneity of variances was computed for each *t*-test. Where homogeneity could not be assumed the more conservative value of *t* was used as the statistic for testing the significance of differences in means.

A one way analysis of variance (ANOVA) was conducted to assess whether the age group means on the dependent variables of e-mail attitude, e-mail use, well-being, and computer, e-mail, and general efficacy differed significantly from each other. Significant differences were followed up with Tukey-HSD or Dunnett's C to compare each pair of group means.

To test the potential mediating or moderating role of measures of self-efficacy (general, computer, and e-mail) on the relationship between e-mail attitude and well-being, multiple regression analyses were used (Baron and Kenny, 1986).

Chapter Six: Results

Descriptive Statistics

Means and standard deviations for the scales appear in Table 3. For all the scales with several items, the coefficients of internal consistency (Cronbach's alpha) indicate a moderately high to high level of reliability (.76 to .96) for the present sample, above Nunnally's (1978) level of .6 acceptability. Where appropriate *t*-tests and degrees of freedom were calculated to answer research question 3, 9, and 14, which compared the results of the present study to existing research.

The mean for e-mail attitude (38.04) was moderately high given the possible range of 10 to 50, indicating a positive attitude towards e-mail as a communication medium. The mean for e-mail usage (26.40) suggested only moderate e-mail usage from the present sample when compared to its potential range of 0 to 45. Comparing the mean e-mail usage scores of the present sample (M=26.40, SD=5.65) with the mean scores for Minsky and Marin's (1999) sample (M=26.70, SD=7.54), there was no significant difference between scores, $t(689)=-0.54$, $p > .05$. Further to this, the coefficients of internal consistency were similar.

General efficacy had a high mean score (90.37) given its range of 17 to 119, showing a high level of general efficacy among university staff. For computer efficacy, the moderate, mean score for the present sample (M=62.36, SD=21.38) was significantly lower than the mean score for Minsky and Marin's (1999) sample (M=68.65, SD=21.38), $t(726)=-3.31$, $p < .001$. The magnitude of computer efficacy (9.25) among university staff was very high given the maximum magnitude score was 10. The mean score for e-mail efficacy (66.37) was moderate given its possible range of 0 to 100, showing a moderate level of e-mail efficacy among university staff. The mean magnitude score for e-mail efficacy of 9.42 demonstrated a very high confidence in e-mail use among university staff members.

As reported in Table 3 both somatic symptom and social dysfunction achieved relatively low means given the possible range of 0 to 21. This indicates 'wellness' in terms of low levels of physical and psychological strain.

The NA subscale of the PANAS continued this theme of a relatively low mean (15.96) when compared to PA. As PA reported a mean just over double that of NA, signalling a more positive minded workforce at Massey University. Comparing the mean affect scores of the present sample with the mean scores of the PANAS manual scores for university employees using the same time frame, there were significant differences noted. The mean and alpha for PA was significantly higher in the present study than the manual, $t(703)=2.05$, $p < .05$, while the NA of the present study achieved a significantly lower mean, standard deviation, and alpha than the PANAS manual, $t(697)=-3.81$, $p < .001$.

Table 3
Descriptive statistics for scales

Scale	N	Mean	SD	α	*t*	df
E-mail attitude	567	38.04	4.98	.76		
E-mail Usage					-0.54	689
Present study	528	26.40	5.65	.83		
Minsky & Marin (1999)	163	26.70	7.54	.89		
General Efficacy	565	90.37	11.52	.88		
Computer Efficacy Total					-3.31***	726
Present study	565	62.36	21.38	.94		
Minsky & Marin (1999)	163	68.65	21.38	-		
Computer Efficacy Magnitude	565	9.25	1.50			
E-mail Efficacy Total	551	66.37	22.22	.96		
E-mail Efficacy Magnitude	551	9.42	1.34			
Somatic symptom	556	5.18	3.76	.84		
Social dysfunction	557	6.70	2.40	.78		
General Life Satisfaction	552	5.20	1.13	-		
Positive Affect (PA)					2.05*	703
Present study	541	34.27	6.29	.87		
PANAS manual	164	33.10	6.80	.86		
Negative Affect (NA)					-3.81**	697
Present study	535	15.96	5.48	.84		
PANAS manual	164	17.90	6.40	.87		

* $p < .05$, ** $p < .01$, *** $p < .001$, two tailed *t*-tests

Note: The alpha coefficient for the General Life Satisfaction Scale is absent from this table as it is a single item measure.

Factor analysis of E-mail attitude

Factor analysis procedures were applied to the e-mail attitude scale to answer research question 1. Firstly, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used to determine whether factor analysis was appropriate. The KMO for the e-mail attitude scale was .78 which is more than satisfactory for factor analysis to be appropriate.

With the e-mail attitude scale Principal Components Analysis (PCA) procedures were used to analyse the item pool. Results from PCA indicated that the ten e-mail attitude items could be interpreted more meaningfully by collapsing many of the predictor items into factors. Appendix C provides the factor matrices for the initial iterations. From the analysis three factors were selected to be retained and accounted for an acceptable amount of the total variance (62.5%). The number of factors to be retained were selected according to two criteria: eignenvalues greater than one, and the scree plot test (Green, Salkind, & Akey, 1997). All three factors had eigenvalues greater than one. A scree plot highlighted those factors as being adequate and sufficient.

Following PCA the ten e-mail attitude items were rotated using the VARIMAX rotation procedure. The rotated solution more clearly yielded three factors, although, failed to demonstrate improvement in explained variance as 48.9% of variance was explained after rotation. However, the rotated solution was deemed more parsimonious. Careful consideration was given to those factors which had only two items loading onto it in terms of: the items correlations with each other and their correlations with other items (Tabachnick & Fidell, 1989).

Given these criteria, Factors 2 and 3 were examined as each had only two items loading onto them. The rotation was run again forcing two factors. Factors 2 and 3 were both kept, as three factors explained 7.9% more variance than an equivalent two factor solution.

One item did not load clearly onto any one factor which was item number 1 ('I like using e-mail'), therefore, it was omitted from further analysis. Applying the above criteria resulted in the retention of nine items from the e-mail attitude scale that loaded neatly onto three factors. This solution increased the amount of explained variance by 1.2% as well as resulting in a more parsimonious solution.

The resultant factors appear to have identifiable clusterings of variables that have sensible interpretations. Table 4 presents the three factors, the items within them, the communalities, and the constructs that they have been identified to represent.

Table 4
E-mail attitude - the three factors identified through PCA and VARIMAX rotation procedures

Item	Factor 1 Affect	Factor 2 Cognition	Factor 3 Behaviour	Communality
E-mail helps me with my position. (item 10)	**.70**	.05	.06	.50
E-mail is a efficient method of communication. (item 2)	**.60**	.17	36	.52
E-mail is a convenient method of communication. (item 3)	**.59**	.14	.37	.50
I have access to more information using e-mail. (item 7)	**.52**	.07	.16	.30
Most of my e-mail is important. (item 6)	**.47**	.03	.06	.23
I have difficulty editing e-mail messages. (item 9)	.04	**.99**	.07	.42
I have difficulty sending e-mail messages. (item 8)	.15	**.63**	.03	.99
I prefer using e-mail to the telephone. (item 6)	.20	.07	**.78**	.66
I prefer using e-mail to face to face communication. (item 5)	.15	.00	**.60**	.38

The first factor was termed 'Affect' because of its high loadings on variables that related directly to how the participant feels about communicating with others using e-mail. This included items 10, 2, 3, 7, and 6. Affect explained 29.2% of item variance and had .73 internal consistency.

Factor 2, designated as 'Cognitive' included items related to participants perceived problems with using e-mail. It included items 9 and 8. Factor 2 accounted for 13.7% of the item variance and .78 internal reliability.

The third factor was termed 'Behaviour' as it related to using e-mail compared to other methods of communication. This factor comprised of items 6 and 5. Seven point two percent of the item variance was accounted for by factor 3, which had .68 internal consistency.

Overall it is apparent that to account for an adequate amount of the total variance in e-mail attitude, three factors were required. In effect then factor analysis slightly

reduced the number of variables involved in the prediction of e-mail attitude. One item was removed completely, and of the remaining items all load onto only one factor. This analysis makes the suggestion that e-mail attitude can be assessed according to these varying groups of items, each of which offers different attitude information. Given that reasonably clear factors emerged it was decided to conduct further analyses to investigate the possible relationships between the three identified attitude factors and other variables in this study.

Comparisons Within The Present Sample

Gender, position, and location

Independent samples *t*-tests were conducted to evaluate whether the gender, position, and location of university staff were related to their scores on e-mail attitude, e-mail usage, efficacy, and well-being scales. The results of these evaluations are reported in Table 5 and relate to research questions 2, 5, 11, and 12, which investigate significant relationships and differences between various variable scales and demographics.

No significant differences were found between gender and e-mail attitude components or gender and facets of well-being. However, significant differences were found between gender and two of the efficacy scales: e-mail efficacy and computer efficacy. For computer efficacy, males (M=65.96, SD=21.73) had significantly higher mean scores than females (M=58.67, SD=21.61), $t(562)=3.96$, $p < .001$. For e-mail efficacy, males (M=69.74, SD=22.16) had significantly higher mean scores than females (M=63.72, SD=22.10), $t(544)=3.15$, $p < .01$.

No significant differences were found between position and e-mail attitude components or position and types of efficacy. However, significant differences were found between position and e-mail usage, and position and the positive affect facet of well-being. For e-mail usage academics (M=27.08, SD=5.80) had significantly higher mean scores than general staff (M=25.31, SD=6.59), $t(512)=2.22$, $p < .001$. For positive affect, academics (M=35.07, SD=6.40) had significantly higher mean scores than general staff (M=33.65, SD=6.20), $t(518)=2.58$, $p < .01$.

No significant differences were found between location and e-mail attitude components, types of efficacy, facets of well-being, or e-mail usage.

Age and scaled scores

A one-way analysis of variance (ANOVA) was conducted to test the differences in means for the three age groups on each of the scale variables and partially answers research questions 2, 5, 11, and 12 which investigates significant relationships and differences between various scale variables and demographics. Table 6 shows that the one-way ANOVA yielded statistically significant differences in age group means for the affective and cognitive e-mail attitude components $F(2, 558)=4.96$, $p < .01$, and $F(2, 558)=3.88$, $p < .05$ respectively, e-mail usage $F(2, 526)=3.52$, $p < .05$, computer and e-mail efficacy $F(2, 560)=17.80$, $p < .001$ and $F(2, 543)=15.73$, $p < .001$ respectively, somatic symptom $F(2, 547)=5.59$, $p < .05$, years as a computer user $F(2, 537)=14.78$, $p < .001$, years of e-mail use $F(2, 537)=9.22$, $p < .01$, and typing speed $F(2, 516)=501$, $p < .05$. Age group 1, less than 30 years of age, had the highest mean score for the following variables: affective and cognitive e-mail attitude components, e-mail usage, computer and e-mail efficacy and somatic symptom.

For the affective component of e-mail attitude, computer and e-mail efficacy, and somatic symptom, mean scores for age group two, 30 to 50 years of age, were significantly higher than the mean scores for the oldest age group, 50 plus years of age. For years as a computer use and e-mail use mean scores for age group three, 50 plus years of age, were significantly higher or equal to the mean scores for age group one and two respectively.

Table 5
Comparison of means for gender, position, and location

Scale	N	Mean	SD	N	Mean	SD	*t*	df
		Female			**Male**			
E-mail attitude								
Affect	316	20.23	2.80	246	20.36	2.81	0.52	560
Behaviour	316	7.54	1.86	246	7.44	2.00	-0.62	560
Cognition	316	5.93	1.60	246	5.78	1.73	-1.14	560
E-mail usage	295	26.17	6.02	235	26.08	6.58	-0.15	528
General efficacy	317	90.54	13.62	247	88.84	13.87	-1.45	562
Computer efficacy	317	58.67	21.61	247	65.96	21.73	3.96***	562
E-mail efficacy	310	63.72	22.10	236	69.74	22.16	3.15**	544
Somatic symptom	308	5.26	3.78	243	5.10	3.77	-0.47	549
Social dysfunction	309	6.59	2.27	243	6.82	2.56	1.10	550
PA	306	34.28	6.17	230	34.37	6.42	0.16	534
NA	302	15.62	5.58	228	16.36	5.30	1.54	528
General Life Sat.	306	5.24	1.10	241	5.14	1.17	-1.03	545
		Academic			**General**			
E-mail attitude								
Affect	271	20.44	2.75	273	20.20	2.89	0.98	542
Behaviour	271	7.55	1.94	273	7.50	1.90	0.23	542
Cognition	271	5.99	1.70	273	5.80	1.60	1.31	542
E-mail usage	253	27.08	5.79	261	25.31	6.59	3.22***	512
General efficacy	272	89.41	13.58	274	89.73	14.07	-0.27	544
Computer efficacy	272	61.31	22.99	274	62.08	20.90	-0.40	544
E-mail efficacy	260	66.37	22.90	268	66.03	21.90	0.17	526
Somatic symptom	262	5.03	3.38	273	5.27	3.94	-0.74	533
Social dysfunction	263	6.80	2.45	273	6.55	2.38	1.23	534
PA	254	35.07	6.38	266	33.65	6.20	2.58**	518
NA	251	16.25	5.54	263	15.71	5.45	1.10	512
General Life Sat.	266	5.22	1.14	266	5.18	1.12	0.38	530
		Albany			**Palmerston North**			
E-mail attitude								
Affect	75	20.49	2.66	483	20.27	2.82	0.63	556
Behaviour	75	7.43	1.99	483	7.53	1.89	-0.43	556
Cognition	75	6.00	1.62	483	5.86	1.67	0.68	556
E-mail usage	72	26.24	5.94	455	26.12	6.35	0.14	525
General efficacy	76	91.04	10.33	484	89.62	14.21	0.84	558
Computer efficacy	76	62.34	20.15	484	62.02	22.14	0.12	558
E-mail efficacy	75	67.60	21.30	468	66.27	22.47	0.48	541
Somatic symptom	72	5.27	3.86	475	5.14	3.75	0.25	545
Social dysfunction	72	6.53	2.08	476	6.70	2.43	-0.56	546
PA	68	34.25	6.32	465	34.30	6.30	-0.06	531
NA	66	15.62	4.86	461	15.97	5.55	-0.48	525
General Life Sat.	72	5.24	1.18	471	5.19	1.12	0.31	541

* $p < .05$, ** $p < .01$, *** $p < .001$, two tailed *t*-tests

Table 6
Comparison of means for age groups

	(1) Less than 30 years			(2) 30 to 50 years			(3) 50 plus years			F	df	Tukey's HSD/ Dunnett's C
	N	Mean	SD	N	Mean	SD	N	Mean	SD			
E-mail attitude												
Affect	86	20.72	2.82	305	20.48	2.67	168	19.74	2.97	4.96**	(2, 558)	(1)=(2)>(3)
Behaviour	86	7.93	1.95	305	7.46	1.84	168	7.36	2.03	2.69	(2, 558)	-
Cognition	86	6.16	1.53	305	5.93	1.71	168	5.59	1.59	3.88*	(2, 558)	(1)>(3)=(2)
E-mail usage	83	27.29	5.47	284	26.37	6.35	160	25.18	6.38	3.52*	(2, 526)	(1)>(3)=(2)
General efficacy	86	90.23	14.20	306	89.49	12.38	169	90.13	15.89	0.17	(2, 560)	-
Computer efficacy	86	69.70	17.75	306	64.06	21.25	169	54.48	22.57	17.80***	(2, 560)	(1)>(2)>(3)
E-mail efficacy	86	75.05	17.07	297	67.68	21.59	161	59.34	23.96	15.73***	(2, 543)	(1)>(2)>(3)
Somatic symptom	84	5.75	3.97	299	5.47	3.83	165	4.39	3.45	5.59*	(2, 547)	(1)=(2)>(3)
Social dysfunction	85	6.35	2.00	299	6.88	2.52	165	6.52	2.37	2.17	(2, 548)	-
PA	83	34.41	5.57	290	34.08	6.20	160	34.81	6.76	0.71	(2, 532)	-
NA	83	15.93	4.91	287	15.82	5.34	157	16.17	6.01	0.21	(2, 526)	-
General Life Sat.	84	5.21	.92	294	5.21	1.13	166	5.17	1.23	0.07	(2, 543)	-
Years as a computer user	86	8.42	4.01	300	11.48	5.73	167	13.96	8.07	14.78***	(2, 537)	(1)<(2)<(3)
Years as a e-mail user	86	4.42	2.10	300	6.28	3.38	166	7.07	3.84	9.22**	(2, 537)	(1)<(2)=(3)
Typing speed	84	3.82	1.08	285	3.38	1.15	164	3.37	1.29	5.01*	(2, 516)	(1)=(2)<(3)

* $p < .05$, ** $p < .01$, *** $p < .001$

Correlational analyses

Pearson product-moment correlation coefficients were computed among the variables and certain demographics (Table 8) to answer research questions 2, 4, 5, 7, 10, 11, 12, 13, and 15.

For years of computer use and general life satisfaction, and e-mail usage and somatic symptom there was no computed relationship between the pairs of variables (r =.00). The strongest relationship computed in Table 7 was between computer efficacy and e-mail efficacy (r =.89, p <.001), which suggests a confounding relationship.

Overall, years of computer use was positively related to years of e-mail use (r =.59, p <.001), computer efficacy (r =.29, p <.001), and e-mail efficacy (r =.31, p <.001). Further to this, years of e-mail use was positively related to e-mail usage, the affective component of e-mail attitude, the cognitive component of e-mail attitude, computer efficacy, and e-mail efficacy (r =.19, .15, .14, .23, .27 respectively, p <.001).

Interestingly, typing speed achieved only one significant relationship, which was with general efficacy (r =.15, p <.001). E-mail usage was significantly related to: the affective e-mail attitude component (r =.34, p <.001), the behavioural e-mail attitude component (r =.11, p <.01), the cognitive e-mail attitude component (r =.29). Components of e-mail attitude were only significantly related to disappointingly few measures of well-being. The affective e-mail attitude component achieved only one positive relationship: positive affect (r =.17, p <.001). In contrast the behavioural e-mail attitude component was positively related to general life satisfaction (r =.12, p <.01) and negatively related to somatic symptom (r =-.13, p <.01) and negative affect (r =-.21, p <.001). The cognitive e-mail attitude component was not significantly linked to any measures of well-being.

General efficacy according to the results of Table 7 was positively related to both computer (r =.27, p <.001) and e-mail efficacy (r =.24, p <.001), and also significantly correlated to four out of the five measures of well-being: general life satisfaction, positive affect, social dysfunction, and negative affect (r =.27, .38, -.19, -.30 respectively, p <.001). As previously mentioned computer efficacy was significantly related to e-mail efficacy, as well as directly related to positive affect (r =.12, p <.01) and negatively associated with negative affect (r =-.15, p <.001). Finally e-mail efficacy was positively correlated to positive affect (r =.12, p <.01) and negatively linked to negative affect (r =-.15, p <.001).

All measures of well-being in this study achieved significant relationships with one another. Somatic symptom achieved a significant relationship with all of the other measures of well-being, social dysfunction, negative affect, general life satisfaction, and positive affect (r =.35, .33, -.21, -.26 respectively, p <.001). Further to this, social dysfunction was significantly linked to negative affect (r =.29, p <.001) and negatively related to general life satisfaction (r =-.25, p <.001) and positive affect (r =-.44, p <.001). General life satisfaction was also positively related to positive affect (r =.43, p <.001) and negatively linked to negative affect (r =-.33, p <.001) and finally positive affect with negative affect (r =-.20, p <.001).

Table 7
Pearson product-moment correlations among computer usage variables and scales

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.Computer use (years)														
2. E-mail use (years)	.59													
3. Typing speed	-.03	.02												
4. E-mail usage	.11	.19	.09											
5. Attitude: Affect	.11	.15	.10	.34										
6. Attitude: Behaviour	.10	.08	.04	.11	.21									
7. Attitude: Cognition	.10	.14	.12	.29	.38	.11								
8. General efficacy	-.01	-.03	.15	.04	.10	.19	-.07							
9. Computer efficacy	.29	.23	.08	.18	.24	.30	.11	.27						
10. E-mail efficacy	.31	.27	.11	.21	.24	.32	.15	.24	.89					
11. Somatic symptom	-.02	-.02	.01	.00	-.01	-.13	.08	-.06	-.04	-.02				
12. Social dysfunction	-.01	-.03	-.08	-.06	-.08	-.08	-.03	-.19	-.10	-.05	.35			
13. General Life Sat.	.00	.02	.09	.05	.07	.12	-.01	.27	.05	.08	-.21	-.25		
14. PA	.06	.05	.08	.15	.17	.07	-.01	.38	.12	.12	-.26	-.44	.43	
15. NA	.02	-.03	-.11	-.02	-.05	-.21	.03	-.30	-.15	-.14	.33	.29	-.33	-.20

Absolute values of r > .09, p <.05; r > .11, p <.01; r >.15, p <.001
Note: Ns vary depending upon missing values ~ 569

Attitude, efficacy, and well-being

Four hierarchical multiple regression analyses were conducted to test the hypothesis that self-efficacy mediates the relationship between e-mail attitude and well-being (Baron & Kenny, 1986). Moderator effects were omitted because Baron and Kenny (1986) noted that the moderating variable should not be correlated with both the predictor and the criterion variables, due to the need to provide a clearly interpretable interaction term. For the present sample, all components of e-mail attitude, self-efficacy, and well-being were significantly correlated with each other (Table 7).

In the first step of each multiple regression, the three components of e-mail attitude were used to predict the level of the dependent variable, a specified facet of well-being. In the second step, the three measures of efficacy were entered to determine if e-mail attitude retained any predictive power.

According to Baron and Kenny (1986), if the result of entering the efficacies is simply to reduce the significance of the attitude-well-being link, then efficacy can be considered a partial mediator. If, on the other hand, the result is that the attitude-well-being link is non-significant, then efficacy is a complete mediator.

Table 8 shows the results of four, separate, hierarchical regressions. In the first regression the affective component of e-mail attitude predicted positive affect (β=.171, p <.001), accounting for 2.5% of the variance in positive affect scores in step one, R^2 = .030, $F(3, 524)=5.41$, p =.001. In the second step, adding in the efficacy components the R^2 increased significantly in value to .147, $F(3, 521)=23.76$, p <.001. The affective e-mail attitude component still significantly predicted positive affect (β=.129), t=2.89, p <.01, but the amount of variance explained decreased from 2.5% to 1.6%. Only general efficacy (β=.354) significantly predicted positive affect scores, t=8.20, p <.001, accounting for 11.4% of the variance in positive affect scores. Therefore, general efficacy had a significant partial mediating effect on the prediction of positive affect by the affective attitude component.

In the first step of the second regression the behavioural component of e-mail attitude predicted negative affect (β=-.197, p <.001), accounting for 3.8% of the variance in negative affect, R^2 = .042, $F(3, 518)=7.62$, p <.001. In the second step, adding the efficacy components the R^2 increased significantly in value to .113, $F(3, 515)=13.59$, p <.001. The behavioural component of e-mail attitude still significantly predicted negative affect (β=-.140), t=-3.15, p <.01, but the amount of explained

variance decreased from 3.8% to 1.9%. Only general efficacy (β=-.267) significantly predicted negative affect, t=-6.01, p <.001, accounting for 6.6% of the variance in negative affect scores. Therefore, general efficacy had a significant partial mediating effect on the prediction of negative affect by the behavioural attitude component.

In the third regression in Table 8 the behavioural (β=-.122, p <.01) and cognitive (β=.122, p <.01) e-mail attitude components predicted somatic symptom in step one accounting for a combined 2.7% of the variance in somatic symptom, R^2=.026, F(3, 534)=4.806, p <.01. In the second step adding the efficacy components the R^2 did not significantly increase in value, R^2=.031, F (3, 531)=.856. Both the behavioural (β=-.119), t=-2.59, p <.01 and cognitive (β=.111), t=2.37, p <.05 components of e-mail attitude still significantly predicted somatic symptom, although the amount of explained variance decreased from 2.7% to 2.3%. None of the efficacies reached the threshold to significantly predict somatic symptom. Therefore it can be concluded that efficacy does not mediate, either completely or partially, the prediction of somatic symptom by the behavioural and cognitive components of e-mail attitude.

Finally the fourth regression in Table 8 shows that in the first step the behavioural component of e-mail attitude predicted general life satisfaction (β=.116, p <.01), accounting for 1.3% of the variance in general life satisfaction responses, R^2=.018, F(3, 532)=3.26, p <.05. In the second step, adding the efficacy components the R^2 increased significantly to .076, F(3, 529)=10.98, p <.001. In the second step the behavioural component of e-mail attitude failed to continue to significantly predict general life satisfaction. Only general efficacy (β=.246), t=5.54, p <.001, predicted general life satisfaction accounting for 5.5% of the variance in general life satisfaction. Therefore, general efficacy had a complete mediating effect on the prediction of general life satisfaction from e-mail attitude. Because none of the components of e-mail attitude were significantly correlated with social dysfunction (Table 7), regression was not computed for the prediction of attitude on social dysfunction.

Table 8
Hierarchical multiple regressional analyses of the effects of attitude, efficacy, and well-being

	B	SEB	Beta	*t*	Overall % variance
Dependent Variable: Positive Affect					
Step One (R^2=.030)					
E-mail attitude					
Affect	.388	.106	.171	3.66***	2.5
Behaviour	.146	.144	.044	1.01	0.2
Cognition	-.317	.174	-.084	-1.82	0.6
Step Two (R^2=.147)					
E-mail attitude					
Affect	.293	.101	.129	2.89**	1.6
Behaviour	-.068	.142	-.021	-0.48	0.0
Cognition	-.113	.167	-.030	-0.70	0.0
General efficacy	.185	.023	.354	8.20***	11.4
Computer efficacy	-.028	.026	-.077	-0.89	0.2
E-mail efficacy	.021	.025	.075	0.87	0.1
Dependent Variable: Negative Affect					
Step One (R^2=.042)					
E-mail attitude					
Affect	-.056	.093	-.029	-0.61	0.0
Behaviour	-.561	.125	-.197	-4.49***	3.8
Cognition	.233	.152	.071	1.53	0.5
Step Two (R^2=.113)					
E-mail attitude					
Affect	.021	.091	.011	0.23	0.0
Behaviour	-.399	.127	-.140	-3.15**	1.9
Cognition	.092	.150	.028	0.62	0.1
General efficacy	-.122	.020	-.267	-6.01***	6.6
Computer efficacy	.007	.023	.029	0.33	0.0
E-mail efficacy	.014	.022	-.058	-0.65	0.0
Dependent Variable: Somatic symptom					
Step One (R^2=.026)					
E-mail attitude					
Affect	-.040	.063	-.030	-0.64	0.1
Behaviour	-.239	.086	-.122	-2.80**	1.4
Cognition	.275	.104	.122	2.65**	1.3
Step Two (R^2=.031)					
E-mail attitude					
Affect	-.034	.064	-.025	-0.53	0.1
Behaviour	-.233	.090	-.119	-2.60**	1.3
Cognition	.250	.105	.111	2.40**	1.0
General efficacy	.008	.014	-.030	-0.67	0.1
Computer efficacy	-.022	.016	-.125	-1.35	0.3
E-mail efficacy	.021	.016	.127	1.36	0.3
Dependent Variable: General Life Satisfaction					
Step One (R^2=.018)					
E-mail attitude					
Affect	.021	.019	.052	1.10	0.2
Behaviour	.068	.026	.116	2.64**	1.3
Cognition	-.037	.031	-.055	-1.12	0.3
Step Two (R^2=.076)					
E-mail attitude					
Affect	.121	.019	.030	0.64	0.1
Behaviour	.448	.027	.075	1.68	0.5
Cognition	-.162	.031	-.024	-0.52	0.0
General efficacy	.233	.004	.246	5.54***	5.5
Computer efficacy	-.081	.005	-.152	-1.67	0.5
E-mail efficacy	.065	.005	.127	1.34	0.4

* p <.05, ** p <.01, *** p <.001

Chapter Seven: Discussion

The overall findings are the result of exploratory research. Previous research with a cross section of university staff members is limited and research using the key variables of the study, such as well-being, is quite fragmented. Hence, many of the research questions investigated in this thesis have not emerged from previous research nor are they able to be compared to previous research.

The results of this study provide preliminary evidence of the relationships among the three components of e-mail attitude, efficacy (general, computer, and e-mail), and measures of well-being, for a cross section university staff members. The results also provide an interesting window into characteristic profiles for a sample of New Zealand university staff members.

The findings of this thesis suggest that this sample of university staff, as a group, have a moderately positive attitude towards e-mail and engage in moderate levels of e-mail usage. Further to this, the university staff members of this study differ substantially from corresponding efficacy and well-being scores generated in available previous research (Minsky & Marin, 1999; Watson et al., 1988). The results of the present study will be discussed in relation to the research questions proposed through the course of the literature review.

Factor structures of the e-mail attitude scale

The e-mail attitude scale was examined to investigate the presence of any underlying constructs. The Principal Components Analysis (PCA) and VARIMAX rotation procedures conducted with the e-mail attitude scale developed from the work of Minsky and Marin (1999), and utilised in this study, indicated the presence of three explainable factors which accounted for 50.1% of the variance. The first factor, 'Affect', includes questions relating to how the participant felt about communicating with others using e-mail. Factor two, 'Cognition', included questions relating to problems participants perceive with using e-mail. Finally, factor three, 'Behaviour', included questions relating to using e-mail compared to other methods of communication such as the telephone.

This three factor solution of the e-mail attitude scale reflected the tricomponent perspective of an attitude consisting of 'Affective', 'Behavioural', and 'Cognitive' elements (Ajzen, 1988; Triandis, 1971) and explained a suitable amount of variance. The rank weightings of each attitude component were consistent with existing attitude literature from the tricomponent perspective (Eagly & Chaiken, 1993; Eiser & van der Pligt, 1988; Triandis, 1971). 'Behaviour' was highlighted as the weakest attitude component because it measures a person's predisposition to act, but does not always reflect an individual's actual behaviour and private convictions (Eagly & Chaiken, 1993). For example, in this study the behavioural component of e-mail attitude was weakly related to the level of actual e-mail usage.

The 'Affective' component emerged as the strongest attitude component, which probably influenced the direction and strength of the other components (Eiser & van der Pligt, 1988; Lavine et al., 1998). The influence of the affective e-mail attitude component is demonstrated in this study by the strength of relationship that emerged between level of e-mail usage and the affective e-mail attitude component or one's feelings toward the medium.

The 'Cognitive' component was the middle ranking component that appears to bridge the gap between an individual's feelings toward a medium and their actual behaviour (Henerson et al., 1987; Triandis, 1971), this is also reflected in its moderate relationship with e-mail usage. Preliminary evidence indicates good reliabilities across the three factors, although it is conceded that further work is required on the scale in the future in terms of the behavioural and cognitive factors which each consisted of two items and further validation studies. Further statistical analyses were performed to evaluate relationships between the three factor scores and other variables including demographics investigated in the present study.

E-mail attitude and key demographics

I was unable to find any previous research addressing e-mail attitude from the tricomponent perspective and issues such as demographics. However, the results of this study confirm Harrison and Rainer's (1992) observation: attitude is impacted by certain categories of demographic information. The results indicated no significant difference or relationship between any of the three e-mail attitude factors and the gender, position, or the campus location of participants. In contrast, there were significant differences

between age and specific components of attitude towards e-mail. Participants aged less than 30 years had similar affective e-mail attitude scores or feelings about communicating with others using e-mail, to participants aged between 30 and 50 years. However, both of these previously mentioned age groups had significantly higher levels of affective e-mail attitude than participants older than 49 years of age.

Perhaps this finding suggests that staff with less fixed communication expectations and experiences were more likely to feel comfortable with and see the benefits of communicating with others via e-mail. Or perhaps this result is due to administrative time restraints that are placed on older staff members, who in a university setting are more likely to have other demands on their time such as administration of sections and chairing various committees, and less time to learn and familiarise themselves with e-mail as it is still considered a relatively 'new' communication medium.

Participants aged less than 30 years had significantly lower levels of difficulty associated with using e-mail (the cognitive e-mail attitude) than participants aged 30 plus years of age. The former age group also felt significantly more comfortable using e-mail to communicate and had a higher level of e-mail usage. Therefore, it appears that the more one uses and understands a communication medium, such as e-mail, the less associated difficulties they will experience in usage.

In broad terms, correlational analyses indicated that the number of years as a computer user and number of years as an e-mail user were significantly and directly linked to participants' e-mail attitude in terms of their Affect, Behaviour, and Cognitions. The fact that number of years as a computer user and number of years as an e-mail user were correlated has certain intuitive appeal as it tends to indicate that e-mail attitude matures and increases as time and exposure with the medium increases.

The only exception to this general observation was the lack of relationship between years of e-mail use and the behavioural e-mail attitude component. This lack of relationship is puzzling and requires further investigation into attitudinal weightings as broadly suggested by Eiser & van der Pligt (1988) and Henerson et al. (1987). This finding tends to imply that a user's ability to compare e-mail with other communication methods is not directly related to their exposure and experience with the communication medium.

Further to this, the lack of a direct relationship between typing speed and the behavioural e-mail attitude component also requires further investigation into attitudinal weightings (Eiser & van der Pligt, 1988; Triandis, 1971). It seems that typing speed does not influence one's opinion in their ability to use e-mail compared with other communication forms. This lack of result is especially puzzling given that both the Affective and Cognitive e-mail attitude components were linked to typing speed.

E-mail usage within the university setting

The results indicate that this cross section of New Zealand university staff members have a moderate level of e-mail usage which was on average 9.9 e-mails sent per day. When the descriptive statistics for the present sample were compared with Minsky and Marin's (1999) study using American academics, no significant differences in levels of usage were found. Mantovani (1994) underscored that e-mail usage is highly contextual by further developing Fulk and Boyd's (1991) observation of organisational policies defining and constraining appropriate e-mail use and communication in general. The absence of significant difference in levels of usage between these samples perhaps signalling e-mail usage is not as contextual as previously suggested by Mantovani (1994) and Fulk and Boyd (1991).

The present study found the most common use for e-mail within the university setting is for administrative purposes which was consistent with Ku's (1996) observation that e-mail usage within university settings was not primarily socioemotional due to the nature and purpose of the organisation. This primary use of e-mail within the Massey University sample was different from Stirton's (1995) research which found that the primary use of e-mail was research based activity, such as dialogue between geographically dispersed academics and researchers. Research was ranked the second most common reason for use just ahead of teaching purposes, and social purposes. The ranking of social purposes as the lowest reason for e-mail use is interesting and not necessarily positive as it could signal the presence of impression management (Anastasi & Urbina, 1997) or the absence of Komsky's (1991) 'critical mass' that is needed to make the medium a successful communication tool in an organisation. Currently the primary uses of e-mail at Massey University, such as research, only apply to select sections of staff and the organisation highlighting that e-mail might not be the most effective method of administrative communication and a

potential erroneous use of the medium which over time could lead to frustration, and less usage. The reordering of e-mail use priorities in the 5 years between e-mail related research efforts at Massey University also affirms Rice and Case's (1983) observation of e-mail use changing as individuals and the organisation grow into the communication medium and through experience understand its associated strengths and weaknesses.

E-mail usage and key demographics

Because Minsky and Marin (1999) did not report demographic data, the researcher was unable to compare the relationships of demographics to e-mail usage with their data. Results of this research indicate that e-mail usage at Massey University (Albany & Palmerston North) was not significantly influenced by participants' gender or location.

However, e-mail usage was found to be influenced by participants' position within the university, as academics recorded significantly higher levels of e-mail use than general staff. Perhaps this finding could be logically explained by academics using e-mail for teaching and research purposes that are simply 'non-applicable' to the majority of general staff members. This could be partially fuelled by an increasingly common thrust within e-mail based literature to highlight ways academics and lecturers can incorporate e-mail into their teaching styles and courses (Ballance & Rogers, 1991).

Further to this, significant differences were noted between age and e-mail use. The e-mail usage of university staff members less than 30 years of age was higher than university staff aged 30 plus years, again potentially resulting from an increased comfort, and an awareness of strengths and weaknesses of the communication medium, as well as reduced responsibilities as previously discussed in relation to e-mail attitude and key demographics.

Correlational analyses revealed that e-mail usage, as intuitively expected, was directly associated to the number of years as a computer user and the number of years as an e-mail user. E-mail usage increased as familiarity and ability to use computers in general, and more specifically, e-mail improved. Further to this, typing speed was weakly and directly related to e-mail usage indicating that typing speed influences both e-mail attitude and usage.

The relationships between e-mail attitude and usage

I was unable to find previous research investigating the relationship between e-mail attitude, from the tricomponent perspective, and e-mail usage. In this study all three factors of the e-mail attitude scale were found to be directly and significantly related to e-mail usage. As expected the affective e-mail attitude component was most strongly correlated to e-mail usage, closely followed by the cognitive e-mail attitude component, confirming the previously discussed attitudinal weightings, and the notion that the more positively or highly a participant felt and thought about e-mail as a communication medium, the more likely they were to use e-mail for communication (Eagly & Chaiken, 1993; Hunter & Allen, 1992). This latter finding is also reflected in Minsky and Marin's (1999) observation of Social Influence Theories, or communication theories with an emotive component such as affect, largely replacing Rational Choice Theories, or 'objective' communication theories, to explain communication medium usage in organisations.

In contrast, the behavioural e-mail attitude component was the most weakly associated with e-mail usage drawing into question Harrison and Rainer's (1992) conclusion that individuals who owned a home computer were more likely to have a positive attitude and higher levels of usage. The ranking of the behavioural e-mail attitude component is interesting as it tends to suggest university staff do not necessarily use e-mail because they prefer it to other communication mediums, such as the telephone or face to face communication. Which in turn raises the question: Do university staff members primarily use e-mail because it is convenient or because it means staff do not have to physically or verbally interact with those whom they would prefer to avoid? Answering this question is outside the boundaries of this thesis, but it does provide an interesting research avenue for exploration in the future as literature in the field suggests this could very well be part of the reason for e-mail's popularity within organisations (c.f. Corich, 1998; Hunter & Allen, 1992).

Relationships between well-being scales

No research was found comparing the specific well-being scales used in this thesis with one another. The results of all well-being scales used here were significantly correlated with one another, providing evidence of concurrent validity, indicating that

they are all measuring the same construct - well-being. The GHQ subscales demonstrated direct relationship with each other and confirmed Goldberg and Williams (1988) association between the presence of physical strain and a lack of social coherence. Along a similar thread somatic symptom and social dysfunction both demonstrated an inverse relationship with general life satisfaction, confirming a person's physical state significantly impacts their overall sense of well-being and satisfaction (Goldberg & Williams, 1988).

Positive affect, which represents positive psychological functioning, demonstrated direct influence on general life satisfaction signalling that higher psychological functioning is linked to higher general life satisfaction. Further to this, several of Watson and Pennebaker's (1989) observations were confirmed during the course of this study; for example, the inverse relationship between physiological well-being and psychological functioning, and the direct relationship between physiological well-being and a lack of social coherence. This highlights that the overlap between psychological and physiological well-being can to be explained by negative affect (NA), as NA was correlated with both health complaints and physical symptoms, as previously observed by Danna and Griffin (1999), Watson and Pennebaker (1989), and Watson and Slack (1993).

Well-being and key demographics

Of the demographic variables investigated in the present study very few were related to the measures of well-being. Most of the correlations were very weak, which on the surface seems inconsistent with both well-being and stress literature that have repeatedly demonstrated defined relationships between these variables (Beehr, 1995; Fried et al., 1984; Weiss & Cropanzono, 1986).

Campus location, years of computer use, years of e-mail use, and gender were not significantly associated with any of the five measures of well-being. This was particularly surprising in relation to gender as four out of the five well-being scales have demonstrated gender based differences in previous research, some of which involved university staff members (Goldberg & Williams, 1988; Watson & Clark, 1994). Harrison and Rainer (1992) also reported that females had higher levels of health related problems from computer usage than males. The results of the present study did suggest physical strain or somatic symptom decreased significantly with age, as participants

aged 50 plus had significantly lower somatic symptom scores than those participants under 50 years of age, a result that seems to defy the effects of natural aging.

Further to this, position within the university impacted on level of positive affect, as positive affect scores were significantly higher for academic than for general staff members. This result is understandable given that the ongoing repositioning, which is a euphemism for restructuring, at the time of the research was perceived as affecting general staff members, more than, academics (D. Clarke, personal communication, 19th September 2000).

Typing speed was found to be inversely associated with negative affect, and directly with positive affect and general life satisfaction suggesting that staff members who can type proficiently were less likely to experience distress and nervousness, and perhaps more likely to socially interact with others by e-mail for support, demonstrating the Physical Environment Indicator 'opportunity for social interaction' (Warr, 1987), as well as the ability to cope and respond to work demands.

Levels of well-being within the university setting

In general participants from Massey University demonstrated moderately high levels of well-being or 'wellness' according to the World Health Organisations conceptualisation of well-being (Christopher, 1999). Overall staff reported low levels of somatic symptom, social dysfunction, and negative affect as well as moderately high levels of general life satisfaction and positive affect. This is remarkable given the potential stress that could have been brought about by the repositioning. For example, the repositioning could have adversely impacted the staff's 'opportunity for control' which Warr (1987) considers the foundation of mental health.

Comparison groups were not available for the General Life Satisfaction Scale or the subscales of the GHQ (somatic symptom and social dysfunction); however, they were available for the PANAS subscales. The level of positive affect for staff at Massey University in this study was found to be significantly higher than a comparable American sample of university staff members. This finding suggests that Massey University staff members were more active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong. Conversely, the level of negative affect for staff of Massey University was found to be significantly lower than the sample of American university staff members, suggesting that the American university staff

members were more afraid, scared, nervous, jittery, irritable, hostile, guilty, ashamed, upset, and distressed.

Purportedly, the results with PANAS subscales suggest the Massey University staff have high levels of well-being. However, if one was to step back and look at the organisational climate when the questionnaire was unintentionally conducted the results may signal that many within Massey University thought there was a hidden, sinister purpose to this questionnaire and answered accordingly by 'faking good' or choosing answers that create a favourable impression (Anastasi & Urbina, 1997). For example, the following unsolicited statements were written on returned questionaries:

'I have one question - whose idea was this survey? Was it commissioned by the VC or some other AVC committee?' (Respondent 54).

'Massey is going through repositioning, which is making me worried about my job, and pretty angry too' (Respondent 358).

Relationships between e-mail attitude and well-being

No measure of well-being was significantly correlated to all three components of e-mail attitude or vice versa. Further to this, the results of this survey did not highlight e-mail attitude as negatively impacting well-being as previously thought in the literature (Carlson & Zmud, 1999; Hunter & Allen, 1992). The affective e-mail attitude component was directly related to PANAS positive affect. Both scales measure 'feelings' so that the relationship may reflect the concurrent validity of these scales rather than relationship (Anastasi & Urbina, 1997). The behavioural e-mail attitude component, on the other hand, was inversely linked to somatic symptom and negative affect, indicating that participants who had low behavioural scores or preferences for communicating using e-mail were more likely to experience physical strain, be irritable, hostile, and upset. The strength of these relationships was further demonstrated in the hierarchical multiple regressions as only general efficacy partly mediated the relationship between PA and affective attitude component, and the NA and behavioural attitude component.

In comparison, the behavioural e-mail attitude component was directly linked to general life satisfaction perhaps indicating there are benefits for the individual associated with e-mail communication. Participants who ranked e-mail more favourably, compared to other communication methods, were more likely to be happy with their life in general. On the other hand, the relationship could simply reflect the presence of a response set (Anastasi & Urbina, 1997). However, the relationship between general life satisfaction and the behavioural e-mail attitude component was not as strong as the relationships between PA and the affective e-mail attitude, and NA and behaviour e-mail attitude. In the former case general self-efficacy completely mediated the relationship between the behavioural e-mail attitude component and general life satisfaction. Finally, the cognitive e-mail attitude factor, which was reverse scored, was directly associated with somatic symptom which could be interpreted as the less somatic complaints and strains an individual has the stronger and more positive their thoughts of e-mail will be.

Relationships between efficacy measures

There was very limited existing research to compare the results of the efficacy measures to, partly due to the e-mail efficacy scale being specifically adapted for the purpose of this research. All measures of efficacy (general, computer, and e-mail) were found to be positively related to each other, once again providing some evidence of concurrent validity for these scales. The direct relationship suggests as belief and ability to perform a specific task increases overall opinion and belief in oneself to perform tasks in general also increases. This relationship reflects and confirms dominant thought in the efficacy field (Maddux, 1995; Sherer et al., 1982; Stanley & Murphy, 1996) and adds further weight to the value of measures of general efficacy as opposed to Bandura's (1986) notion of specific efficacy measures.

In particular, the relationship between computer and e-mail efficacy was so strong that it was concluded that computer and e-mail efficacy were confounded. In reflection I believe there are several factors which may have contributed to this scenario. The positioning of the scales directly following each other in the questionnaire may have caused response sets and biases, with acquiescence or the tendency to respond 'yes' (Anastasi & Urbina, 1997). The number of 'yes' responses was very high for both the computer and e-mail efficacy subscales as was a high Likert rating. This may

suggest that the sample of university staff members did not clearly differentiate between computer and e-mail related functions. For example, the following unsolicited statements were written on returned questionaries:

'I am stuck on answering these, as I do not see the fundamental distinction between software applications and e-mail applications' (Respondent 41).

Under the prompt change from software application to e-mail application: *'preanswered should be on previous page. Or is this the real test?'* (Respondent 127).

'I don't understand these questions. I think that the answers are the same as on the previous page' (Respondent 102).

Further to this, because the specific efficacy measures preceded each other, it caused some respondents to simply not fill out the e-mail efficacy measure which was the latter of the two measures (refer to Appendix B). If this research were to be repeated it may be helpful to separate the specific efficacy scales within the questionnaire to avoid this confusion.

Efficacy and key demographics

Location and position did not influence participants efficacy in this study. General efficacy was only significantly correlated to typing speed, suggesting that one's overall opinion of their ability to perform tasks impacts on specific tasks such as typing but not tasks such as e-mail usage when there is a more appropriate measures, such as the e-mail self-efficacy scale present. This finding is concurrent with Sherer et al.'s (1982) original conceptualisation of the notion of general efficacy and their general efficacy subscale.

Interestingly, computer efficacy was not correlated significantly to typing speed highlighting one's opinion of their ability to use a computer is not linked to their ability to type, rather, linked to their ability to perform the associated functions. In comparison, e-mail efficacy was significantly related to typing speed, suggesting that ability to type influenced opinion and ability to use e-mail. Possibly a difference in very specific e-mail efficacy being related to typing speed as opposed to computer efficacy is linked to

the nature of the task and the perceived time frame it involves; for example, e-mail is largely viewed as an 'instant' communication medium therefore perhaps 'speed' or typing ability is classed as more important than in computer use which, in general, is more related to a document nature and longer time frames.

Further to this, age was negatively correlated with both computer and e-mail efficacy, indicating that older participants (50 plus years) had significantly lower levels of efficacy or belief in themselves in relation to these functions. This is possibly due to less experience with e-mail and/or computers, a lowered ability to adapt confidently to change or perhaps as previously highlighted, related to responsibility and availability of time to become more confident with the mediums involved. It makes intuitive sense that the number of years of computer and e-mail use were both directly correlated with computer and e-mail efficacy as the implication of this relationship is an increased experience and feedback influences one's belief in their ability to perform tasks (Maddux, 1995). Interestingly computer and e-mail efficacy were also directly associated with gender, highlighting that females had significantly lower levels of 'technology related' efficacy than their male counterparts, despite females having higher levels of general self-efficacy than males.

Levels of efficacy within the university setting

Overall university staff members can be characterised as having a high level of general efficacy but only moderate levels of computer and e-mail related efficacy. The high level of general efficacy at Massey University could be attributed to the presence of many high and continuous achievers within the sample. For example, academic staff with multiple postgraduate and professional qualifications. Academic pride may partially explain why university staff had only moderate levels of computer and e-mail efficacy. They may not want to display their lack of knowledge for simple tasks or attend training sessions which were available and in which they may betray their lack of knowledge. Alternatively because computer and e-mail use is generally classed as an individual and isolated activity there was a lack of opportunity for seeing others work on computers and learning vicariously in accordance with self-efficacy theory (Bandura, 1986). Or finally, it may be the computers at Massey University are old, slow, and frequently breaking down and the staff are unable to separate technical failure from failure of self, thus negatively impacting their belief in themselves to successfully

perform computer and e-mail related tasks (D. Clarke, personal communication, 19th September 2000).

Given the organisational climate in which this research was conducted, the repositioning of the university and the potential for redundancies, it is surprising that staff responded significantly lower to the computer efficacy scale than their American counterparts (Minsky & Marin, 1999) who were under no such conditions. It has been already previously expressed in this discussion a logical thought would have been for staff to show 'no weakness', and upmost confidence in their perceive ability to perform tasks. Because at other points of the questionnaire it appeared that participants thought the questionnaire had a hidden or dual purpose which was in some way related to the repositioning.

Relationships between efficacy and well-being

General efficacy was significantly correlated to all but one measure of well-being - somatic symptom. However, it is noted that somatic symptom failed to demonstrate significant relationships with any of the efficacies. This finding is surprising as a logical line of reasoning would have been that perceiving one's lack of ability to perform tasks either in general, or more specifically, would have been associated with physical strain and stress for the individual. General efficacy was inversely linked to social dysfunction and negative affect, indicating that the higher one's social coherence and functioning the higher their perceptions of their capabilities. On the other hand, general efficacy was directly related to positive affect and general life satisfaction, indicating high levels of general efficacy positively influence psychological functioning and well-being.

Computer efficacy, was also negatively associated with social dysfunction and negative affect, and positively associated to positive affect. Computer efficacy failed to demonstrate a significant relationship to general life satisfaction underscoring as the literature suggests, specific efficacies serve specific purposes (Bandura, 1996; Bandura, 1997; Maddux, 1995; Sherer et al., 1982). In addition e-mail efficacy, the most specific form of efficacy in this study, was related to the least number of measures of well-being. E-mail efficacy only demonstrated significant relationship with the PANAS subscales, suggesting that e-mail efficacy was related to well-being on a purely emotive level.

Self-efficacy is a key element of social cognitive theory which believes that individuals are in continuous reciprocal interaction with their cognitions, behaviour, and environment (Bandura, 1986; Compeau et al., 1999). Hierarchical regressions revealed in broad brushstrokes general efficacy mediated the relationship between different attitude and well-being components. More specifically general efficacy partially mediated the relationship between the affective e-mail attitude component and positive affect, and the relationship between the behavioural e-mail attitude component and negative affect, indicating that a person's level of psychological functioning is partly influenced by their feelings and actions as well as the sum of their perceptions and beliefs in themselves and their ability to successfully complete a variety of tasks, rather than, more specific tasks. Further to this, general efficacy completely mediated the relationship between the behavioural e-mail attitude component and general life satisfaction. When interpreted, this finding conceptualises behaviour and action influencing general life satisfaction through one's level of general efficacy.

These results are important on both theoretical and practical levels. On a theoretical level, this study highlights the importance of general efficacy and affirms it as a construct deserving further research attention. On a practical level, these results highlight the importance of the holistic person as suggested by Warr (1987), rather than, the compartmentalisation of a person into work and private life as commonly conceptualised. Further to this, these regressions demonstrate the importance and influence of one's generalised sense of self in relation to well-being, rather than, simply specific abilities which in the work environment provides valuable information for those responsible for training and development as it widens the scope of development from purely work related skills to potentially life skills.

Limitations

In interpreting the results of the present study some general caveats need to be taken into account as the findings are limited by several factors. Firstly, complete data were not available for all variables, and although missing variables were addressed, the results and subsequent analyses may be affected, especially if the missing values were systematically different in some way which was not detected. Because of the response

rate results may not be representative of the Massey staff or larger group of university staff within New Zealand.

The positioning of the specific efficacy scales has already been highlighted in this chapter as a concern and potential limitation of the study as it may have to caused acquiescence; therefore, the results related to these measures should be treated and interpreted with caution. Further to this, as this study is largely exploratory and correlational, no causal inferences can be drawn from the relationships described in this study. Also, as the sample was university-based, results and findings can not be generalised to the corporate or organisational environment.

A further possible limitation of this study was the use of self-report measures. Although there are clear problems associated with using self-report measures, such as confounding because of common method variance (Tabachnick & Fiddell, 1989), in this instance use of self-report measures allowed for a number of relevant variables to be measured quite efficiently. The length of the questionnaire could also be a limitation of this study. Because of its length, questions, and scales placed at the end suffered from a lower response rate. Further to this, as it was fairly lengthy and involved some prospective respondents may have been put off completing it; for example:

'I'm waiting for the version that takes 20 minutes to complete rather than read!' (Respondent 560.)

'Can I say that this is a rather long and complex survey which will not encourage people to complete it. Took me two attempts to finish' (Respondent 558)

A tangible limitation to this study was the untimely announcement of the restructuring at Massey University, as it appeared to create great distrust and scepticism in relation to the research, potentially influencing responses and response rates as previously highlighted where appropriate throughout the course of this thesis.

The sample of university staff used may also have created a further possible limitation. The sample may not be representative of university staff as a whole because the sample was loosely divided into general and academic, therefore, some of the 'colour' and differences between staff members who fall under the umbrella of general staff may have been lost. In addition, overall the sample can be considered very well

educated with approximately half of the respondents being academics or researchers. There is the possibility of desirability and response sets, such as with the specific efficacy scales on which participants may have tried to demonstrate their academic prowess with information technology.

The e-mail efficacy scale and well-being scales may have been a limitation in themselves because they may not have been sensitive enough to detect efficacy and well-being related issues with this group, for example the skewness of scores. Future research with New Zealand university staff members would have to consider this and perhaps utilise other measures to test this notion.

Because the primary focus of this research was exploratory and because there were no previous models linking the effects of e-mail attitude and well-being additional analyses, such as path analysis, were beyond the scope of the present study. Finally, the last limitation of the present study was the omission of open-ended data collection techniques. The inclusion of open-ended questions, for example, may have provided different insight into the attitude, efficacy, and well-being issues of university staff members, as the unsolicited comments written on the questionaries provided some indication of the issues involved.

Recommendations and directions for future research

The key recommendation of this research is that research should be repeated with New Zealand samples, focusing in on ethnic and job differences, to assess if the differences in results across the present New Zealand sample and limited previous American samples are genuine differences which are specific to New Zealand university staff members. It may be that different political and cultural groups treat information technology media differently.

Further to this, it is recommended that more research be conducted with a cross section of university staff members in general to assess attitude, efficacy, and well-being issues but using differing methods to the present study, for example, instead of using subscales of the GHQ-28, use all of the GHQ-28. This recommendation is made in light of the fact that the sample in the present study did not appear to have extreme issues pertaining to well-being as a result of e-mail attitude and efficacy as signalled in literature and by the popular media (Danna & Griffin, 1999). It is important to

determine whether these differences are unique to this sample or reflective of university staff in general. Utilisation of different research methods such as open-ended data collection techniques may be more sensitive to detecting the issues of this population. In addition, it is recommended that the relationship between the presence of physical strain and social coherence be investigated further to determine potential predictors.

Future research also needs to assess 'general' university staff members in greater detail and perhaps further break down this category into subcategories such as secretary, research assistant, and laboratory technician to provide more insight into the unique responsibilities and pressures of each type of role.

The fact that previous research has not commonly considered attitude from the tricomponent perspective is interesting given the additional information this perspective provides. One would have thought this would have led researchers to consider, as the present study has, the partialing of the three components of an attitude. Future research would benefit from extending attitudinal research in this area, and looking at how individuals 'weight' affect, behaviour, and cognitions. A specific example would be further developing the e-mail attitude scale, in particular the behaviour and cognitive components which each consisted of two items and conducting further validation studies using this scale. The relationships between tricomponent attitudinal theory and personality variables outlined in Ajzen (1988) could be investigated. Further to this, Compeau and Higgins (1995b) belief, that differences in computer efficacy are linked to personality, also warrants investigation.

With regard to e-mail use, it would also be interesting to examine more carefully why university staff use e-mail, for example, whether it is to hide physically or verbally from certain others? Although, this has not been explored in prior research, the literature purports 'convenience' (Hunter & Allen, 1992) as a dominant reason for use, making this an appropriate channel for expansion.

Chapter Eight: Conclusions

Despite the previously discussed limitations of the present study it is believed that this research the most comprehensive investigation assessing variables pertaining to university staff member's attitude towards e-mail, their levels of general, computer, and e-mail efficacy, and how this impacts their well-being to date. This is especially so within New Zealand where research on university staff and each of the variables is very limited. A great strength of this study is that it appears to be the first effort to assess, in a theoretically integrated manner, e-mail attitude, how it impacts on well-being, and the role of efficacy within this relationship.

Certainly the findings are constrained by the sample, measures, analyses conducted, and the research design used. However, regardless of this from both a theoretical and practical perspective the results of this study have implications for university staff members. Certain inferences can be made in relation to e-mail attitude, levels of efficacy, and levels of well-being.

It appears that university staff in the present study have a moderately positive attitude towards e-mail that is weighted fairly consistently with existing tricomponent attitude literature. Despite evidence of low levels of well-being as a result of e-mail in the workplace as suggested in literature and the popular media, this study found that Massey University staff members, on the whole, may not have the same issues as corporate workers, as their overall level of well-being was moderately high despite organisational repositioning. Further to this, minimal variation was found between New Zealand university staff members and their levels of e-mail usage when compared to an American sample. Significant differences were found between Massey University staff on computer efficacy and PANAS subscale scores when compared to existing research, and between key constructs and key demographics.

The present sample demonstrated a high level of general efficacy but only moderate levels of computer and e-mail related efficacy. Regressional analyses concluded that general efficacy partially mediated the relationship between the affective e-mail attitude component and positive affect, and the behavioural e-mail attitude component and negative affect. Further to this, general efficacy completely mediated the relationship between the behavioural e-mail attitude component and general life

satisfaction. When interpreted in broad terms these results highlight a person's level of psychological functioning is influenced by their feelings and actions as well as the sum of their perceptions and beliefs in themselves and their ability to successfully complete a variety of tasks, which has implications for those in positions of responsibility within organisations.

A key difference between previous research and the present study, pertains to the composition of the sample used, for example, this sample consisted of a cross section of university staff including academic and general staff members. This may have contributed to the differences emerging in the present study in comparison to previous research, as analysing a cross section of university staff is not common.

Overall the results of the present study differ from available, existing literature, providing many avenues for further exploration as highlighted in the discussion. Although it is possible that New Zealand university staff members face different issues to American university staff members, it may be that New Zealand university staff members are no different from other university staff members. As the most recent piece of research conducted using university staff as a sample, these results may be reflecting changes in regards to the status of e-mail attitude, efficacy, and well-being.

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Appendix A: Pilot Questionnaire

1. Do you feel e-mail is central to functioning in your role?

2. How do you feel e-mail has impacted on your daily work activities?

3. In your experience what are the advantages of using e-mail?

4. In your experience what are the disadvantages of using e-mail?

5. Have you received training and support in 'how' and 'when' to use e-mail?

6. Comment on e-mail as a function for: admin, research, teaching, and social functioning?

7. Which other communication method do you believe e-mail has replaced?

Appendix B: Information Sheet & Questionnaire

Massey University
COLLEGE OF HUMANITIES & SOCIAL SCIENCES

School of Psychology
Private Bag 102 904,
North Shore Mail Centre,
Auckland,
New Zealand
Telephone: 64 9 443 9863
Facsimile: 64 9 443 9732

A study of the impact of e-mail on staff & their relationships to work.

INFORMATION SHEET

Dear Massey University staff member,

You are invited to take part in a questionnaire which explores attitudes towards e-mail and how one's computer-based and generalised opinions of one's capabilities influence well-being and attitudes related to work.

This research is being carried out by masterate theses students based at Massey University (Albany), Evana Selak and Lynette Marchant. Evana and Lynette are under the supervision of Dr Hillary Bennett from the School of Psychology, Massey University (Albany).

All staff members regardless of discipline and position have been invited to participate in this research to obtain a more complete picture. All questionnaires are anonymous and confidential. You will not be required to give your name, any form of identification or code when completing the questionnaire, and you will not be able to be specifically identified by any information obtained by the questionnaire.

Participation in the research is voluntary, with participants having the right to:

- choose not to answer any question(s);
- withdraw from the study at any point until the questionnaire is returned to the researchers;
- contact the researchers for clarification of questions;
- be given access to summary findings upon conclusion of the study.

This research has approval from the Massey University Human Ethics Committee (Albany). If you have any ethical concerns please contact the chairperson of this committee, Mike O'Brien on 443-9799 extension 9768.

Key findings from this study will be fed back to the University and could be used to help develop appropriate interventions, for example, training opportunities or policy amendments. Key findings will also be fed back to the participants via the 'Massey News' publication. However, participants or interested parties will not be able to gain access to their individual profiles due to the anonymous nature of the research. It is intended that the findings be published in an appropriate academic journal in the future.

By choosing to take part in the research you will be asked to complete the following questionnaire, which consists of various scales and demographic questions, taking approximately 20 minutes to complete. Please send the completed questionnaire back to the researchers via Massey University's internal mail system in the addressed envelope provided by the **29th May 2000**.

If at any time you would like to know more information about the research or have any questions concerning the research, please feel free to contact Dr Hillary Bennett on 443-9799 extension 9864. If the nature of this research raises any personal issues that you would like to talk about an alternative contact is the health and counselling centre on 443-9799 Albany extension 9783 or Palmerston North extension 7543 who will be able to direct you towards further, more appropriate assistance.

A study of the impact of e-mail on staff
&
their relationship to work

Instructions

Thank you for participating in this voluntary study, please remember, you have the right to decline to answer any particular question.

The questionnaire is in 7 sections. It is estimated that the questionnaire will take approximately 20 minutes to complete. It is assumed that filling in the questionnaire implies consent. For the purpose of this study, e-mail is defined as communication sent between individuals, groups, or organisations using computer technology.

There are no right or wrong answers. Answer honestly and state your opinions as accurately as possible. Upon completion please return the questionnaire to the researchers in the addressed envelope provided via the **Massey University Internal Mail System**, by the **29th May 2000.**

If you withdraw from the study please feel free to return the uncompleted questionnaire to the researchers also in the envelope provided. As a participant you have the right to withdraw from this research at any point until the questionnaire is returned to the researchers.

This is an anonymous questionnaire and responses can not be traced. Please do not put your name on the questionnaire. All information will remain confidential.

Thank you again for your time and participation.

Section A: E-mail usage & opinions

In the left hand column please indicate by using the following scale, how often you use your e-mail system for the listed activities:

1	2	3	4	5
Never	**Seldom**	**Sometimes**	**Often**	**Always**

In the right hand column please indicate by using the following scale, how satisfied you are with your e-mail system for the listed activities:

1	2	3	4	5
Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied

USEAGE		SATISFACTION
___	... to exchange routine information with others	___
___	... to schedule meetings	___
___	... to coordinate project activities	___
___	... to share opinions	___
___	... to resolve conflicts/disagreements	___
___	... to negotiate	___
___	... to get to know someone	___
___	... to keep in touch with someone in another location	___
___	... to send notes that contain sociable or non-work related content	___

Please respond to the following statements about your e-mail system:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I like using e-mail.	1	2	3	4	5
E-mail is an efficient method of communication.	1	2	3	4	5
E-mail is a convenient method of communication.	1	2	3	4	5
I prefer using e-mail to the telephone.	1	2	3	4	5
I prefer using e-mail to face-to-face communication.	1	2	3	4	5
Most of my e-mail is important.	1	2	3	4	5
I have access to more information by using e-mail.	1	2	3	4	5
I have had difficulty sending e-mail messages.	1	2	3	4	5
I have had difficulty editing e-mail messages.	1	2	3	4	5
E-mail helps me in my position.	1	2	3	4	5

	NO										
... if I had used similar packages before this one to do the same job.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										

The following set of questions look similar to the previous set of questions but please note the change in context. For the following questions imagine that you were given a new e-mail application for some aspect of your work.

I COULD COMPLETE THE JOB USING **THE E-MAIL APPLICATION...**

		Not at all confident				moderately confident				totally confident	
... if there was no one around to tell me what to do as I go.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I had never used a package like it before.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I had only the e-mail manuals for reference.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I had seen someone else using it before trying it myself.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I could call someone if I got stuck.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if someone else had helped me get started.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I had a lot of time to complete the job for which the e-mail was provided.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
...if I had just the built-in help facility for assistance.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if someone showed me how to do it first.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										
... if I had used similar packages before this one to do the same job.	YES...	1	2	3	4	5	6	7	8	9	10
	NO										

Section C: Work Relationships.

Please respond to the statements in this section to reflect your views about your relationships with others at work:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My colleagues and I are friends as well as co-workers.	1	2	3	4	5
My colleagues and I frequently listen to each other's personal problems.	1	2	3	4	5
My colleagues and I share confidences with each other.	1	2	3	4	5
My colleagues and I frequently exchange constructive criticism.	1	2	3	4	5
My colleagues and I assist each other in accomplishing assigned tasks.	1	2	3	4	5
My colleagues and I frequently exchange compliments and positive evaluations.	1	2	3	4	5
I work jointly on major projects or cases with my colleagues.	1	2	3	4	5
I frequently exchange ideas with my colleagues.	1	2	3	4	5

In general how satisfied are you with the relationships you have with your colleagues? Please circle your response.

1	2	3	4	5
Very satisfied	**Satisfied**	**Neither satisfied nor dissatisfied**	**Dissatisfied**	**Very dissatisfied**

Section D: Well-being

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during ***the past few weeks.*** Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	**a little**	**moderately**	**quite a bit**	**extremely**

___ interested	___ irritable	___ upset	___ inspired
___ distressed	___ alert	___ strong	___ nervous
___ excited	___ ashamed	___ guilty	___ determined
___ scared	___ attentive	___ hostile	___ jittery
___ enthusiastic	___ active	___ proud	___ afraid

How satisfied or dissatisfied are you with your life as a whole?
Circle the number which comes closest to how satisfied or dissatisfied you feel?

1	2	3	4	5	6	7
completely dissatisfied						**completely satisfied**

Section E: Communication.

Please indicate how satisfied you are with e-mail as a tool of communication in each of the following areas:

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
communication within your immediate work environment	1	2	3	4	5
communication within your college	1	2	3	4	5
communication within this university	1	2	3	4	5
communication with external sources	1	2	3	4	5

Overall, how satisfied are you with e-mail as a means of communication. Please circle your response.

1	2	3	4	5
Very satisfied	**Satisfied**	**Neither satisfied nor dissatisfied**	**Dissatisfied**	**Very dissatisfied**

The following are statements related to communication within the university. Please indicate how much you agree with each statement:

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I receive all the information I need to carry out my work.	1	2	3	4	5
People in this university do not spend too much time on unessentials.	1	2	3	4	5
I am kept adequately informed about significant issues in this university as a whole.	1	2	3	4	5
I am kept appropriately informed by the grapevine and other informal means.	1	2	3	4	5
My department works well with other departments.	1	2	3	4	5
My department receives all the information it needs to carry out its function well.	1	2	3	4	5
My department is kept adequately informed about significant issues in this university as a whole.	1	2	3	4	5
I understand clearly how I can contribute to the general goals of this university.	1	2	3	4	5
I have adequate opportunities to express my views in my department.	1	2	3	4	5
My colleagues are generally eager to discuss work matters with me.	1	2	3	4	5
In general communication is effective in this university.	1	2	3	4	5
I work effectively because other employees communicate regularly with me.	1	2	3	4	5

One of the major reasons I continue to work for this university is that leaving would require considerable personal sacrifice; another organisation may not match the overall benefits I have here.	1	2	3	4	5	6	7
I owe a great deal to this university.	1	2	3	4	5	6	7
If I had not already put so much of myself into this university, I might consider working elsewhere.	1	2	3	4	5	6	7

Section G: Demographic questions

Please answer the following questions by ticking the appropriate box or indicating the appropriate numerical value.

Gender: Male ☐ Female ☐

Age: ☐ less than 30 ☐ 30 to 49 ☐ 50 plus

Campus: Albany ☐ Palmerston North ☐

College: Humanities/Social Sciences ☐ Sciences ☐ Other ☐

Business ☐ Education ☐

Position: Academic staff ☐ General staff ☐

If you responded 'academic' to the previous question:

- are you currently teaching: yes ☐ no ☐
- and if so is it: internal ☐ extramural ☐ block mode ☐

Number of years worked for this university:
☐ less than 1 year ☐ 1 to 5 years ☐ 5 to 10 years ☐ more than 10 years

Number of years as a computer user: __ years

Number of years as an e-mail user: __ years

Average number of e-mails sent per day: __

Please estimate out of 100% in total, how much of your e-mail time is spent in each of the following functions:

___ Research

___ Social function

___ Administration

___ Teaching related functions
100%

Estimated typing ability in words per minute:
10 words ☐ 20 words ☐ 30 words ☐ 40 words ☐ 50 plus words ☐

Method that your computer notifies you of mail:
☐ Beeps ☐ Picture ☐ Doesn't notify me

Appendix C: Factor Matrixes For E-mail Attitude Scale

Initial Factor Analysis

Item	Factor 1 (Affect)	Factor 2 (Behaviour)	Factor 3 (Cognitions)	Communality
'E-mail is an efficient method of communication' (item 2)	**.71**	-.07	-.07	.49
'E-mail is a convenient method of communication' (item 3)	**.70**	-.11	-.06	.49
'I like using e-mail' (item 1)	**.67**	-.07	.02	.38
'I prefer using e-mail to the telephone' (item 4)	**.60**	-.19	.49	.38
'E-mail helps me in my position' (item 10)	**.57**	-.14	-.37	.32
'I have access to more information by using e-mail' (item 7)	**.51**	-.11	-.19	.27
'I prefer using e-mail to face-to-face communication' (item 5)	**.44**	-.19	.38	.29
'Most of my e-mail is important' (item 6)	**.39**	-.09	-.24	.19
'I have difficulty sending e-mail messages' (item 8)	.41	**.85**	.08	.43
'I have difficulty editing e-mail messages' (item 9)	.35	**.58**	-.02	.43

Factor Matrix After VARIMAX Rotation

Item	Factor 1 (Affect)	Factor 2 (Behaviour)	Factor 3 (Cognitions)	Communality
'E-mail helps me in my position' (item 10)	**.69**	.06	.05	.48
'E-mail is an efficient method of communication' (item 2)	**.60**	.36	.17	.52
'E-mail is a convenient method of communication' (item 3)	**.60**	.38	.14	.51
'I have access to more information by using e-mail' (item 7)	**.53**	.16	.06	.31
'I like using e-mail' (item 1)	**.51**	.41	.17	.45
'Most of my e-mail is important' (item 6)	**.47**	.06	.03	.22
'I prefer using e-mail to the telephone' (item 4)	.20	**.78**	.06	.64
'I prefer using e-mail to face-to-face communication' (item 5)	.15	**.60**	.00	.37
'I have difficulty sending e-mail messages' (item 8)	.05	.07	**.94**	.89
'I have difficulty editing e-mail messages' (item 9)	.15	.03	**.66**	.46