Single Person Study:

Methodological Issues

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Declaration

This thesis is the sole work of the author and has not been submitted in substantially the same form the award of a higher degree elsewhere.

Abstract

This thesis is about a single person study and methodological issues surrounding it. The single subject study emerged as a result of an interesting use of mobile phone by a user. This person was then studied over a period of time. Initially, it was only a technique to study the mobile phone use. However, due to a prolonged study, the single person study gradually became important as methodological issues. This thesis highlights deep methodological reflection of the single person study: friendship and empathy. Friendship is developed due to similarities, gender, and personality. Empathy in this study is achieved through deep understanding of a friend. Friendship definitely affects the study both positively and negatively. Friendship yields more accurate and extensive data, helps a researcher empathise with a subject, and makes working atmosphere less stressful. Friendship, however, may pose threats to the validity of the study and delay the accomplishment of the study. Any disagreement in the project may also affect the friendship.

List of publications

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Chapter 1

This chapter highlights the following:

- Research motivation and background
- Overview of related studies in other academic areas
- Thesis statement and research objectives
- Overview of the thesis
- Language used in the thesis

Chapter 1

Introduction

1.1 Introduction

This thesis is about a single person study and methodological issues surrounding it. This chapter explains how my research, a single person study, began. This chapter also provides an overview of single subject studies in a number of areas including Human Computer Interaction (HCI), psychology, and science. Based on this overview of single subject studies, statements about the thesis are made and the research objective is set. The chapter concludes with an overview of the thesis.

1.2 Research Motivation

1.2.1 How it began

In a preliminary study of mobile phone use, I studied six mobile phone users. Table 1 summarises how the participants had used their mobile phones.

Table 1. Summary of Mobile Phone Use in Everyday Life

Participant[1]	Frequency of use[2]	Place most likely to use mobile phone	Activity with mobile phone (based on frequency)
P1 (Linguistic PhD student)	Several times a week	Home – but I bring it everywhere I go including to bedroom	• Set alarms • Text messages • Make phone calls • Update contacts • Take pictures
P2 (MSc IT student)	Several times a day	Wherever I am	• Make phone calls (off peak) • Text messages • Manage personal tasks • Download ringing tones
P3 (Accounting PhD student)	Several times a day	Wherever I am	• Make phone calls • Text messages • Make schedule • Check prayer time
P4 (Computing PhD student)	Use it if necessary	Only bring it if I need to use it	• Text messages • Make phone calls • Play games • Browse internet
P5 (Computing lecturer)	Several times a day	Wherever I am	• Make phone calls • Text messages • Take pictures • Access to calendar
P6 (Computing researcher)	Several times a day	Wherever I am	• Make phone calls • Check voice message • Text messages • Play games • Take pictures

P1 (from Table 1.1) used her mobile phone several times in a week, but used it more often as an alarm. When asked about frequency of use, she took this in terms of how often she made phone calls and sent text messages. This interested me, and so, I asked the other participants[3] about what they understood by 'frequency of use'. Intriguingly, they all gave similar answers.

P1 differed to the other participants in terms of how she used her mobile phone: she used it more often as an alarm. She said that the alarms were used as reminders,

[1] Participant is numbered based on their turn for the interviews. For example, P1 is the first participant to be interviewed, not the first who was identified for the study.
[2] Based on what they had reported in the interviews.
[3] I did not have a chance to ask the fifth participant (P5) because of time constraint during the interview session.

for example, to help her wake up in the morning and to remind her to pick up the kids from schools, go to the office and go home. Generally, she uses her mobile phone alarms to help remind her of her routine activities.

I found that having to rely on the alarms for routine activities very interesting. For me, I do not depend on other tools to help me carry out my routine activities because I do them all the time and they have been a part of my life. It is 'automatic' that I will carry out my routines without failure.

I also found it interesting that P1 used her mobile phone more often at home. It contradicted my earlier preconception on the use of mobile phone: I always thought that mobile phone would be used more often whilst out and about.

P1's use of her mobile phone differed to my own and to that of the other interviewees, and somehow this difference seemed to be casting a new light on 'normal' use – for example, it had already led me to see people talk about frequency of use only in terms of calling and texting.

For me, she would be an interesting subject to study. Studying her in particular would help me understand why she used her mobile phone the way she did it.

P1 is an example of an extreme user of the mobile phone alarm. Djajadiningrat, Graver, and Frens (2000) who studied extreme characters suggest that extreme characters can help explore how the interaction influences the relationship between the user and product and designing for extreme characters helps expose emotions and character traits which "remain hidden in scenarios for supposedly real-life characters because they are incorrect or embarrassing" (Djajadiningrat et al., 2000).

1.2.2 Related studies

This research investigates how a particular person (a woman) uses her mobile phone including its alarm at home.

Research related to women and use of IT is rather common in the field of science and technology. For example, Ruth Schwartz Cowan discusses the implications that technology has had on women both in the home and in the workforce outside of the home in her book, "More work for mother" (Cowan, 1985). Recently, HCI also focuses on the use of technology at home as discussed by Crabtree (2002 and 2003) and others (e.g., O'Brien et al., 1999; Hutchinson et al., 2003) at various HCI conferences.

The use of alarm as reminders is rather common in the everyday life and many studies on the alarm clock are done in HCI. Tolmie and his colleagues (2002), for example, studied the use of alarm clock to understand a person's domestic routines in 'Unremarkable Computing' (Tolmie et al., 2002). Meanwhile, Wensveen and Overbeeke (2003) designed an alarm clock based on emotion which is expressed through action in their study, 'Touch me, hit me and I know how you feel: a design approach to emotionally rich interaction'. Others who study alarm clocks include Landry et al. (2004) and Ozenc et al. (2007).

1.2.3 The Thesis

While studies related to women's use of alarm clocks and text messaging, and emotions are relevant to HCI, my thesis in particular is focused on doing a **single-person study** and **methodological issues** surrounding the study. The single-person study emerged as a result of an interesting use of a mobile phone by one particular

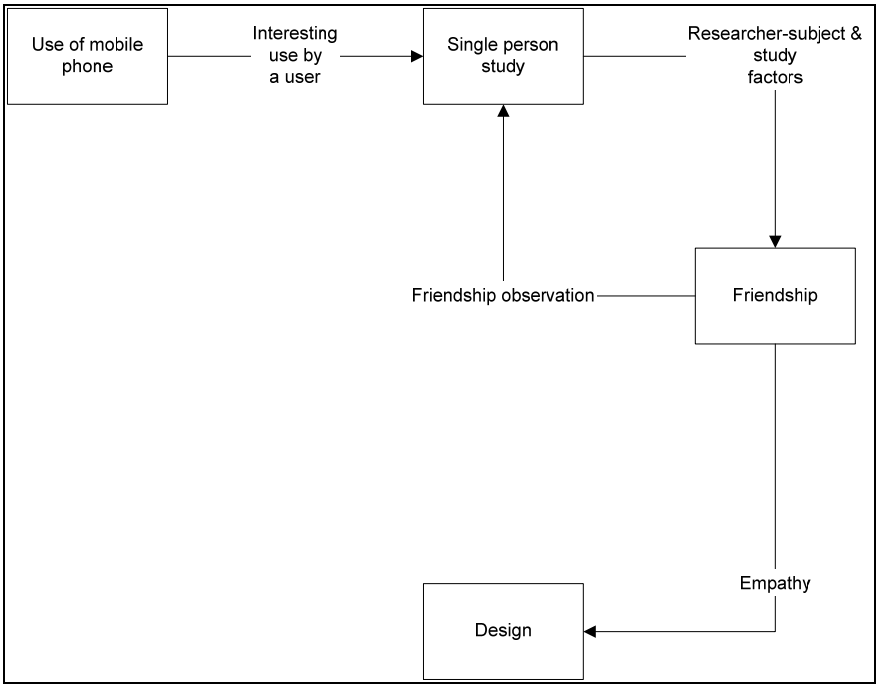
person. However, deep methodological reflection of the single person study happened later.

At the beginning, it appeared to me that single person study was only a technique. As I was doing the study, gradually I realised that it became important as a methodology. Studying this person over a period of time affected the relationship between myself and the subject: we become friends. In fact, it is my suspicion that many shades involve friendships between researcher and subject in one form or another. Therefore, rather than ignore or somehow try to overcome this issue, I wanted to explore it. HCI has for many years been dominated by 'objective' or 'scientific' methods, but I was wandering whether friendship and 'empathy' between friends could inspire design.

While friendship has the potential to provide benefits to design activities, it also raises some methodological issues that affect the research and design decisions.

Overview of the PhD work is illustrated in the diagram below.

Figure 1. Summary of the PhD work



1.3 Research Background

The previous study of six mobile phone users is an example of qualitative research work. However, when things are compared and contrasted among these six users, the interesting aspects of an individual can still be overlooked.

Since this research tries to understand why P1 becomes dependent on her mobile phone alarm, studying one particular person, therefore, seems relevant if we want to understand why certain things are important for her and perhaps for some other people.

While a one-person study represents an extreme form of qualitative work, it is rather a common form of doing research in certain areas of academic studies. This section provides overviews on the study of single subject. Since HCI has many roots in psychology, therefore, the discussion in this section begins with overview of single subject studies in psychology.

1.3.1 The single subject study in psychology

When psychology emerged as a new science during the 19th century, statistical analysis was still in its infancy. Behaviourists used the smallest N[4] possible: they studied their own behaviours or the behaviour of a single individual. Some of the pioneers in psychology who used a single individual in their studies include:

- Gustav Fechner (1860) investigated basic psychological methods which are still used today to measure sensory thresholds and discover principles of psychophysics. He worked extensively on his brother-in-law.

[4] The number of subject in a study.

- Charles Darwin (1877) studied child development, accomplished by keeping a detailed diary of his own son's childhood. It was published as "A Biographical Sketch of an Infant" in the journal *Mind*.

- Ebbinghaus (1885) studied memory by examining his own ability to learn and recall the lists of nonsense syllables.

Studying a single subject in Psychology can be done either using exploratory or experimental design method. Chapter 2 will discuss the differences between these two methods in more detail. Regardless of the technique, the main advantage of studying one subject is that the researchers are able to understand a specific problem deeply and this specific problem may not be highlighted if many subjects are studied at one time.

However, as quantitative psychology gained popularity, the use of single subject study was criticised. The main criticism is that this type of research is unscientific due to its approach and also has limited application which can only be used to similar cases. Nevertheless, applied psychology such as in clinical studies and counseling continue to adopt this technique because of the benefits that it gives to these studies.

This study is about understanding a person's use of mobile phone, therefore, exploratory method as applied in psychology seems more appropriate to this research.

1.3.2 The single subject study in Sociology

HCI also has some roots in sociology. Studying an individual case in sociology is often associated with case study research. Rather than using large samples and following a rigid protocol to examine a limited number of variables, case study

methods involve an in-depth, longitudinal examination of a single instance or event: a case. They provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results. As a result the researcher may gain a sharpened understanding of why the instance happened as it did, and what might become important to look at more extensively in future research. Case studies lend themselves to both generating and testing hypotheses (Flyvbjerg, 2006).

During the period leading up to 1935, several problems were raised by researchers in other fields. This coincided with a movement within sociology, to make it more scientific. This meant providing some quantitative measurements to the research design and analysis. In America, The Chicago School was most identified with case study methodology. In 1935, there was a public dispute between Columbia University professors, who were championing the scientific method, and The Chicago School and its supporters. There were serious attacks on the case studies. This resulted in the denigration of case study as a methodology. The outcome was a victory for Columbia University and the consequent decline in the use of case study as a research methodology.

As in Psychology, as the use of quantitative methods advanced, the decline of the case study hastened. However, in the 1960s, researchers were becoming concerned about the limitations of quantitative methods. Hence there was a renewed interest in the case study. Strauss and Glaser (1967) developed the concept of "grounded theory." These along with some well regarded studies accelerated the renewed use of the case study methodology, and have more recently become widely influential in HCI.

Case studies do not necessarily focus on one individual, but do allow for the uniqueness of individuals.

1.3.3 The single subject study in science

Generally, comparing many people and quantifying data in numbers are often thought to be more scientific. However, science is often done through performing careful observations.

In science, a single subject study is ideal for generalising the type of test that Karl Popper (1959) called 'falsification' which in social science forms part of critical reflexivity. Falsification is one of the most rigorous tests to which a scientific proposition can be subjected: If just one observation does not fit with the proposition, it is considered not valid generally and must therefore be either revised or rejected.

For example, Galileo's rejection of Aristotle's law of gravity was not based on observations 'across a wide range', and the observations were not 'carried out in some numbers'. The rejection consisted primarily of a conceptual experiment and later on of a practical one. Galileo reasoned as follows: If two objects with the same weight are released together from the same height at the same time, they will hit the ground simultaneously, having fallen at the same speed. If the two objects are then stuck together into one, this object will have double the weight and will, according to Aristotle, therefore fall faster than the two individual objects. Galileo determined that all objects regardless of weight and density would fall at the same rate in a vacuum. So he eliminated weight as a determinant factor for acceleration in free fall. He did only a single, careful observational experiment to reject the Aristotelian view.

1.3.4 The single subject study in computing

There are many studies that use or focus on a single subject in computing, particularly in HCI, software engineering, and artificial intelligence.

- Human-computer interaction (HCI)

User studies in HCI have been largely influenced by methods in Psychology. Studying one subject or person, therefore, is rather common in HCI and often done using a case study method for various design purposes.

In designing a system for a specific group of people, very often a single individual is studied. For example, Cole and Dehdashti (1990) and Paradise and her colleagues (2004) both studied a woman with traumatic brain injury to understand how a person with mild cognitive impairment copes with the everyday life. The empathetic understanding is highly needed for the design of an application system for individuals with similar conditions.

Studying an individual case as in a single piece of software is also done to understand specific design requirements or problems. For example, Hahn (2001) studies an online auction – eBay (http://www.ebay.com) – to understand how the design of such marketplace can affect how people browse and search for products at the individual level.

In addition, an individual case can be taught to students to provide them with some preliminary knowledge and skills before they can do a project on their own. Rosson and her colleagues (2004), for example, introduce an individual case study to the students at Virginia Tech 'just-in time' to support their semester long group projects.

In HCI, studying an individual case allows for understanding of things which might be important for an individual but which might not get highlighted if more individuals or cases are studied at one time. Although generalisation is often possible for other similar cases or settings, doing an individual case study provides researchers with necessary skills when dealing with a specific individual as highlighted in the study of a woman with cognitive impairments and when doing research.

More discussions on single subject studies in HCI can be found in Chapter 2.

- Software engineering

In software engineering, it is common to focus on an individual case. Barry Boehm, for example, developed a form of risk analysis for software development projects that was unique to risk analysis in other industries such as insurance in that it focuses in depth on an individual case. The risk analysis is used to identify and resolve all the possible risks in a particular project development (Boehm, 1989).

- Artificial Intelligence (AI)

As in software engineering, some of AI tools are developed to deal with an individual case. For example, in case-based reasoning (CBR) systems, expertise is embodied in a library of past cases, rather than being encoded in classical rules. Each case typically contains a description of a problem, plus a solution and/or an outcome. To solve a current problem, the problem is matched against the cases in the case base, and similar cases are retrieved. The retrieved cases are used to suggest a solution which is reused and tested for success. If necessary, the solution is then revised. Finally the current problem and the final solution are retained as part of a new case.

1.4 The single subject study in the thesis

A common criticism made against single subject studies is that their results can only be applied to similar settings. This criticism is also applied in HCI. Because of this criticism, little is done in HCI studies to apply the results of single subject studies to a wider user population and to find out how single subject studies can actually benefit HCI research as a whole.

There are many HCI studies that involve or focus on individual cases. These single subject studies if capitalised on are capable of delivering benefits to HCI as the following.

1.4.1 The single subject study and generalisation

Although an individual case study is able to provide thick data, it is argued that it has limited external validity (Graziano & Raulin, 1997; Liebert & Liebert, 1995) meaning that the results of the individual case study can be generalised only to another identical case in the same setting (Christensen, 1987). However, Platt (1992) and Ragin & Becker (1992) argue that we can generalise from an individual case. It depends on the case we are speaking of and how it is chosen. Campbell (1969) notes that generalisation is a product of careful analysis. W. I. B. Beveridge (1950) in his book 'The Art of Scientific Investigation' notes that "more discoveries have risen from intense observation than from statistics applied to large groups".

In this thesis I will show how generalisations from single person studies are relevant to other people. For example, Chapter 5 discusses a mother using her mobile phone and shows how this can actually provide a general understanding of other mothers use their mobile phones in their everyday lives. Similarly, in Chapter 6, a discussion of how an individual copes with stressful life feeds the design of a usable application for other people who suffer from similar condition.

Thorngate (1986) suggests that in order "to find out what people do in general, we must first discover what each person does in particular, then determine what, if anything, these particulars have in common". Other researchers such as Cozby (1993) emphasises the higher generality of multi-subject studies. This aspect of multi-subject research also characterises the individual (single) subject study as illustrated by Johnston and Pennypacker (1980) in their research in reading.

1.4.2 The single subject study as a research strategy

Another criticism against an individual case study is that it is merely suited for a pilot study. In HCI, a pilot study is a small trial run of the main study (Preece et al., 2002). The aim is to make sure that the plan is viable before embarking on the real study. Baker (1994) suggests that pilot study can also be the pre-testing or 'trying out' of a particular research instrument. For example, pilot study provides an opportunity to practice interviewing skills, or to check that questions in a questionnaire are clear, or that an experimental procedure works properly.

A single subject study can serve as a pilot study, however, it is wrong to say that it is only suited for such study. An individual case study can be considered as a research strategy. Yin (1994) argues that a single case study is an empirical inquiry that "investigates a phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 1994).

Chapter 4 discusses a single person study as a research methodology. This chapter emphasises the selection of a subject and consequences of an in-depth study.

1.4.3 The single subject study helps growth as a researcher and a designer

Studying one person helps the researcher develop important user study skills. Some of user study skills developed will be discussed in four chapters. Chapters 5 and 8 discuss specific person skills: a need for having positive regard for the subject and having to care for the subject. These person skills may help the researcher work with other people better. Chapters 5 and 6 describe how studying one person can help the researcher do a group study and make generalisations.

In addition to research skills, studying a person can also help develop specific design skills. Chapter 7 will discuss how studying one person helps the designer empathise understanding of the subject onto the design of an application. Empathy is often a result of shared feelings and understanding between two persons. In this research, shared feelings and understanding are obtained through shared experiences, beliefs, and viewpoints with the subject.

1.5 Thesis statement

How it can be learned from an individual that can be useful for designing for people in general.

1.6 Research Objectives

The research aims to:

- understand how a single person uses her mobile phone in her everyday life,
- generalise this understanding to a wider user population,
- understand things that could be overlooked with a group study,
- gain insights into the study methodology

1.7 Thesis structure

This thesis covers many aspects of HCI including user studies and interaction design; use of mobile phone; empathy; personality psychology; friendship; person skills; culture; and religious beliefs.

Chapter One began with overviews of some research that uses or focuses on single cases, thesis statement, and research objective.

At the beginning, a single person study was merely a technique. However, as the study progressed, it gradually became important as methodological issues. Due to this, it affected the way the Chapters 2-8 are structured and presented in this thesis. While Chapter 2 in particular comes first, in fact, much of the literature was studied much later when the focus of the thesis became clear.

Chapter Two describes how single person (case) studies are done in HCI. Criticisms against and recommendations for single subject studies are also discussed. The chapter ends with a discussion on why HCI should capitalise on single subject studies.

Chapter Three focuses on doing user studies. The discussion begins with some understanding of participant observation and overviews of data collection methods to be used in the research: diary and interviews. Certain issues in feminist research are discussed. The chapter concludes with a discussion of friendship of a prolonged study, an issue that is returned to more detail in Chapters 5 and 8.

Chapter Four discusses the use of mobile phone. The chapter starts with the impacts of psychological and social effects of the mobile phone on the users. The discussion is then focused on the gendered use of mobile phone and text messaging.

The chapter concludes with a discussion of a single user of mobile phone, an issue that will be discussed in more detail in Chapters 6 and 7.

Chapter Five describes the single person study as a research methodology. The discussion begins with the selection of a subject and a research strategy. Because of a prolonged, in-depth study, it affects the way the researcher deals with the subject and therefore reports data. Most of data reported are based on personal interpretation as a friend. Although friendship can offer benefits in the design process as discussed at the end of this chapter and in Chapters 6 and 8, it raises reliability and ethical issues as discussed in both Chapters 5 and 8. The chapter ends with a discussion on the critical aspects of single person study and friendship observation that can contribute benefits in HCI studies.

Chapter Six studies a single person in order to understand how she actually uses her mobile phone. An advantage of the single person study is that it helps understand the uniqueness of that person which could be overlooked with a group study. From the study, we can understand her reasons for having relied on her mobile phone alarm and for appreciating text messaging. Due to similarities, the researcher can empathise with the subject. Chapter 7 will further discuss this. This chapter ends with a discussion on the reflection of experience in doing the single person study: how the study helps the researcher understand herself better.

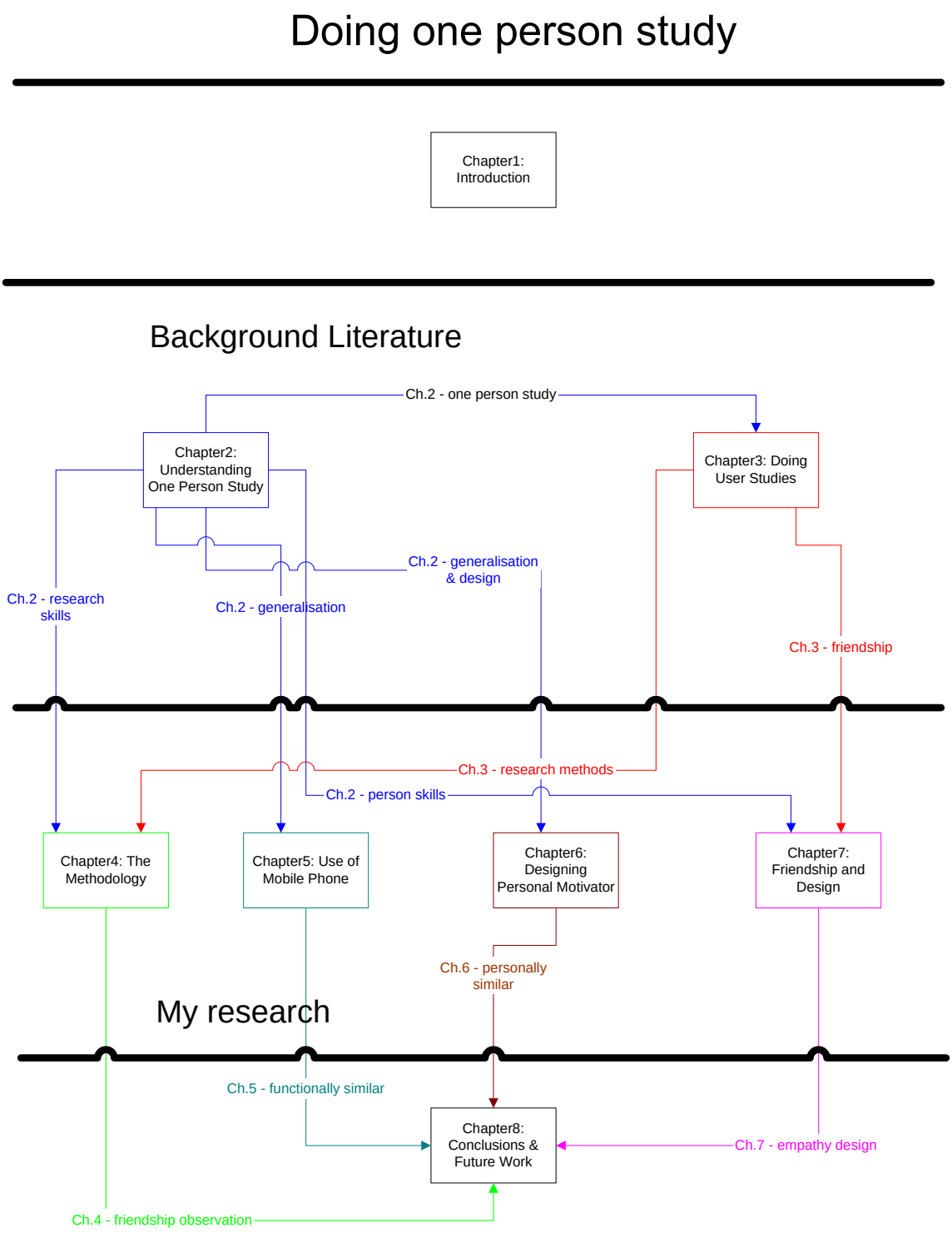
Chapter Seven discusses how generalisations are possible from one person. To do this, a prototype called 'Personal Motivator' is designed based on deep understanding of the subject (as discussed in Chapter 6). The prototype is then tested on a group of mobile phone users who are diverse in terms of age, gender, lifestyles, and religious and cultural beliefs. These participants are grouped based on user profiles. Although Personal Motivator is designed exclusive for the subject, it works for some of these participants. The chapter discusses possible factors for the effectiveness of the prototype. The chapter concludes with a discussion on

empathy design: understanding an individual helps design for people who are personally similar to the individual studied.

The final chapter talks about friendship and its implications on the study. The chapter begins with an introduction to the Malaysian community in Lancaster (to which I and the subject belong). It then discusses several issues related to friendship – how closeness to the subject, for example, similarities, personalities, and shared understanding, leads to closer relationship. Because of this friendship, it affects the role played by the subject in the research: she becomes a co-researcher. However, friendship does affect the validity of this research. Issues related to ethics of doing research are discussed in this chapter. This chapter ends with a discussion on how friendship can bring values and risks to design activity.

I conclude the thesis with a summary of my work and a discussion of lessons learned and of future work.

Figure 2 . Diagram that shows how chapters are connected to form the thesis



1.8 Language Use

In the thesis, the following words have been used for:

I:

- anecdotes – experiences that the researcher has had or witnessed serve as useful illustrations of a point she is arguing,
- references to the researcher's own experiences that explain her interest in an issues or help to establish authority on a topic.
- is largely used in Chapters 4 and 7.

We:

Depending on the context,

- references to the researcher and the subject sharing similar opinions, beliefs, and experiences, and
- reference to the researcher and the reader explaining issues that are generally believed together.

She or her:

- reference to the subject.

P1 or KN:

- reference to the subject: P1 in Chapter 1 and KN for the rest of the thesis.

Chapter 2

This chapter highlights the following:

- Roots of single subject study
- Techniques of single subject studies
- Overview of single subject studies in HCI
- Some criticisms against single subject studies
- Reasons that HCI should capitalise on single subject studies

Chapter 2

Understanding Single Subject Studies

2.1 Introduction

This chapter revisits single subject studies which have been mentioned in Chapter 1 but in more detail.

Single subject studies have roots in psychology and have been successfully applied in many academic areas. The study can be done either through exploratory study or experimental research.

A single subject study is not a new form of research; in fact, it is rather common in HCI. Single subject means one unit. This one unit usually means a sample size of one person such as this thesis. The main advantage of a single subject study is its capability of producing rich data. However, the single subject study is often criticised. Some of the criticisms are (a) one cannot generalise from a single case, (b)

it may be well suited for pilot studies, and (c) it is subjective, giving too much scope for a researcher's own interpretations.

Nevertheless, single subject studies have proved that they can bring advantages to certain studies in HCI and applied psychology. Some of the advantages are (1) researcher is able to see the uniqueness of an individual or a subject which may be overlooked with group studies (Chapter 5), (2) generalisations are sometimes possible from a single person (Chapters 5 and 6), and (3) researcher can develop herself as a researcher and a designer (Chapter 4).

2.2 Roots of single subject studies

Single subject study has its roots in physiology and psychology, disciplines in which individual organisms served as the basis for discoveries including principles of learning, memory, sensation and perception, and the neural basis of language processing.

The following are some of pioneers of psychology who used a single subject in their studies:

Gustav Fechner[5] (1801–1887) who used himself as a subject developed measures for determining sensory thresholds and just noticeable differences (JNDs) in various sensory modalities by carefully studying responses to different stimulus intensities or locations.

Paul Broca's[6] (1824–1880) study of one patient, Lebornge, in 1861 led to early ideas about language and brain function. He discovered that speech is produced at the

[5] A German experimental psychologist who is a pioneer in experimental psychology and the founder of pscyhophysic.
[6] A French physician, anatomist, and anthologists.

centre of the brain located in the ventroposterior region of the frontal lobes (now known as the Broca's area).

Ivan Pavlov[7] (1849–1936), interested in the physiology of the digestive system, also studied the behaviour of individuals; i.e., when studying the salivary response of individual dogs to food when paired with other environmental stimuli, he discovered principles of conditioned learning.

Herman Ebbinghaus[8] (1850–1909), using himself as a subject, was the first to investigate the properties of human memory. Using nonsense syllables as stimuli, he developed basic metrics of learning and forgetting, i.e., the learning curve, the forgetting curve, the serial position curve, and he invented several tests of memory, including measures of recall and recognition.

One important outgrowth of studying individual subjects was the discovery of individual differences, i.e., that not all humans respond the same way under particular stimulus conditions. Adolphe Quetelet[9] (1796–1874), one of the most influential social statisticians from the nineteenth century, showed that many human traits follow a normal curve, and that an average can be computed by studying a particular phenomenon in a group of individuals. Among other phenomena, he collected and analysed data on crime and mortality, and influenced development of the Quetelet index, a measurement of obesity. His concept of the 'average man', as the ideal prototype of nature with deviations from it considered errors, was highly criticised. However, the fact that individual differences exist, that central tendencies can be computed, and that inter-subject variability (or error) can be accounted for or "averaged out" led, not surprisingly, to the use of mathematical methods to study human traits and served as the foundation for

[7] A Russian physiologist, psychologist, and physician who is widely known as the first describing a phenomenon known as classical conditioning in his experiment with a dog.
[8] A German psychologist who pioneered experimental of memory and discovered the learning and forgetting curves.
[9] A Belgian astronomer, mathematician, statistician, and sociologist.

studying groups of individuals. Notably, it was Fechner who first applied statistical methods to psychological problems.

2.3 Techniques to study a single subject

Literature suggests that if we are looking for exploration, we should undertake a qualitative research. However, if we are looking for causal-effect relationships, we can conduct a design experiment that employs some techniques from time-series study.

2.3.1 Exploratory research

If we are looking for exploration, we may undertake a qualitative research. Qualitative research studies typically examine the interplay of all variables in order to provide as complete an understanding of an event or situation as possible. This type of comprehensive understanding is arrived at through a process known as "thick description". Thick description involves an in-depth description of the entity being evaluated, the circumstances under which it is used, the characteristics of the people involved in it, and the nature of the community in which it is located. It also involves interpreting the meaning of demographic and descriptive data such as cultural norms and mores, community values, ingrained attitudes, and motives.

- *Case study*

A case study is a particular method of qualitative research. Rather than using large samples and following a rigid protocol to examine a limited number of variables, case study methods involve an in-depth, longitudinal examination of a single instance or event known as a case. Case studies provide a systematic way of looking at events, collecting data, analysing information, and reporting the results. As a result, the researcher may gain a sharpened understanding of why the instance happened as it did, and what might become important to look at more extensively in

future research. Case studies lend themselves to both generating and testing hypotheses (Flyvbjerg, 2006).

Robert Yin (1994) suggests that case study should be defined as a research strategy, an empirical inquiry that investigates a phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. Since phenomenon and context cannot always be distinguished in real life situations, Yin later added that case study research can include single and multiple case studies and also quantitative evidence. Yin also emphasised that case study research relies on multiple sources of evidence and benefits from prior development of theoretical propositions to guide data collection and analysis.

In scholarly circles, case studies are frequently discussed within the context of qualitative research and naturalistic inquiry. In HCI, case studies are often referred to interchangeably with ethnography, field study, and participant observation. The underlying philosophical assumptions in the case are similar to these types of qualitative research because each takes place in a natural setting (such as a classroom, neighbourhood, or private home), and strives for a more holistic interpretation of the event or situation under study.

However, Yin (1994) emphasises that case studies should not be confused with other qualitative research. He warns that case studies need not always include direct, detailed observations as a source of evidence. Case studies, thus, can include and even be limited to quantitative evidence. As a matter of fact, he also suggests that case studies can be based on any mix of quantitative and qualitative evidence (Yin, 2002). This is also supported and well-formulated in (Lamnek, 2005): "The case study is a research approach, situated between concrete data taking technique and methodologic paradigma".

Very often, the term "case study" is misused – people often use it but do not really refer to a case study, but rather to a "case history" or "case material" (MacNealy, 1997). Since case study research often use the same strategies as other types of research, it might be hard to distinguish case study research from other qualitative empirical research methods (MacNealy, 1997). Most case studies are also performed over a rather short period of time as opposed to longitudinal.

A case study can be exploratory, descriptive, or explanatory (Yin, 1994). Thus, it is a research strategy that can be used for various purposes. The trick is to decide when a case study is a better approach than other research strategies.

Yin (1994) suggests that three (3) main conditions must be reviewed:

1. the type of research question
2. the investigator's control over actual behavioural events
3. the degree of focus on contemporary events

Table 2. Relevant situations for different research strategies. Source: Yin (1994)

Strategy	Form of research question	Requires control over behavioural events	Focuses on contemporary events
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival analysis	Who, what, where, how many, how much	No	Yes/no
History	How, why	No	No
Case study	How, why	No	Yes

Case study research generally answers one or more questions which begin with "how" or "why". According to Yin (1994), "how" and "why" questions are likely to favour case study, history, and experiment. It is important to define the research question carefully. However, in order to choose, it is necessary to look at investigator's control over actual behavioural events. When there is no access or control, history is the preferred strategy. However, when the focus is on contemporary events, case study will be preferred. Case study uses many of the same techniques as history, but adds direct observation and systematic interviewing.

2.3.2 Experimental research

Another method to study a single subject is through an experimental design. It is used to examine causal-effect relationships between dependent and independent variables in research. This method is more common in applied psychology such as in clinical studies and counseling and in special education, but not common in HCI.

The single subject design experiment is narrower in scope than the case study. Only a few variables are examined so that the outcomes can objectively be measured. Typically, a time-series design is used to study the behavioural change that an individual exhibits as a result of some treatment. Basically, the participant is exposed to a no-treatment and a treatment phase and performance is measured before and after introducing the treatment, as well as after the treatment has been withdrawn.

- *Single subject design*

Single subject design is an experimental technique where one subject or a small number of subjects is studied intensively. Single subject designs are thought to be a direct result of the research of B. F. Skinner who applied the techniques of operant

conditioning[10] to subjects and measured the outcomes at various points in time. Because of this, single subject designs are often considered the design of choice when measuring behavioural change or when performing behavioural modification.

Unlike much traditional group-data analysis, these designs allow for the study of response change in single individuals. Thus, although there may be any number of subjects in an investigation, the designation single-subject means that each subject's behaviours and outcomes are analysed individually, not averaged with other members of an experimental or control group. In this respect, the method has something in common with case study research. However, single subject experimental studies allow the researcher to describe cause-and-effect relationships between independent and dependent variables. Here, the emphasis is on examining the functional relationship between an independent variable (the intervention) and a dependent variable (the outcome measure) for a particular individual. Typically, the dependent variable(s) focus on behaviours that are measurable and practically important for success of the intervention (treatment).

There are several single subject researchers who have been innovators and pacesetters. For example, as early as 1947, Thorne had suggested certain guidelines for single subject experiments, however, these had little impact. Twelve years later when Shapiro and Ravenette (1959) presented a design model, the A-B-A-B design, which formed the basis for a present, widely used analysis system in single subject experiments. The essential components of this design were a no-treatment phase (A) and a treatment (B), and followed by the withdrawal of the treatment (A), and the re-introduction of treatment (B).

Other researchers are also credited with their contributions towards the single subject experiments such as Shapiro (1961) who developed 'the called-for methodology' such as definition, manipulation, and repeated administration of

[10] The use of consequences to modify the occurrence and form of behaviour.

independent variables with single subjects, and Sidman (1960) who outline several methods for replication of single subject experiments within and across individuals for establishment of hypotheses.

From a different disciplinary perspective, Campbell and Stanley (1963) suggested equivalent time-series designs which involved basic principles of the A-B-A-B design for use in psychological and educational research. Meanwhile, Bellack and Chassan's (1964) pharmacological work further advanced the A-B-A-B design prototype. Later, Chassan (1967) suggested appropriate statistics for extending single-subject analyses. In 1968, Baer, Wolf, and Risley introduced the multiple-baseline design which widened the analysis systems available for examining research questions with single individuals within an experimental framework.

As this methodology has evolved over the last several decades, the literature has become replete with variants of the basic research designs, as well as principles for conducting robust studies and interpreting analyses.

2.4 Overview of Single Subject Study in HCI

Single subject study in HCI is often done using case study strategy. Case study is rather a common method used in many HCI studies. This thesis, however, presents only seven (7) case studies because these cases provide understanding of how case studies can be used in HCI. In general, case studies are used for the following reasons:

- *For evaluation*

Many HCI single case studies are done for evaluative purposes. In order to understand how handheld computers can support learning in a classroom, Luchini and her colleagues (2003) at University of Michigan, for example, evaluated their own handheld learning tool, Pocket PiCoMap, to identify challenges that students have faced in their learning activities. Based on these findings, they came up with design guidelines that would be used to analyse two other handheld tools.

Long and Hill (2005) evaluated an air traffic management (ATM) simulation at Manchester Ringway Control Centre to validate whether the ATM has applied design knowledge, both substantive and methodological. The study was also carried out to identify and diagnose design problems associated with controller planning horizons. The results are generally applied to other ATM studies: ATM researchers are encouraged to include methodological knowledge, should prepare separate reports for both researchers and practitioners, and should build on each other's work.

Other examples include Hahn (2001) who studied ebay (www.ebay.com) to understand how design of such marketplace may affect how people browse and search for products online and Wong and Blandford (2003) who used various techniques to study an ambulance control system in Wales, to understand how information is collected and decision is made in a complex situation. This study involves multiple users but in a single system setting.

- *For understanding user requirements*

Studying a particular person helps understand specific design problems or user requirements that are needed for the development of an application for a specific group of people. For example, Shinohara and Tenenberg (2007) observed a blind

college student interacting with various technologies in her home to understand the relationship of technology function to the meanings and values that a blind person attributes to technology use in different settings.

Similarly, Paradise and her colleagues (2004) studied a woman who has suffered from a mild traumatic brain injury to understand how she copes with her everyday routines. This understanding is highly needed for the design of an application that is aimed to increase individuals with cognitive impairments' functional independence in the home environment.

- *For teaching particular design skills*

Single subject study is also used for teaching purposes. It often supplements classroom teaching to enhance students understanding on a particular topic before they can do projects. For example, Rosson and her colleagues (2004) introduced individual case studies 'just in time' to support students semester long projects. They constantly develop case materials and activities and aim to share and further expose their case materials and methods to other HCI instructors.

2.5 Criticisms against Single Subject Evidence

2.5.1 Incapable of generalising

A frequent criticism of single subject studies is that its dependence on a single subject renders it incapable of providing a generalising conclusion. Generalizing from a single study can be highly problematic. Even in the case of the traditional group experimental design where sampling strategies involve random assignment, findings may have limited generality to any particular individual within the population. Thus, concerns raised about generalisability of single-subject research

studies may actually share much in common with other experimental approaches as well.

Rather than emphasising the low generality of single-subject studies, other authors emphasise the higher generality of multi-subject studies (Cozby, 1993). The ability to generalise in single-subject research is directly related to the number of replications performed and to the specificity of methodology in the original study. Therefore, authors should be encouraged to incorporate many different replications, as well as to replicate earlier studies. To establish external validity, single-subject researchers may undertake replications of the same experiment with other subjects, and/or replications in other settings. As Wixson (1993) has suggested, "many replications of small studies may inform us as well as one large study that attempts to control so many factors that we have little 'ecology validity'" (see Palincsar & Parecki, 1995, for a more detailed discussion).

Nevertheless, Yin (1994) warned that the relative size of the sample whether 2, 10, or 100 cases are used, does not transform a multiple case into a macroscopic study.

It is incorrect to conclude that one cannot generalise from a single subject study. Flyvberg (2006) argues that it depends on the case one is speaking of and how it is chosen. W.I.B. Beveridge (1950) observed immediately prior to the breakthrough of quantitative revolution: "More discoveries have risen from intense observation than statistics applied to large groups".

A particular single case study is ideal for generalising using the type of test that Karl Popper (1959) called 'falsification', which in social science forms part of critical reflexivity. Falsification is one of the most rigorous tests to which a scientific proposition can be subjected: if just one observation does not fit with the proposition, it is considered not valid generally and must therefore be either revised or rejected. Popper used the famous example 'all swans are white' and proposed that

just one observation of a single black swan would falsify this proposition and in this way have general significance and stimulate further investigations and theory building. The case study is well-suited for identifying 'black swans' because of its in-depth approach: what appears to be 'white' often turns out on closer examination to be 'black'.

However, this does not mean that individual case is always appropriate or relevant as a research method or that large, random sample studies are without value. The choice of method should clearly depend on the problem under study and its circumstances.

2.5.2 Single subject study as pilot study

A single subject study is claimed to be most useful for generating hypotheses in the first steps of a total research process. This misunderstanding derives from the previous misunderstanding that one cannot generalise on the basis of individual cases.

Eckstein (1975) argues that although individual case studies are better for testing hypotheses, they are valuable at all stages of the theory-building process. Testing of hypotheses relates directly to the question of 'generalisability', and this in turn will relate to the question of case selection.

Ragin (1992) and Rosch (1978) suggest that generalisability of single case studies can be increased by the strategic selection of cases. When the objective is to achieve the greatest possible amount of information on a given problem or phenomenon, a representative case or a random sample may not be the most appropriate strategy. This is because the typical or average case is often not the richest in information. However, atypical or extreme cases often reveal more information because they activate more actors and more basic mechanisms in the situation studied. In addition, from both an understanding oriented and action-oriented perspective, it is

often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how they frequently they occur. Random samples emphasising representativeness will seldom be able to produce this kind of insight (Flyvberg, 2006).

Flyvberg (2006) classifies three types of information-oriented cases which can guide researcher in selecting a case. First, extreme case can be well-suited for getting a point across in an especially dramatic way, for example, in Freud's "Wolf Man[11]" and Foucault's "Panopticon[12]". Second, a critical case can be defined as having strategic importance in relation to the general problem. Flyvberg advises that when looking for critical cases, it is a good idea to look for either 'most likely' or 'least likely' cases because they either clearly confirm or irrefutably falsify propositions and hypotheses. He further suggests that 'most likely' cases are the ones which are well suited to falsification of propositions, whereas 'least likely' cases are the ones which are most appropriate to tests of verification. Lastly, a paradigmatic case cannot be expressed as rules or theories. Dreyfus et al. (1986) suggest that intuition is central to identifying paradigmatic cases because such practice relies on taken-for-granted procedures that are largely intuitive. These procedures however must be sensible to other members of the scholarly communities of which we are part.

[11] The Wolf Man was a young Russian who was in touch with reality only after he'd relieved himself with an enema. The Wolf Man's intestines had to be empty before he could function properly. This was a famous bizarre psychological case of Freud's because he treated the boy inside the man – not the man himself. Freud interpreted the Russian's dream of wolves with foxes' tails as witnessing his mother and father having sex, and focused on this infantile neurosis.

[12] The **Panopticon** is a type of prison building designed by English philosopher Jeremy Bentham in 1785. The concept of the design is to allow an observer to observe (*-opticon*) all (*pan-*) prisoners without the prisoners being able to tell whether they are being watched, thereby conveying what one architect has called the "sentiment of an invisible omniscience."[1]

Table 3. Summary of Information-oriented selection

Information-oriented selection	Purpose
Extreme/deviant cases	To obtain information on unusual case, which can be especially problematic or especially good in a more closely defined sense.
Critical cases	To achieve information that permits logical deductions of the type, "If this is (not) valid for this case, then it applies to all (no) cases".
Paradigmatic cases	To develop a metaphor or establish a school for the domain that the case concerns.

Various strategies of selection, however, are not necessary mutually exclusive. For example, a case can be simultaneously extreme, critical, and paradigmatic. The interpretation of such a case can provide a unique wealth of information because one obtains various perspectives and conclusions on the case according to whether it is viewed and interpreted as one or another type of case.

2.5.3 Subjective bias

Diamond (1996) suggests that single subject study and other qualitative methods suffer from what he called a "crippling drawback" because they do not apply 'scientific methods' by which Diamond understood as useful methods for "curbing one's tendencies to stamp one's pre-existing interpretations on data as they accumulate".

Francis Bacon (1853) saw this bias towards verification not simply as a phenomenon related to the single cases in particular but also as a fundamental human characteristics. He expressed:

> The human understanding from its peculiar nature, easily supposes a greater degree of order and equality in things than it really finds. When any proposition has been laid down, the human understanding forces everything else to add fresh support and confirmation. It is the peculiar and pertual error of the human understanding to be more moved and excited by affirmatives than negatives. (p.xlvi)

Moreover, the question of subjectivism and bias towards verification applies to all methods, not just to the single subject study and other qualitative methods. For example, in choosing categories and variables for a structured questionnaire, the element of arbitrary subjectivism is significant even for a quantitative research investigation. Flyvberg (2006) argued that the probability is high that this subjectivism survives without being thoroughly corrected during the study and it may affect the results simply because the quantitative researcher does not get close to those under study and therefore, it is less likely to be corrected by the study obejcts 'talking back'.

While the bias towards verification is general, single subject and other qualitative methods are often criticised for allowing more room for the researcher's subjective and arbitrary judgment than other methods. Therefore, they seem as less rigorous than do quantitative methods. In one aspect, the criticism is useful because it sentisises qualitative researchers to an important issue. However, Campbell and others have shown that such criticism is fallacious because single subject study has its own rigour, different to be sure, but no less strict than the rigour of quantitative methods. As in quantitative research, the basic strategy to ensure rigour in single subject study is systematic and self conscious research design, data collection, interpretation, and communication.

- Ensuring rigour in single subject studies

Much social science is concerned with classifying different "types" of behaviour and distinguishing the "typical" from the "atypical." In quantitative research this concern with similarity and difference leads to the use of statistical sampling so as to maximise external validity or generalisability. Although statistical sampling methods such as random sampling are relatively uncommon in qualitative investigations, there is no reason in principle why they cannot be used to provide the raw material for a comparative analysis, particularly when the researcher has

no compelling a priori reason for a purposive approach (Mays & Pope, 1995). Qualitative data collection is generally more time consuming and expensive than, for example, a quantitative survey. Due to this, Mays and Pope (1995) argue that it is not usually practicable to use a probability sample. Furthermore, statistical representativeness is not a prime requirement when the objective is to understand social processes.

An alternative approach, often found in other qualitative studies, is to use systematic, non-probabilistic sampling. The purpose is not to establish a random or representative sample drawn from a population but rather to identify specific groups of people who either possess characteristics or live in circumstances relevant to the social phenomenon being studied. Informants are identified because they will enable exploration of a particular aspect of behaviour relevant to the research. This approach to sampling allows the researcher deliberately to include a wide range of types of informants and also to select key informants with access to important sources of knowledge.

"Theoretical" sampling is a specific type of non-probability sampling in which the objective of developing theory or explanation guides the process of sampling and data collection (Glaser & Strauss, 1967). Thus, the analyst makes an initial selection of informants; collects, codes, and analyses the data; and produces a preliminary theoretical explanation before deciding which further data to collect and from whom. Once these data are analysed, refinements are made to the theory, which may in turn guide further sampling and data collection. The relation between sampling and explanation is iterative and theoretically led.

In many forms of qualitative research the raw data are collected in a relatively unstructured form such as tape recordings or transcripts of conversations. The main way of ensuring the reliability of their analyses is in maintaining meticulous records of interviews and observations and by documenting the process of analysis in detail (Mays & Pope, 1995). While it is possible to analyse such data

singlehandedly and use ways of classifying and categorising the data which emerge from the analysis and remain implicit, more explicit group approaches, which perhaps have more in common with the quantitative social sciences, are increasingly used. The interpretative procedures are often decided on before the analysis. Thus, for example, computer software is available to facilitate the analysis of the content of interview transcripts (Seidel & Clark, 1984). A coding frame can be developed to characterise each utterance (for example, in relation to the age, sex, and role of the speaker; the topic; and so on), and transcripts can then be coded by more than one researcher (Krippendorff, 1980). One of the advantages of audiotaping or videotaping is the opportunity the tapes offer for subsequent analysis by independent observers.

- Ensuring the reliability and the validity of an analysis

One way to ensure the reliability of the analysis of qualitative data is by organising an independent assessment of transcripts by additional skilled qualitative researchers and comparing agreement between the raters.

Alongside issues of reliability, the researchers should give attention to the validity of their findings. Validity of the data can be enhanced with a method called “triangulation". Pollit and his colleagues (1990) define triangulation as to an approach to data collection in which evidence is deliberately sought from a wide range of different, independent sources and often by different means.

Validation strategies sometimes used in qualitative research are to feed the findings back to the participants to see if they regard the findings as a reasonable account of their experience (McKeganey & Bloor, 1981) and to use interviews or focus groups with the same people so that their reactions to the evolving analysis become part of the emerging research data (Oakley, 1974). However, Brannen (1992) argues that if these techniques are used in isolation, they assume that fidelity to the participants' commonsense perceptions is the touchstone of validity. In practice, this sort of validation has to be set alongside other evidence of the plausibility of the research

account since different groups are likely to have different perspectives on what is happening (Brannen, 1992).

This thesis highlights the researcher's subjective bias on the subject because of the friendship that has been established during the study. As this personal judgment is inevitable due to a part of human learning process (as discussed in the following section), there are strategies to ensure rigour in the study of the single person. These strategies that help minimise the effect of personal biases will be discussed in Chapter 4.

2.6 Reasons HCI should capitalise on single subject studies

- One person study allows for understanding of things that might be overlooked with group studies

Studying an individual helps understand things that are important for the individual but might be overlooked if more people are studied at one time. Although the results of group studies can be generalised to other people, group data often mask individual differences or important needs. Chapter 5 will show that how studying people individually helps understand the differences or uniqueness of each individual.

Similarly in behavioural studies, a single subject study helps a researcher determine the effectiveness of an intervention on an individual's distinct behaviour under specified or proscribed condition. Meanwhile, in social science, a case study of a single subject helps a researcher gain deep understanding of things and therefore helps generate and test research hypotheses.

- Generalisations are sometimes possible for other people from one subject

Studying a person can help a researcher design for other people in general. Chapter 6 will show how understanding an individual helps build an application that not only works for herself but more importantly works for others, too. Deep understanding and careful observation can be a result of a single subject study and are the skills needed for doing generalisations.

- Learning is possible from a single subject

The difference between large and single samples can be understood in terms of the phenomenology for human learning. Flyvberg (2006) suggests that if one assumes that the goal of the researcher's work is to understand and learn about the phenomena being studied, then research is simply a form of learning. If one assumes that research, like other learning processes, can be described by the phenomenology for human learning, it then becomes clear that the most advanced form of understanding is achieved when researchers place themselves within the context being studied (Flyvberg, 2006). In this way, researchers can understand the viewpoints and the behaviour which characterises social actors. Giddens (1982) states that valid descriptions of social activities presume that researchers possess those skills necessary to participate in the activities. He describes:

> I have accepted that it is right to say that the condition of generating descriptions of social activity is being able in principle to participate in it. It involves "mutual knowledge", shared by observer and participants whose action constitutes and reconstitutes the social world. (p.15)

Thomas Kuhn (1987) has shown that the most important pre-condition for science including computing is that researchers possess a wide range of practical skills for carrying out scientific work. Generalisation is just one of these. The term science in German language literally means "to gain knowledge". And formal generalisation is

only one of many ways by which people gain and accumulate knowledge. Flyvberg (2006) argues that knowledge which cannot be formally generalised does not mean that it cannot enter into the collective process of knowledge accumulation in a given field or in a society. He emphaises that a purely descriptive, phenomenological case study without any attempt to generalise can certainly be of value in this process and has often helped cut a path towards scientific innovation. However, Flyvberg (2006) cautions that this is not to critise attempts at formal generalisation, for such attempts are essential and effective means of scientific development; rather, it is only to emphasise the limitations, which follow when formal generalisation becomes the only legitimate method of scientific inquiry.

Single subject study produces the type of context-dependent knowledge that research on learning shows to be necessary to allow people to develop from rule-based beginners to virtuoso experts, a term given by Pierre Bourdieu (1977), or true human experts by Hubert Dreyfus and Stuart Dreyfus (1986). Common to all experts, they operate on the basis of intimate knowledge of several thousand concrete cases in their areas of expertise. Context-dependent knowledge and experience are at the very heart of expert activity. Such knowledge and expertise also lie in the centre of the case study as a research and teaching method as a method of learning. With the point of departure in the learning process, we can now understand why the researcher who conducts a single case study often ends by casting off preconceived notions and theories. Such activity is quite simply a central element in learning and in the achievement of new insight. Flyvberg (2006) adds that simple forms of understanding can yield to more complex ones as one moves from beginner to expert.

Chapter 3

This chapter highlights the following:

- Understanding an observational technique, Participant observation, used in an exploratory study.

- Participant observation yields more accurate and extensive data, but the reliability and the validity of the data can be questioned.

- Analysing two data collection methods: diaries and qualitative interviews.

- Friendship may be a result of an in-depth study.

Chapter 3
Doing User Studies

3.1 Introduction

This chapter aims to provide some understanding in doing an in-depth study. First, a lengthy discussion on an in-depth study, participant observation is presented. Two popular data collection techniques: diaries and interviews, are discussed by highlighting their strengths and limitations. Chapter 4 will discuss how the diaries and interviews are used in the research.

Due to a prolonged study, friendship between the researcher and the subject may possibly be established as it is in this research. Gender can be a contributing factor to such a close relationship as discussed in the chapter. Although friendship can become evident in a long term study, issues of friendship are hardly discussed in HCI.

This thesis therefore aims to emphasise the significance of friendship as an observational tool that can offer benefits to HCI studies. Chapter 4 will discuss friendship affects the study, and Chapter 6 will describe how friendship helps understand a friend, therefore, design for other people based on empathy. Meanwhile, Chapter 7 will describe how friendship develops and brings consequences to the research and design activities.

3.2 Participant Observation

3.2.1 The practice of participant observation

Mairtin Mac an Ghaill (1996) suggests that a participant observer collects data by participating in the daily life of those he or she is studying. Becker (1966) notes that "the approach is close to everyday interaction, involving conversations to discover participants' interpretations of situations they are involved in". The aim of participant observation is to produce a 'thick description' of social interaction within natural settings. At the same time informants are encouraged to use their own language and everyday concepts to describe what is going on in their lives. Hopefully, in the process a more adequate picture emerges of the research setting as a social system described from a number of participants' perspectives (Geertz, 1973; Burgess, 1984). In other words, we are seeking to find meaning in the encounters and situations.

On first glance, participant observation appears to be just looking, listening, generally experiencing, and writing it all down. However, it is the most personally demanding and analytically difficult method of social research to undertake (Patton, 1986). It requires researchers to spend a great deal of time in surrounding within which researchers may not be familiar (e.g., factory floor or bank office); to secure and maintain relationships with people with who, they have little personal

affinity (e.g., criminals and market traders); to take a lot of notes on what appears to be everyday mundane happenings (e.g., people's body language and speech patterns, and their arrival and departures); to possibly incur some personal risk in their fieldwork (e.g., accidents at work); and to spend months of analysis after the fieldwork, analysing field-notes and diaries. Nevertheless, to those who are prepared and willing, it is also one of the most rewarding methods which yield fascinating insights into people's social lives and relationships (e.g., the social world of factory workers or gang members).

In this section, we shall examine the role of the researcher, access to site and data, being flexible, writing field-notes, and adequacy of observations.

- The researcher's role

Mairtin Mac an Ghail (1996) suggests that the researcher is *the* instrument of data collection. Researchers gather data by their active participation in the social world; they enter a social universe in which people are already busy interpreting and understanding their environments.

One method involves getting close to the people, sometimes living among them (as anthropologists do). Bernard (1994) says that "It involves getting close to people and making them feel comfortable enough with your presence so that you can observe and record information about their lives". In adopting this form of study, it does not follow that researchers comprehend the situation as though it were *uncontaminated* by their social presence. For this reason, "naturalism is regarded as dishonest" (Patton, 1986) by denying the effect of the researcher on the social scene. On the contrary, the aim of understanding is actually enhanced by considering how they are affected by the social scene, what goes on within it and how people, including themselves, act and interpret within their social situations.

Another important feature in *doing* participant observation is *engagement*. In the process, the observers explicitly draw upon their own biographies in the research

process; e.g., having been personally and politically engaged as part of an ecological group before deciding to analysing it. This is an example of *reflexivity*. It implies that the orientations of researchers will be shaped by their socio-historical locations (e.g., rural areas), including the values and interests (e.g., religious and cultural norms) that these locations confer upon them. "Most events in our own society and especially settings with which we are familiar seem 'natural' and 'obvious'. We have already learned the culture and we find few things problematic" (Hammersley and Atkinson, 1983).

Junker (1960) and Gold (1958) suggest that there are four roles of field research that can assist in the process of analysing field notes:

1. *Complete participant*: the researcher employing this role attempts to engage fully in the activities of the group or organisation under investigation. Their role is also covert (hidden) for their intentions are not made explicit (e.g., a researcher investigating a racist or fascist organisation). Among its advantages, it is agreed to produce more accurate information and an understanding not available by other means.
2. *Participant as observer*: the researcher adopts an overt (open) role, and makes their presence and intentions known to the group. Despite traditional concerns with 'establishing rapport' or 'going native', for many researchers, this view of scientific inquiry has been subjected to scrutiny and criticisms. The researcher often becomes a 'fan' or supporter, though this does not mean attempting to act as one of the group – for example, in studying prostitution, it does not entail being a prostitute.
3. *Observer as participant*: the researcher moves away from the idea of participation. This usually involves one-visit interviews, and calls for relatively more formal observation (e.g., ownership and structure of a firm, rather than its internal practices and norms) than either informal observation or participation. Here, there is a possibility of mis-understanding

as it is more of an encounter between strangers that does not utilise the strengths of time in the field, so unable to understand the rules, roles and relationships.

4. *Complete observer*: the researcher is uninvolved and detached, and merely, passively records behaviour at a distance (e.g., a researcher sitting in a classroom, making observations of pupils and their teacher).

- Access

Participant observation does not simply mean 'hanging around'. To become part of a social scene and participate in it requires that the researcher be accepted to some degree.

A classic example is the work of William Foote Whyte (1955), and in particular *Street Corner Society*, his seminal study of an Italian neighbourhood in an eastern city in the USA (which he calls 'Cornerville'). The book is subtitled 'the social structure of an Italian slum'. It tells the story of his 3½ years in Cornerville and how his research became fundamentally reshaped by the experience.

Whyte began his study with very little background in community studies of this kind or of participant observation. However, what he did have was the sort of curiosity that drove him to explore different ways of conducting research with his peers; and he was prepared to join in with local ways of life - much like anthropologists in more distant places. He began by trying to work his way into the local community by hanging round hotels and bars etc. This was met with great success. He then got to know social workers in local settlement houses - and while they had a great deal of knowledge - gained to some extent from the 'outside' - Whyte was still not getting the sort of picture he wanted. One of the workers suggested he talked to 'Doc'.

'Doc' first became a key informant, then a friend and, in all essences, a co-worker. What Doc was able to do was to both provide Whyte with data about people and the neighbourhood, and to sponsor Whyte into various groups that he would have had considerable difficulties in entering. Other gatekeepers sponsored his search for a place to live and so on. In this way he gained access to key networks. However, he also had to engage in a 'crash course' in participant observation - and to learn ways of working that are very familiar to us.

> As I began hanging about Cornerville, I found that I needed an explanation for myself and for my study. As long as I was with Doc and vouched for by him, no one asked me who I was or what I was doing. When I circulated in other groups or even among the Nortons without him, it was obvious that they were curious about me.
>
> I began with a rather elaborate explanation... I gave the explanation on only two occasions, and each time, when I had finished, there was an awkward silence. No one, myself included, knew what to say.
>
> I soon found that people were developing their own explanation about me: I was writing a book about Cornerville. This might seem entirely too vague an explanation, and yet it sufficed. I found that my acceptance in the district depended on the personal relationships I developed far more than any explanations I might give. (Whyte 1955)

'Getting in', 'staying in' and 'getting out' are key moments in a participant observation study. 'Getting in' is what Whyte here referred to. 'Staying in' refers to the quality of the relationships that we develop with the research participants. As Mac an Ghaill (1996) writes:

> For me these included being one of the youngest members of staff, living in the local black community and being able to cope with and contribute to the students' sense of humour. The most unexpected aspect of the fieldwork was that the students identified with my Irish nationality. This had major implications for my research that none of the text books on social science methodology had prepared me for. For example, on a number of occasions outside of school, when the students' friends objected to my presence among them, it was pointed out that I was 'Irish not white' and this seemed to satisfy their objections.

'Getting out' involves us in leaving the research site, or abandoning our role as researcher, hopefully with the participants feeling positive about their involvement in the study.

- Utilising flexibility

One of the main advantages of participant observation is its flexibility. Fieldwork is a continual process of *reflection* and *alteration* of the focus of observations in accordance with analytic developments. It permits researchers to witness people's actions in different settings and routinely ask themselves in myriad of questions concerning motivations, beliefs and actions.

As Glesne and Peshkin (1999) write, "You are not in the research setting to preach or evaluate, nor to compete for prestige or status. Your focus is on your others, and you work to stay out of the limelight. To maintain this stance, be flexible and open to changing your point of view". Although we may start of with a research question, we must be ready to shift our focus in response to information collected during the project. Moving from one cycle to another can involve re-formulation of the research question.

In the end, our new understandings are achieved through our learner's stance and our flexibility.

- Field notes

Brandt (1972) suggests four types of observational notes: anecdotal (critical incidents) specimen records (over time recording of place/persons), field notes (less structured), and ecological descriptions (details of the environment). However, the term field note has come to cover all kinds of note-taking from observation studies (Tjora, 2006). Because of the centrality of these notes, the concern with making good field notes is important. Coffey (1996) notes that field notes are "encoded with

author's conscience, understandings, and interpretations", and the fieldworker is not only an observer, but "an actor, author, teller, and writer" (Coffey, 1996).

Field notes are the primary way of capturing the data that is collected from participant observations. Notes taken to capture this data include records of what is observed, including informal conversations with participants, records of activities and ceremonies, during which the researcher is unable to question participants about their activities and journal notes that are kept on a daily basis. DeWalt and DeWalt (2002) describe field notes as both data and analysis, as the notes provide an accurate description of what is observed and are the product of the observation process. They note that observations are not data unless they are recorded into field notes.

DeMunck and Sobo (1998) advocate using two notebooks for keeping field notes, one with questions to be answered, the other with more personal observations that may not fit the topics covered in the first notebook. They do this to alleviate the clutter of extraneous information that can occur when taking field notes. Field notes in the first notebook should include jottings, maps, diagrams, interview notes, and observations. In the second notebook, they suggest keeping memos, casual "mullings, questions, comments, quirky notes, and diary type entries" (DeMunck and Sobo, 1998). One can find information in the notes easily by indexing and cross-referencing from both notebooks by noting on index cards such information as "conflicts, gender, jokes, religion, marriage, kinship, men's activities, women's activities, and so on" (DeMunck and Sobo, 1998). They summarise each day's notes and index them by notebook, page number, and a short identifying description.

The feelings, thoughts, suppositions of the researcher may be noted separately. Schensul, Schensul, and LeCompte (1999) note that good field notes:

1. Use exact quotes when possible,
2. Use pseudonyms to protect confidentiality,

3. Describe activities in the order in which they occur,
4. Provide descriptions without inferring meaning,
5. Include relevant background information to situate the event,
6. Separate one's own thoughts and assumptions from what one actually observes,
7. Record the date, time, place, and name of the researcher on each set of notes.

DeMunck and Sobo (1998) also suggest that coding is used to select and emphasise information that is important enough to record, enabling the researcher to weed out extraneous information and focus his or her observations on the type of information needed for the study. They describe codes as

> "rules for organizing symbols into larger and more meaningful strings of symbols. It is important, no imperative, to construct a coding system not because the coding system represents the 'true' structure of the process you are studying, but because it offers a framework for organizing and thinking about the data".

- Subjective adequacy

In writing notes, it is felt that something is missing, or the observations are too selective or too general. According to Mason (1996), such notes should include six indices of *subjective adequacy* to enhance the understanding of the researcher, and ensure validity of the research:

1. *time*: the more time that the observer spends in a setting, the greater the adequacy (i.e., understanding, interpretation and meaning) achieved;
2. *place*: concentration on a physical setting ensures greater consistency, relevance and understanding;
3. *social circumstances*: the more varied the observers' opportunities to relate to a social group and milieu in terms of status, role and activities, the greater the depth;

4. *language*: the more familiar the researcher is with the language (includes culture) of a social setting, the more accurate will be the interpretation;
5. *intimacy*: the greater the personal involvement with a social group and milieu, the greater the understanding of and feeling for meanings and actions; (Intimacy is the key point of this thesis as highlighted in Chapter 7)
6. *social consensus*: the greater the mutual and shared understanding between the observer and the researched, the better the interpretation.

3.2.2 Limitations of participant observation

Several researchers have noted the limitations involved with using observations as a tool for data collection. For example, DeWalt and DeWalt(2002) note that male and female researchers have access to different information, as they have access to different people, settings, and bodies of knowledge. Participant observation is conducted by a biased human who serves as the instrument for data collection; the researcher must understand how his/her gender, sexuality, ethnicity, class, and theoretical approach may affect observation, analysis, and interpretation.

Schensul, Schensul, and LeCompte (1999) refer to participation as meaning almost total immersion in an unfamiliar culture to study others' lives through the researcher's participation as a full-time resident or member, though they point out that most observers are not full participants in community life. There are a number of things that affect whether the researcher is accepted in the community, including one's appearance, ethnicity, age, gender, and class, for example.

Another factor they mention that may inhibit one's acceptance relates to what they call the structural characteristics—that is, those mores that exist in the community regarding interaction and behavior (p.93). Some of the reasons they mention for a researcher's not being included in activities include a lack of trust, the community's discomfort with having an outsider there, potential danger to either the community or the researcher, and the community's lack of funds to further support the

researcher in the research. Some of the ways that the researcher might be excluded include the community members' use of a language that is unfamiliar to the researcher, their changing from one language to another that is not understood by the researcher, their changing the subject when the researcher arrives, their refusal to answer certain questions, their moving away from the researcher to talk out of ear shot, or their failure to invite the researcher to social events.

Schensul, Schensul, and LeCompte (1999) further point out that all researchers should expect to experience a feeling of having been excluded at some point in the research process, particularly in the beginning. The important thing, they note, is for the researcher to recognize what that exclusion means to the research process and that, after the researcher has been in the community for a while, the community is likely to have accepted the researcher to some degree.

Another limitation noted by DeWalt, DeWalt, and Wayland (1998) is that the researcher must determine to what extent he/she will participate in the lives of the participants and whether to intervene in a situation. Another potential limitation they mention is that of researcher bias. They note that, unless ethnographers use other methods than just participant observation, there is likelihood that they will fail to report the negative aspects of the cultural members. They encourage the novice researcher to practice reflexivity at the beginning of one's research to help him/her understand the biases he/she has that may interfere with correct interpretation of what is observed. Kawulich (2005) suggests that researcher bias is one of the aspects of qualitative research that has led to the view that qualitative research is subjective, rather than objective. According to Ratner (2002), some qualitative researchers believe that one cannot be both objective and subjective, while others believe that the two can coexist, that one's subjectivity can facilitate understanding the world of others. He notes that, when one reflects on one's biases, he/she can then recognize those biases that may distort understanding and replace them with those that help him/her to be more objective. In this way, he suggests,

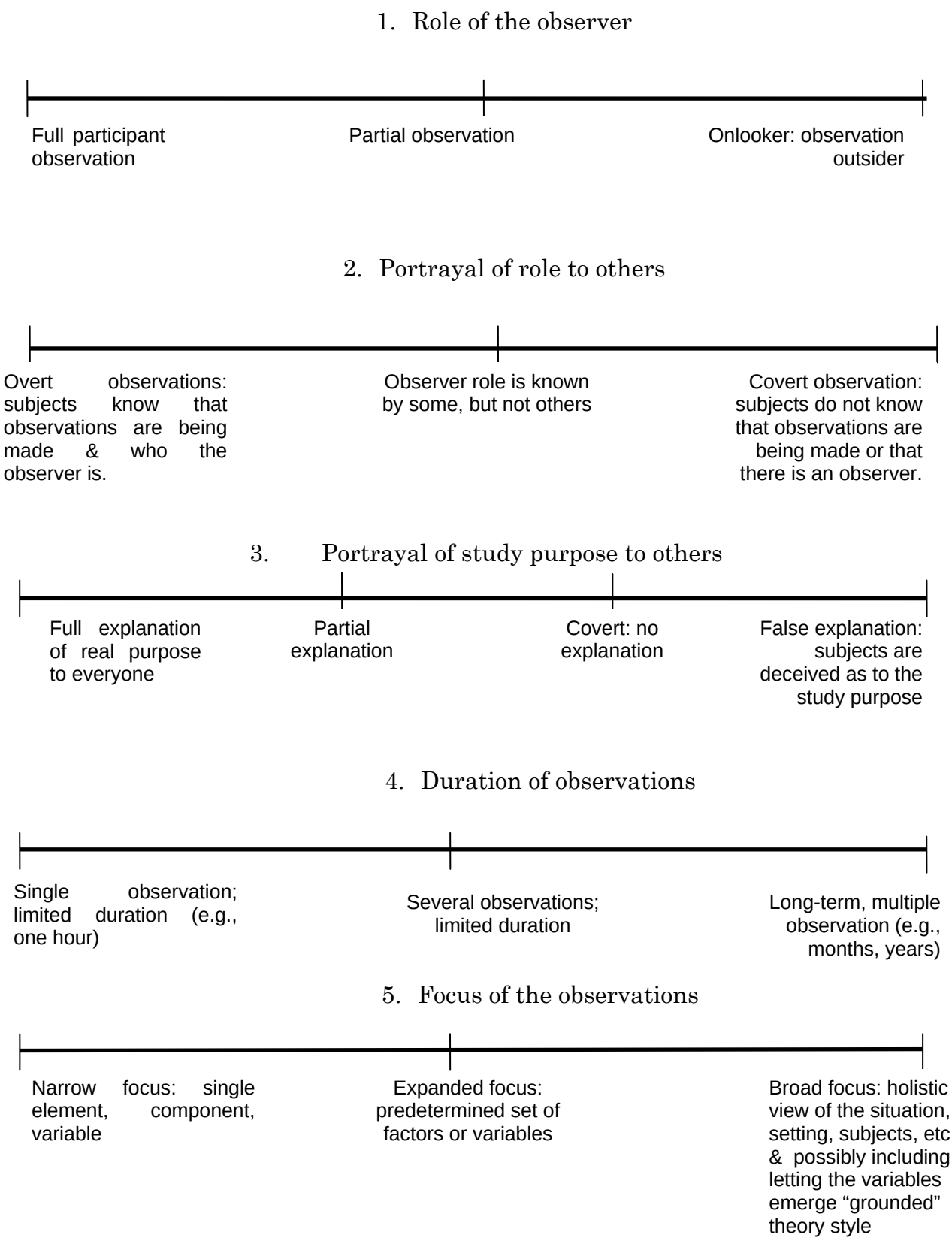
the researcher is being respectful of the participants by using a variety of methods to ensure that what he/she thinks is being said, in fact, matches the understanding of the participant. Breuer and Roth (2003) use a variety of methods for knowledge production, including, for example, positioning or various points of view, different frames of reference, such as special or temporal relativity, perceptual schemata based on experience, and interaction with the social context—understanding that any interaction changes the observed object. Using different approaches to data collection and observation, in particular, leads to richer understanding of the social context and the participants therein.

Schensul, Schensul, and LeCompte (1999) also suggest that observation is filtered through one's interpretive frames and that "the most accurate observations are shaped by formative theoretical frameworks and scrupulous attention to detail" (p.95). They said that the quality of the participant observation depends upon the skill of the researcher to observe, document, and interpret what has been observed. It is important in the early stages of the research process for the researcher to make accurate observation field notes “without imposing preconceived categories from the researcher's theoretical perspective, but allow them to emerge from the community under study” (Kawulich, 2005).

3.2.3 Five dimensions of participant observation

Patton (1986) formed a model that provides dimensions of participant observation as shown on the next page.

Figure 3. Five Dimensions of Participant Observation (adapted from Michael Quinn Patton - 1986)



3.2.3 Participation Observation in this research

Participation observation is a data gathering technique that helps understand a matter deeply. Data gathered from the observations are often rich and full of emotions. Literature, however, suggests that the quality of the participant observation depends on the skill of the researcher to observe, document, and interpret what has been observed.

I studied my own friend and my own culture. As a covert observer, I have learned first-hand that the challenges of ethnographic fieldwork are centred on the issues of quest for knowledge and ethical dilemmas. I was able to observe natural occurrences in my own culture. However, my personal knowledge about her has interfered with the interpretation of what is observed. In revealing her private life and telling others' her stories, I often face ethical dilemmas and moral choices that cannot be easily resolved with general ethical guidelines. Given the pros and cons of participant observation, it is difficult to draw a clear line between the ethics and the politics of ethnographic fieldwork (Murphy & Dingwall, 2002, Punch, 2000).

This fieldwork has the greatest strength and the greatest weakness (Hume & Mulcock, 2004). The mastery of this naturalistic data collection method comes with the lessons learned and experiences gained from the field. Given the fact that in covert participant observation the search for truth is often at odds with the conformity to conventional research ethics, field researchers must be psychologically prepared to negotiate two opposing forces that co-exist in constant tension.

In retrospection, this fieldwork not only drew me closer to my subject but also offered me an excellent opportunity for reflexive research practice. On the one hand, my participation helped me understand my subject's subjective experiences; on the other hand, it allowed me to enrich the data by adding personal and emotional depth to my work (Smith & Kornblum, 1996). Although the research process of

observation is challenging and difficult, the outcome of such work has proven its worth and benefit.

As I reflect on the experience of participant observation, especially on how to balance between the search for truth and the ethical challenges that often co-exist in parallel in ethnographic sensitive research, I come to realize that there may be no easy or universal solutions for the inherent dilemma of this unique field method. If done skilfully, the potential social benefits of covert work may outweigh its ethical risks, as the data collected can help push the boundaries of our current understanding of the people being studied.

3.3 Data Collection Techniques

Two of the data collection methods are discussed in this chapter: interviews and diaries.

3.3.1 Qualitative Interviews

- What is qualitative interview?

At the most basic level, interviews are conversations (Kvale, 1996). Kvale defines qualitative research interviews as "attempts to understand the world from the subjects' point of view, to unfold the meaning of peoples' experiences, to uncover their lived world prior to scientific explanations." **Interviews for research** differ in some important ways from other familiar kinds of interviews or conversations. Unlike conversations in daily life, which are usually reciprocal exchanges, professional interviews involve an interviewer who is in charge of structuring and directing the questioning. In some professional interview situations, such as **job interviews or legal interrogations**, the power of the questioner is much greater than

the power of the one being questioned. **Therapeutic or clinical interviews** are another special kind of professional interview, in which the purpose is to increase understanding and produce change in the person being interviewed. While **interviews for research** may also promote understanding and change, the emphasis is on intellectual understanding rather than on producing personal change (Kvale, 1996).

In practice, open-ended, qualitative interview questions are often combined with more closed-ended, structured interview formats. Qualitative interviews may be used as an exploratory step before designing more quantitative, structured questionnaires to help determine the appropriate questions and categories. Conversely, interviews may be used after results of more standardized measures are analyzed to gain insight into interesting or unexpected findings. While quantitative results are sometimes dismissed on political or methodological grounds by those who disagree with the findings, it can be harder to dismiss the actual words of participants which convey their powerful emotions. Patton (1990) gives an example of a school board which dismissed a survey showing teacher dissatisfaction as just the complaints of lazy teachers who did not want to be held accountable in their work. However, when confronted with actual quotations from teachers, reflecting both commitment to their jobs and deep concerns about problems in this particular system, the Board was more willing to hear and respond to their concerns.

- Types of Qualitative Interviews

Patton (1990) identifies three basic types of qualitative interviewing for research or evaluation: the **informal conversational interview**, the **interview guide approach**, and the **standardised open-ended interview.** Although these types vary in the format and structure of questioning, they have in common the fact that the

participant's responses are open-ended and not restricted to choices provided by the interviewer. A fourth type of interview, the **closed, fixed-response interview**, falls in the realm of quantitative interviewing. In quantitative or structured interviews, the respondent is asked to choose from a predetermined set of response categories. Each type of qualitative interview has advantages and disadvantages.

1. Informal Conversational Interview

This type of interview may occur spontaneously in the course of field work, and the respondent may not know that an "interview" is taking place. Questions emerge from the immediate context, so the wording of questions and even the topics are not predetermined. The major advantage is that the interview is highly individualized and relevant to the individual. Thus, it is likely to produce information or insights that the interviewer could not have anticipated. This type of interview requires an interviewer who is very knowledgeable and experienced in the content area and strong in interpersonal skills, since he or she will have considerable discretion in directing the interview. However, since different information is collected from different people, this kind of interview is not systematic or comprehensive, and it can be very difficult and time-consuming to analyze the data.

2. Interview Guide Approach

This may be the most widely used format for qualitative interviewing. In this approach, the interviewer has an outline of topics or issues to be covered, but is free to vary the wording and order of the questions to some extent. The major advantage is that the data are somewhat more systematic and comprehensive than in the informal conversational interview, while the tone of the interview still remains fairly conversational and informal. Like the conversational interview, this type of interview also requires an interviewer who is relatively skilled and experienced, since he or she will need to know when to probe for more in-depth responses or guide the conversation to make sure that all topics on the outline are covered. A

possible drawback is that sticking to the outlined topics will prevent other important topics from being raised by the respondent. Also, while this format is more systematic than the conversational interview, it is still difficult to compare or analyse data because different respondents are responding to somewhat different questions.

3. Standardised Open-Ended Interview

In this format, the interviewers adhere to a strict script, and there is no flexibility in the wording or order of questions. It is still considered a qualitative interview rather than a quantitative interview, because the responses are open-ended. This is the most structured and efficient of the qualitative interviewing techniques and is useful for reducing bias when several interviewers are involved, when interviewers are less experienced or knowledgeable, or when it is important to be able to compare the responses of different respondents. This may be the best choice for an evaluation if you must rely on volunteer or inexperienced interviewers or if you have limited time and money available for analyzing the data. The major drawback is that the interviewer has little flexibility to respond to the particular concerns of the individual, and there is no guarantee that the questions asked tap into the issues that are most relevant to this particular respondent.

- Design and Development of Interview Studies for Research

While much of the value of qualitative interviewing lies in its flexibility and openness, it remains extremely important for the evaluation planning team to think through the process and provide the basic structure and framework which will make the study useful and worthwhile. Kvale (1996) describes in detail seven stages in designing and implementing an interview study, which are summarized below.

1. Thematise

Before even thinking about particular methods or interview formats, the researcher needs to be clear on the purpose of the study and the topic to be investigated. The questions of "why" and "what" need to be answered before the question of "how" can be answered. This is as important in a qualitative evaluation study as in a quantitative one.

2. Design

The overall design for the study, including the later stages of analyzing and reporting, should be planned before the interviewing begins. For example, if there are no funds for transcribing or analysing interviews, it may be wise to use a more structured format that will be easier to code later.

3. Interview

To an extent that is not true in many other methods, **the interviewer is the instrument** in this type of evaluation (Guba & Lincoln, 1981, as cited in Patton, 1986). The "instrument" can be affected by factors like fatigue, personality, and knowledge, as well as levels of skill, training, and experience. Patton (1986) points out that any face-to-face interview is also an observation. The skilled interviewer is sensitive to nonverbal messages, effects of the setting on the interview, and nuances of the relationship. While these subjective factors are sometimes considered threats to validity, they can also be strengths because the skilled interviewer can use flexibility and insight to ensure an in-depth, detailed understanding of the participant's experience.

4. Transcribe

This important step prepares the material from the interview for analysis. Both Kvale (1996) and Patton (1990) provide detailed practical suggestions for this

process, ranging from ensuring that your tape recorder has good batteries to developing a sensitivity to the linguistic differences between oral speech and written text.

5. Analyse

Qualitative interviews and their transcripts produce a large volume of material which must be condensed, categorized or otherwise interpreted and made meaningful, and this may turn out to be one of the most costly and time-consuming aspects of the evaluation. If time and resources are limited, you may wish to use more standardized interview formats which are easier to code and interpret.

Methods for analysing and interpreting qualitative interviews vary widely. Kvale (1996) describes five analysis methods that include 1) meaning condensation, 2) meaning categorization, 3) narrative structuring, 4) meaning interpretation, and 5) generating meaning through ad hoc methods. Patton (1986, 1990) also addresses a number of techniques for quantifiying and analysing qualitative interview data.

The most appropriate method of analysis for any given study will depend on the purpose of our research and the nature of the material, as well as the time and resources available for this part of the process. Some methods attempt to be more objective, while others depend more heavily on subjective judgments and insights of the researcher. Computer software programs are available that can assist in categorizing interview statements or counting key words, which may allow some forms of quantitative analysis.

6. Verify

In traditional research terms, this means determining **reliability** (how consistent the findings are), **validity** (whether the study really investigates what you intended to investigate), and **generalisability** (whether the findings apply to anyone outside of this particular program). In qualititative studies, one important way of verifying

findings or establishing validity is to actually take transcripts or analyzed results back to some of the interview participants, and ask them if this is really what they meant. Guba and Lincoln (1989) discuss the concepts of **confirmability, dependability, credibility and transferability** as alternative ways of ensuring quality of data in qualitative evaluations. For more in depth discussions of these important issues in qualitative research, readers are recommended to consult relevant chapters in Kvale (1996), Patton (1990), or Guba and Lincoln (1989).

7. Report

If the evaluation report is to effectively communicate findings, it must a) be in a form that meets some accepted scientific criteria, b) meet ethical standards such as confidentiality and respect, and c) be readable and usable for its intended audiences. In some cases, different reports may be needed for different audiences. An appropriate balance needs to be found between including endless quotations that will bore the reader and just quoting a few entertaining stories that happened to appeal to the researcher.

- Ethical Issues in Qualitative Interviewing

The very personal, conversational nature of interview situations highlight many of the basic ethical issues of any research method (Patton, 1990). Among these issues are:

1. Confidentiality

Because respondents may be sharing very personal information, it is important to honestly assess how much confidentiality you can promise. Some kinds of disclosures (such as child abuse or threats to the safety of self or others) must be reported, and respondents need to know this from the start. Also consider how the confidentiality of individuals will be preserved when the data are analyzed and reported. Related issues include who has access to the data and who 'owns' it.

2. Informed consent

Most studies are covered by some kind of human subjects review process. This will usually require that respondents sign a permission form agreeing to participate, after being informed of potential risks and benefits. If children are involved, a parent or legal guardian must provide this permission.

3. Risk assessment

It is important to consider all potential risks and include them in the informed consent process. Even though 'just talking' may seem inherently harmless, people who participate in open-ended interviews may experience psychological stress, legal or political repercussions, or ostracism by peers or staff who believe that the participant has said unflattering things about them to the interviewer.

4. Promises

The issue here is what interview participants get in return for sharing their time and insights with you. Will they or their communities benefit in some way from the results of the study? If promises are made (such as copies of reports or monetary payments), those promises should always be kept.

5. Interviewer mental health

Interviewing experiences can be intense interpersonal experiences. Just as participants may experience psychological stress from disclosing more than intended or being reminded of painful experiences, interviewers may be overwhelmed by the sensitive nature of what is seen or heard, especially in home- or field-based interviews. Some form of debriefing after the interview may be necessary. Interviewers should always know who to go to if they need advice or consultation on handling practical or emotional issues that arise from an interview.

3.3.2 Diaries

- What is a diary?

A diary is "a document created by an individual who has maintained a regular, personal, and contemporaneous record" (Alaszewski, 2006). Diary studies have roots in multiple disciplines. Biographers, historians, and literacy scholars have long considered diary documents to be of major importance for telling history. Sociologists employ diaries to construct pictures of social reality from the actor's perspective.

- Use of diaries in HCI

The use of diaries in HCI seems to be influenced by psychology. However, variations on the technique have some influences from various disciplines such as Health and Medicine, education, anthropology, and architecture. HCI researchers use diaries to collect data to be used in system development from a user-centred perspective (Czerwinski et al., 2004; Palen, Salzman, & Youngs, 2000; Rieman, 1993). Diaries provide a record of what users did, when they did it, and when they thought about their interactions with the technology. For example, Norman (1981) and Sellen (1994) used diaries in their human error work. Rieman (1993) presents the paper diary study method as a middle-ground solution to the opposing limitations of laboratory studies and field studies. Participants are asked to record particular activities as they occur on a paper diary.

The diaries can be highly structured, with specific pre-defined categories of activities to be checked off and later counted, such as the number of incoming phone calls over the course of a work day (Chin et al., 1992). They can also be unstructured, with spaces for recording, time-stamping, and describing activity, for example, in Adler et al. (1998). Activities of interest could be either seemingly mundane or exceptional; they could occur frequently or rarely. Ultimately, diary

design is highly research-specific. For example, Barry Brown and his colleagues (2000) from Hewlett Packard collected diaries from 22 people to examine when, how, and why they capture different types of information such as notes, marks on paper, scenes, sounds, moving images, etc. The participants were each given a small handheld camera and told to take a picture every time they captured information in any form.

Implementation of diary studies often requires participants to frequently, and even daily, discuss diary entries with the investigator (Rieman, 1993). Frequent investigator involvement, especially initially also ensures that participants understand the scope and descriptive depth needed for the diary entries. One of the challenges in diary studies, in fact, is convincing participants that seemingly mundane and low-level activities really are of research interest. Calibration of diary entries with investigators is necessary for garnering the type of data required (Palen, Salzman, & Youngs, 2000). Another challenge is that there is declining dedication to diary entry. Investigator involvement helps keep interest high and reminds participants of the importance of the diary in data collection.

Various forms of diaries that exist reflect a changing social context, for example, varying from the intimate journal to the interactive weblog (Hydegård, 2006). The diaries as a research tool holds great promise for the study of information behaviour as it tends to capture rich data on participants' actions and interactions, their thoughts, feelings, and reflections that may be otherwise difficult to get or not easy to observe (Toms et al., 2002; Wang, 1999; Elliot, 1997).

- Advantages and disadvantages of diaries

A key advantage of the diary method is the short term between event occurrence and recording, therefore, less subject to memory lapses and retrospective messaging, as may be the case with the interviews (Hyldegård, 2006). In this way, the diary may act as a surrogate for direct observation of the subjects (Wildemuth,

2002) and enable the researcher to understand the interplay between person and environment as perceived by the diary keeper (Launsø & Rieper,2005 as translated by Hydegård (2006)). In addition, Rieman (1993) suggests that the diary method helps bridge the gap between the naturalistic paradigm (observations of entities in the field) and the positivistic paradigm (studying entities in a controlled laboratory) by providing registrations of the field that may be used to guide further study in the laboratory.

Nevertheless, various constraints to the diary method also exist. Filling out a diary is generally tedious and time-consuming activity (Rieman, 1993; Wang, 1999), therefore, the diary period should be limited, for example, to no more than two weeks (Rieman, 1993)[13]. The diary too should be easy to use and to handle to minimise the risk of delay between event and recording. Diaries also rest heavily on participant cooperation to succeed. Over time participants may become sensitive to the process and modify their behaviour, for example, by recording more content initially which tails off towards the end of the diary period (Verbrugge, 1980; Corti, 1993).

3.3.3 Intention of conducting analysis

For research analysis, I would use data gathered from diaries and interviews. However, the observations based on friendship help me understand the findings better. Chapter 5 will discuss how observations in a friendship can be used for data analysis.

[13] The diary period should, however, be long enough to capture the behaviour or events of interest.

3.4 Friendship

There are several factors that may contribute towards the forming of personal relationships between two people. One possible factor could be gender issues. Since I am a female researcher studying a female subject, I would like to understand how gender affects the forming of personal relationship.

The following discusses some possible reasons for female friendship.

3.4.1 Female Friendship

Friendship became a topic of academic study in 1990s and there have been discussions of, among other things, what behaviours and feelings constitute friendship. The term friend denotes "something about the quality of the relationship you have with that person and is not just a categorical label" (Allan, 1989). A wide range of relationships may be subsumed under the label "friendship", different women may experience friendship in very different ways, and friendships are inevitably dynamic relationships (Blieszner, 1994). Blieszner (1994) identifies the following as some important aspects of friendship: perceptions that friends share one's values and interests and possess desirable personality traits; liking and trusting; self-disclosure and joint activities; provision of support and advice, and companionship. Marks' (1994) discussion of "workplace intimacy" also notes the presence of self-disclosure and very personal talk, not just "chit-chat"; shared recreational activities, and created rituals (e.g., birthday celebrations).

When a woman is studying another woman, a relationship between the subject and object of study can be easily made visible (Acker et al., 1983). Westkott (1979) says, "Women studying women reveals the complex way in which women as objects of knowledge reflect back upon women as subjects of knowledge. Knowledge of the

other and knowledge of the self are mutually informing because self and other share a common condition of being women".

In studying women, Acker and her colleagues (1983) encouraged their female participants to take the lead in the interviews and let them decide what to talk about. Woodward and Chisholm (1981) who used more structured interviews found that their strategy enlarged the gap which had already existed between them and their subjects.

The research process becomes a dialogue between the researcher and the researched, an effort to explore and clarify the topic under discussion, to clarify and expand understandings; both are assumed to be individuals who reflect upon their experience and who can communicate those reflections. Acker et al., (1983) argues that it is inherent in the situation; neither the subjectivity of the researcher nor the subjectivity of the researched can be eliminated in the process.

Because of the exploratory study, Acker and her colleagues realised that their relationship was defined as something which existed beyond the limits of the interview situations. They formed friendships with many women in their study. For example, they received hospitality from the participants, met their husbands, children, and friends, and even helped one woman to lessen her worries. They admitted that although their lives were different from most of women in the study, they did share a sense of uneasiness, dilemmas, and contradictions as well as willingness to acknowledge them. Acker and her colleagues even showed their written material to women they wrote about. They did not, however, do this with every woman in the study, for example, women who might get upset by their interpretations. Their solution was not to include these women as active participants in the analysis of their study. They posit that researcher's interpretation of the subject's life can be radically different from the subject's own view. This thus can raise an ethical issue, but, they believed that the solution lies in

accepting the dilemmas and maintaining an awareness of "when and why we are not able to make the research process a true dialogue, thus, giving full legitimacy to the subjectivity of the other as well as to our own" (Acker et al., 1983).

Some female researchers have recognised the value of collaboration, networking, support, and encouragement between women at work. However, Stanley (1992) has pointed out that "friend is just one of the titles or glosses which we use as simple ways of summarising a variety of different kinds of relationships". Cotterill (1992) notes that there may be a need to distinguish between "friendship" and "friendliness" because one is not necessarily "friends" with everyone to whom she has a friendly relationship. Holliday and her colleagues (1993) argue that "those who are friendly share connectedness at a surface level, but continue to overtly manage the self and emotions. Within the concept of friendship lies a greater sense of empathy which is not always visible to others" (pp. 187-188).

O'Connor (1992) argues that the physical and social setting is important; that the environment can influence the initiation and maintenance of women's friendships. Many studies (Green et al., 1990; Griffin, 1985; Sharpe, 1984; all cited in O'Connor, 1992) have found that women's friendships in the workplace are an in important and very real aspect of their work situations.

Andrew and Montague (1999) who explored their friendship at their workplace argue that the elements of female work-based friendship are not confined to work-based activities only; more important to these women are "shared talk, shared worlds, and most valued of all, shared laughter" (Andrew and Montague, 1999). In other words, they have fun working together.

Orbach and Eichenbaum (1994) have documented how friendship can give rise to negative emotions such as anger, envy, competition, guilt, as well as positive ones, and that they can be experienced very intensely, cause great distress, and can be

difficult to confront. Both close friendships and work collaborations can be disrupted or even destroyed. Andrew and Montague (1999) who studied friendship at workplace warn that if the friendship spans both 'public' (work) and 'private' (e.g. home), the risks may be greater. The boundaries become blurred. Cotterill (1992) notes that one indicator of friendship is having someone to confide in and knowing that person will listen sympathetically to what we want to say. This is important in a friendship. However, as a colleague, we both have shared and different experiences, backgrounds, academic approaches. We may see things in different ways or may even, on occasion, disagree fundamentally about policies and practice like in the Andrew & Montague's case (1999). This may give rise to feelings of hurt, or even betrayal. Such feelings are difficult enough for any colleagues to deal with, and may be even more painful for friends. Such emotions may not be confined to 'serious' issues; they can be prompted by such apparently trivial matters as who is invited for coffee or included in a discussion. Although they seem trivial, such occurrences may be interpreted as having a deeper significance (Andrew & Montague, 1999).

To conclude, females tend to celebrate "feeling, belief, and experientially based knowledge", which draw upon such traditionally feminine capacities as intuition, empathy, and relationship (Stanley & Wise, 1983). In fact, many female researchers consider empathy, connection, and concern to be women's special strengths and "subjects" can be full collaborators in the feminist research (Klein, 1983; Stanley & Wise, 1983). Although female and feminist are inseparable, doing feminist research is not the main focus. Rather, it is about how some of the feminist elements have influenced the researcher in conducting her research.

3.6 Literature and My Research

Diagram on the next page summarises how previous studies contributed understanding towards this research and what this research has produced.

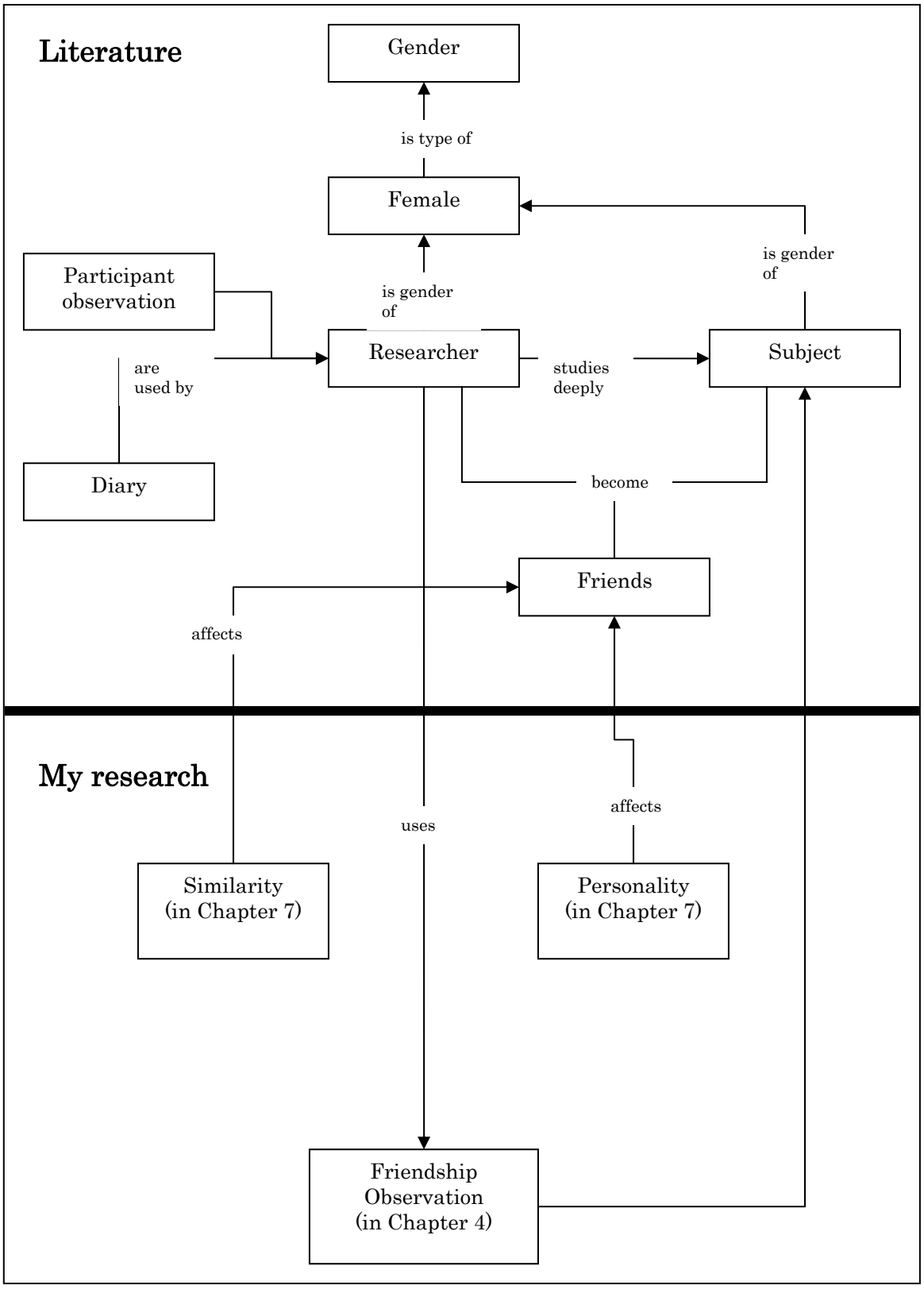


Figure 4. Diagram that shows how previous studies added understanding towards the research.

3.7 Conclusion

This chapter provided some understanding of certain data collection techniques: participant observation, diaries, and interviews, that could be beneficial to a study of a single person.

An in-depth study of a person may affect the relationship between a researcher and a subject. From the literature, gender can be a factor that contributes to such a relationship.

This thesis will show that beside gender, similarities and personalities also contribute towards the formation of a friendship. Friendship can offer benefits to HCI in general. Chapters 6, 7, and 8 will discuss the benefits of friendship in various formats. Friendship can also bring some potential risks to the study as emphasised in Chapters 5 and 8.

Chapter 4

This chapter highlights the following:

- Use of mobile phone can be for business, social, and psychological reasons.

- Many studies focus on young people and gendered use of mobile phone and text messaging.

- Studying an individual user helps understand her unique use of mobile phone.

Chapter 4

Understanding the use of mobile phone in everyday life

4.1 Introduction

Mobile telephone use has proliferated in recent years. A report published by Ofcom (the Office of Communications, the independent regulator and competition authority for the UK communications industries) in March 2006 stated that 82% of UK adults owned mobile phones. With the spread of "anywhere, anytime" communication infrastructures, comes increased convenience, better access to information and streamlined business processes. It is no longer unusual to see people using mobile phones in a variety of contexts. Use is so frequent and common in some places that people are regularly and formally reminded to turn off mobile phones in movie theatres, at public performances, and in restaurants to avoid negative social repercussions (Kellow, 1999).

This chapter in general discusses how mobile phone affects people's lives both socially and psychologically. The discussion, in particular, highlights how gender affects the use of mobile phone and text messaging.

My research is about how an individual uses her mobile phone. Although the previous studies help us understand how a woman might use her mobile phone, this research, in particular, helps us understand her specific or innovative use of mobile phone. This study, interestingly, focuses on a mother. There is evidence that more and more mothers use mobile phones, however, little studies in HCI have been done on this user group. Chapter 6 will discuss how this single mother uses her mobile phone and text messaging, and how this study can help inform design decisions for a prototype called 'Personal Motivator' which will be discussed in Chapter 7.

4.2 The influence of mobile phone in the everyday life

Norman explains that technologies become more adapted to user's needs as the technology matures (Norman, 1998); we are certainly witnessing that process with the mobile phone and the transition is taking place at an astonishing rate. It is no longer merely a tool, but a cool accessory, a companion, an extension of self that somehow is seen to express what the owner is like (Ling, 2004). It is no accident that the Finnish word for mobile is 'kännykkäs' which is derived from käsi meaning hand and thus stressing the idea of the mobile as an extension of self (Räty, 2000). Mobiles now come with skins that turn them into funky accessories or sober work tools as the user's mood might dictate (Norman, 2004 and Ling, 2004). However, the mobile is not a piece of technology that is even in its adoption and appeal but seems to have infiltrated into the essence of the cultures of the societies that have embraced it. Finnish sociologists have already commented at length on the change it seems to have brought about to Finnish culture with one Finnish sociologist commenting that mobile phones are owned and used enthusiastically by the

normally silent and taciturn Finns whose culture hitherto excluded small talk (Puro, 2002).

4.2.1 In the public spaces

Cooper (2002) states, "The use of the mobile in certain public spaces makes the relation of private and public slightly different" (p. 22). With mobile phones certain kinds of public space have been intruded. As a result, the distinction between private and public has been blurred. People in public space are now unexpectedly exposed to one side of a two-party private interaction, which can be frustrating with speculations about the missing side of the interaction (Cooper, 2002; Plant, 2001). Fortunati (2002) also notes that the mobile phone "favors the progressive encroachment of intimacy in the public sphere and of extraneousness in the private sphere" (p. 49). Cooper (2002) further states that the blurring distinction does not occur only between private and public spaces, but also between remote and distant, and between work and leisure. He suggests that we think of mobile phones as an indiscrete technology, a technology which has "the capacity to blur distinctions between ostensibly discrete domains and categories" (p. 24).

4.2.2 For work purposes

Palen and his colleagues (2001) note that there is difference between the initial intention and the actual nature of mobile phone use. They said that people initially adopted mobile phones for safety or security and "business" or job-related reasons.

In regard to the use of mobile phones for business and job-related issues, Laurier (2002) describes "nomadic workers" who use mobile phones in their car, throughout the day, for conducting business from the road—storing messages, briefing themselves with Post-it Notes stuck to the middle of the steering wheel, and preparing themselves for business meetings. Kopomaa (2000) and Gant & Kiesler

(2001) note that mobile phones are blurring the boundary between work and private life.

4.2.3 Use by young people

In Europe and Asia where mobile phones are much more prevalent than in the US, young people have been the driving force in adopting the new communication device. IPPR (Institute for Public Policy Research) reported that 80% of 12-15 year olds in the UK own mobile phones (IPPR, 2008). Wilska (2003) found that 54% of her respondents' parents paid all or at least most of their children's mobile bills. Therefore, just under half of the 16- to 20-year-olds had to fund their mobiles themselves. Coogan and Kangas (2001) note that families are not necessarily passive payers of accrued mobile costs, and the youngsters are often given the responsibility of managing their bills.

Taylor and Harper (2001) note that young people use mobile phones, especially their text-messaging feature, as forms of gifts that are "exchanged in performances that have specific meanings in young people's daily lives and are played out with the intent to cement social relationships" (Taylor & Harper, 2001).

Ling and Yttri (1999), studying particularly teenage mobile phone users through a series of focus group interviews, indicate the adoption of cell phones resulted in new forms of interaction called "micro-coordination and hyper-coordination." Micro-coordination refers to the use of cell phones by social groups to coordinate their meeting time and/or place as the need arises. Hyper-coordination goes beyond the simple time/place coordination and includes emotional and social communication among group members and development of group norms for appropriate self-presentation.

4.3 Psychological and social impacts of mobile phones

Palen et al. (2001) suggest that the nature of use of mobile phone depends on a range of life factors including:

- The mobility of one's profession and/or dedicated interests
- The availability of other communications media in locations of work or other central activities
- The number of roles one assumes professionally and personally
- The degree of integration one has across those roles
- The degree of responsibility one has for and to other people living in the home (or other primary relationships)

However, nearly all subjects in their study reported that the use of their mobile phones for sociable interactions had grown to become very important.

Literature has shown that benefits of mobile phone usage could be described as more psychological and social than technical or practical. For example, Leung and Wei (2000), list seven factors of gratification sought through mobile phone ownership: fashion/status, affection/sociability, relaxation, mobility, immediate access, instrumentality and reassurance. Additionally, Aoki and Downes' (2003) research with American college students found that the main reasons for purchasing a mobile to be for safety (when driving at night), for cost effectiveness, for instant information (e.g., phone numbers), for social interaction with friends and family, and for privacy.

James E. Katz, a prominent US researcher studying the social aspects of mobile communication, explored in 1997 the possible effects of wireless communication upon people's lives. In examining the topic, he identified several levels of effects of such a technology: namely "first-order effects," direct effects that are immediately perceived by users; "second-order effects," indirect effects that are "experiences or

feelings that people have or may observe in others" (Katz, 1997); and "third-order effects," the least direct effects that are observed not by users of the technology but by outside observers who study the effects of the technology upon the society in general. Katz listed uncertainty reduction, personal security, and personal efficiency, as the first-order effects of wireless communications on personal lives; tighter coupling of domestic production, information immediacy, and contactability as the second-order effects; and social interaction, social control, and innovative uses or unanticipated usage as the third-order effects.

4.3.1 Use of mobile phone

- As a communication tool

Mobile phones also make it possible for anybody to be reached at any time, in any place. This feature seems to pose ambivalent feelings. On the one hand, the devices facilitate communication among close circles of friends, family, and businesses. On the other hand, they can be considered as technologies of "surveillance," allowing people to be monitored (Green, 2002). Green suggests "the practices of mutual monitoring via information and communication technologies are shifting in ways unaccounted for in many contemporary theories of 'surveillance' " (p. 42).

Some of the benefits of mobile phone ownership are more practical than fundamental or central but are certainly not without significance. For example, once purchased the non-fixed mobile phone can take and make calls at any time and any place (Plant, 2000) whilst loosening the structures that once regulated individuals' lives as well as enhancing individual mobility (Kopomaa, 2002) and social efficiency (Katz and Aakhus, 2002). Additionally, the range of phone-features for the mobile, and the payment methods, offer more choice; and the competition between hand-set manufacturers and between service providers seem likely to maintain these options. Thus, convenience, mobility and choice are terms that characterise many of the factors in this area of benefit.

- As a 'keep-in-touch' tool

"Keeping in touch" is a frequently mentioned benefit (e.g., Fox, 2001) of the mobile phone although such a phrase can offer multiple connotations. Situations under this heading can range from those where it is simply very helpful to be able to speak to someone else who may not otherwise be contactable, e.g. on a bus, whilst in the middle of shopping etc—to the more general benefit of keeping in touch with family and friends. For example, Aoki & Downes' (2003) respondents claim that although they did not necessarily buy their mobile for social interaction, they do now value the device for staying in contact with friends. They did, however, admit that staying in contact with family whilst at college was a reason for purchasing the mobile as was "micro-coordination" whereby they could use the phone for time management and tighter social organisation.

A benefit that is seen by many owners from the start, and by others later, is not simply that of "keeping in touch" when trains are delayed, etc. nor even of saying a brief hello to one's parents or offspring, but that of more extended "gossiping" to friends and family. The role of "gossip" is itself a wide topic and largely outside the scope of the present paper but Fox (2001) comments on some of the recent literature with particular relevance to mobile phone usage. She summarises her article as follows:

"Gossip is not a trivial pastime; it is essential to human social, psychological and even physical well-being. The mobile phone, by facilitating therapeutic gossip in an alienating and fragmented modern world, has become a vital 'social lifeline', helping us to recreate the more natural communication patterns of pre-industrial times" (Fox, 2001).

Gossip has been defined as "the process of informally communicating value-laden information about members of a social setting" (Noon & Delbridge,1993). Seen in this light—rather than the more popular usage of the term as largely involving

negative or disparaging comments about others—gossip comprises the major part of human informal social communication and, therefore not surprisingly, the major part of mobile communication. Fox (2001) finds that most of the existing research on gossip "highlights the positive social and psychological functions of gossip: facilitating relationship-building, group bonding, clarification of social position and status, reinforcing shared values, conflict resolution and so on" (Fox, 2001).

- As an element of freedom

Thus, the flexibility of use that a mobile phone affords could validly be described as a practical benefit but there is no doubt that the freedom that this provides also has an important psychological component. This might be true for any owner but it probably has special significance for those who might be regarded, or would regard themselves, as dependant on others, or vulnerable, e.g. children and young people, the sick, the disabled, the elderly. Parents, too, might see the mobile phone as providing an element of freedom, allowing them to undertake or enjoy activities away from their children that—without the knowledge that one touch of a keypad was all that separated them—they otherwise would be reluctant to undertake. Indeed, Wilska (2003) notes how children as young as seven are being bought mobile phones, "usually intended as a 'lifeline' even if the children themselves see it mainly as a fancy toy" (Wilska, 2003: p. 449). Therefore, parents can allow their children more freedom without physical control and still have a clear conscience (Wilska, 2003). From this perspective, the mobile phones have been deemed as a technology of surveillance (Green, 2002).

However, according to Ling, the mobile phone altered the power relations between the parents of his respondents and the 13- to 19-year-olds he researched in Norway, as the teenagers could develop and maintain social contacts outside of parents' control (Ling, 2000). Indeed, according to Wilska, the mobile has reduced the possibility of parents being able to control their youngsters' communication. Children's conversations can now be more private and parents do not even

necessarily know the friends of their children any more. Wilska (2003) also comments on how young people can embrace the freedom that the mobile phone provides. Therefore, a sense of freedom, even "emancipation", has particular resonance for the use of the mobile phone by children and young people (Ling, 2000). The means of communication with others is literally in their hands as is their control over their own destiny (Katz & Aakhus, 2002). They can choose when, from where and to whom they phone. No permission needs to be sought, any overhearing by parents can readily be avoided and censorship by parents or others is virtually impossible (see also Livingstone & Bovil, 1999).

- As an emergency tool

A benefit, therefore, that is frequently mentioned (e.g., Katz, 1997) as a reason for purchasing a mobile phone is its use in emergencies, where immediate contact with another party (e.g., family, emergency services) is vital. Such situations can range from major crises posed by a road accident, heart attack or threatened violence to a more mundane emergency such as being stranded after missing the last bus or train home. This benefit will be of particular importance to the vulnerable but clearly it has universal relevance, too.

- As a safety tool

One other advantage of the mobile phone is that it gives a sense of confidence. Clearly, this would be the case for those who may feel themselves to be vulnerable and also for the families of such individuals who may also feel confident in the knowledge, for example, that assistance can be summoned at once. However, in addition to those with special vulnerabilities many mobile phone owners in general report that they feel more self-confident with their mobile phone close to hand (Fox, 2001).

- As a fashion statement

Mobile phones, of course, are also now a fashion accessory or modish acquisition in the same category as the latest training shoes, school bags etc. for children, or a DVD and portable computer for adults. Like these and other accessories mobile phones are seen at least by some as bestowing status or confirming group identity. Wilska (2003) claims the mobile to be "addictive", "trendy" and "impulsive" and notes how young people in today's society are more in-tune with their "own style" in comparison to previous generations. The importance of logos and brands within their lives is reflected in their consumer styles.

One interesting potential benefit of mobile phone usage that has emerged in the literature, albeit at the speculative level, has been the suggestion that this new phase of consumption could erode cigarette smoking. Indeed Charlton and Bates (2000) pointed to the alleged correlation between the decline in teenage smoking and the rise in mobile phone ownership. Thus, "Mobile phones could be filling a gap in the growing up process that has sometimes been taken by smoking… You see young people holding a phone, as though they were about to use it—it's something in their hand—and there are similarities to the rituals of smoking". If this is the case, then it is an economic fact that money spent on mobile phones leaves less, if any, to spend on cigarettes.

4.4 Gender differences

While both genders are rather similar in the quantitative intensity of usage, they still differ significantly in the qualitative patterns and purposes of use. In fact men and women have always been found to maintain quite different attitudes toward the phone and to give it a different place in their whole "communicative economy" (Rakow, 1992; Moyal, 1989).

4.4.1 Gendered use of mobile phone

In a very early study of mobile phone usage, Rakov and Navarro hypothesised that the mobile telephone was reinforcing conventional gender patterns, e. g. by emphasizing the role of the woman as an "accessible nurturer" and a person in need of male protection (Rakov & Navarro, 1993).

The Finnish sociologist, Roos (1993), suggests that some people want to be constantly available since this fulfils an emotional and a practical need. The mobile phone allows them to do this although there appears to be a difference between male and female attitudes towards the mobile phone. Women see it more as a means of extending responsibility and care for loved ones. Men view it more as a business tool (Puro, 2002).

Typically, men are stressing instrumental phone uses as,

"….more amongst boys than girls –, the mobile phone is seen as an instrument helping to organise life, to arrange dates and contacts, actions, meetings, etc., thus aiding in growing in maturity and autonomy, both necessary for the adult stage." (Lorente, 2002)

Women, on the other hand, tend to use the phone more as medium for personal and emotional exchange (Lohan, 1997; Lorente, 2002):

"Men appear to have a different concept of communication. In contrast to women, they give an "objective reason" for the "usefulness" of their call. Men maintain that they mainly arrange appointments, exchange short snippets of news or information and discuss defined questions or problems. Women admit to calling "for the sake of it", to speak with one another and to exchange general news. The shorter duration of men's calls seems to be connected with their different understanding of communication and its embodiment in the telephone" (Lange, 1993).

More recent studies have demonstrated that women use the mobile more for lengthy talks about personal and emotional matters, while males make shorter calls dedicated more frequently for instrumental purposes (e. g. for coordinating meeting times and places) (Kunz, 2003; Mante & Piris, 2002). Females are more involved in gossip, because also men tend to gossip primarily with women, not with other males (Fox, 2004)

Such findings are in accordance with the more general socio-psychological regularity that girls are more prone to disclose personal information and emotions and to discuss their subjective tastes and interests with others than boys (Buhrmester & Prager, 1995; Jourard, 1971; Stern 2004), and that they are more disposed to talk about their anxieties (O'Neil et al., 1976). They also converge on the regularity that women have more sophisticated communication and conversation skills, they are more apt to initiate new topics (Fishman, 1978) of conversation and to adapt when topics are changed (Sattel, 1976).

It has also been found that such gender gaps widen during adolescence because girls increase their emotional expressiveness, while boys develop norms that restrict such personalised articulations (Polce-Lynch et al., 1998).

In this view, males see the mobile phone primarily as an empowering technology that mainly increases the independence from, not the connectedness to the social environment:

"Its ownership, but not necessarily its use for social interaction, provides a secure foothold. It increases ones' potential for independent action and, when confronted with the unexpected such as coming upon a car accident along the road, the mobile telephone allows one to aid in setting things right. There is also the symbolic value of being involved with the newest technologies as being a sign of one's modernity." (Ling, 1999a).

Boys are also more prone to explore the ever expanding new functional features of current mobile phones (e. g. for gaming, hooking up to the Internet etc.), while girls use a narrower scope of (exclusively communicational) functions (Höflich & Rössler, 2002). Therefore, boys report more frequently that they have "fun" in using the phone (Höflich &Rössler 2002). These German findings conform with the results of Potts' Oakland study which demonstrated that males make more use of the more expanded Internet functions of the mobile, while women restrict their usage to more conventional (communicative) functions (Potts, 2004). Similarly, Skog (2002) observed that girls valued social functionality of the mobile phone higher than boys, who on the other hand stressed technical functionality and non-interactive uses like gaming (see also Mante & Piris, 2002).

As it is well known, women have a central role in maintaining any kind of social network) especially among family members and kin (Wellman, 1992; Ling, 2001a; Ling, 1998). Therefore, the networks of women are often larger and more complex that those of men (Cochran et al., 1993; Moore, 1990).

Women are also more prone to keep connected to their family - what should result in a higher preference for family members (and other highly familiar individuals) as phone partners.

As Stern (2004) says, "Possibly, boys at adolescence make greater effort in their self-presentation to appear autonomous and free from their families, whereas girls worry more about appearing connected, both to families and increasingly at adolescence, to romantic partners." (Stern 2004)

Thus, it is to be expected that phone adoption by girls is more heavily determined by parental status characteristics, preferences and behaviour than in the case of boys:

"The mobile amongst the former would seem to be brought in more frequently through the role of parents, as a safety means for controlling the girls' autonomy. In

the case of boys, however, adopting the mobile would seem more linked to an autonomous process with this telephone being at once an item for achieving masculine identity and a symbol of modernity." (Lobet-Maris & Henin, 2002).

4.4.2 Gendered use of text messaging

Ling (2003) suggests that it is women, particularly teenage and young adult women that have taken the lead in SMS use. In Ling's survey, young females sent an average of seven texts per day, 40% more than males in the same age group. Reid and Reid (2003) also found that heavy texters – specifically those that preferred texting to talking on their mobiles – were far more likely to be younger and female. In fact, only 39.5% of the 396 male respondents in their survey reported a preference for texting, compared with 49.1% of the 676 female respondents. Furthermore, 51.3% of females classified as texters were 21 years old or younger, compared to 43.7 per cent of males in this category.

Several studies have shown that the meaning and use of the mobile phone changes with age. The pre-occupation with SMS messaging is especially high in the early teens. After 16, the adolescent shows a more 'grown-up' pattern of mobile phone use, in which SMS becomes less and face-to-face more important (Kaseniemi & Rautiainen, 2002). When they are around 20, voice calls have replaced SMS to a significant degree (Ling, 2001a; Potts, 2004).

However, Rich Ling's studies demonstrate that adolescent females as well as adult women up to 40 are more active in sending SMS messages than males. Eldridge and Grinter (2001) have found that girls aged 15 send on the average of 3.3 SMS per day, boys of the same age only 2.5. (Eldridge & Grinter, 2001).

In addition, Kaseniemi & Rautiainen (2002) observed that girls tend to write longer texts: they more often used all 160 characters of an SMS and filled it with references and social gossip, while boys often wrote messages of 40-50 characters

with “plain language”. On the other hand, young and middle-aged males are most audio callers (Ling, 2001a: 10).

Ling and Yttri (2002) describe a joint examination, interpretation and sharing of messages among female users (particularly teens) that may be explained by *attributes of the social networks* of female versus male users. The channel richness, interactivity (asynchronous) and format of text messaging services may be particularly well suited for maintaining female users' social networks.

For a significant number of users, sending a text message may be more important for building and maintaining social relationships than for coordinating practical arrangements (Ling & Yttri, 2002). Reid & Reid (2004) note that texting helps develop new relationships, adds something new to the existing relationships, and affects one’s social life more than the talkers.

4.5 Texting is “a girl thing”

What is it that makes texting “more of a girl thing”? Reid and Reid (2003) suggest that texting is predominantly concerned with friendship work. In Thurlow's (2003) study of undergraduate text messages, only about one-third of messages accomplished functional or practical goals – the remainder fulfilled a combination of friendship maintenance, romantic, and social functions associated with highly intimate and relational concerns. The study done by Reid and Reid (2003) also showed that heavy texters[14] establish small networks of text mates, with whom they exchange messages more or less continuously, engaging in extended text conversations consisting of multiple partners and multiple turns, even preferring this kind of contact over voice calls with their partners. As Thurlow (2003, p. 12)

[14] Texters are people who prefer texting to talking.

puts it, texting creates "a steady flow of banter … used … to maintain an atmosphere of intimacy and perpetual social contact. In this sense, text messaging is small talk *par excellence* – none of which is to say that it is either peripheral or unimportant".

SMS is therefore an important vehicle for establishing a sense of social connection to others, creating awareness moments in which people feel connected to each other, with or without the need to convey specific items of information (Nardi *et al.*, 2000). The fact that young women value this more than men is consistent with what is known about the kinds of relationships girls develop with same-sex friends from school age onwards – generally girls lean towards more intimate, person-to-person bonds than boys (Markovits *et al.*, 2001). Paradoxically, girls' same-sex friendships are also more unstable, shorter-lived, and generally more fragile than those of boys (Benenson and Christakos, 2003), and this creates intense pressures among girls to monitor and maintain their close friendships through regular personal contact. Among Thurlow's corpus of messages, texts that simply expressed positive feelings, establish a mood of sociability, or that offer apologies, support, thanks – all appeared to fulfil these important friendship maintenance functions.

Reid and Reid (2003) suggest that there is an existence of text circles – well-defined and close-knit groups of contacts with whom texters regularly, sometimes continuously, exchange messages. In their study, text circles did not appear to be particularly extensive – texters messaged about the same number of people on a regular basis as did "talkers" – but they had fewer contacts in their phonebooks, and proportionally more of these were mobile rather than landline numbers. They also engaged more frequently in extended text conversations, sending nearly twice as many messages in these conversations than talkers. Furthermore, texters were more likely to text a specific, well-defined group rather than many more diffuse groups of contacts, and more frequently participated in several simultaneous text conversations, findings which taken together reinforce the idea that texters share

interconnections within a close group of friends in perpetual SMS contact with one another.

It is said that strong gender differences are likely to lie behind these circles of contacts. Research on children and young adults has shown that boy's same-sex friendships are more interconnected and group-oriented than those of girls, who tend to form pairwise attachments with individual friends (Markovits *et al.*, 2001). Boys also tend also to focus their communications on more tribal, group-based activities, while girl's communications are more relationally-focused (Seeley *et al.*, 2003). The fact that boys' attachments are more group- and activity-based does not mean they are less close or intimate – instead it implies that while girls' social networks are networks of friendship pairs, boys' networks form coherent units with a stronger sense of group identity and fairly clear group boundaries and memberships.

These differences have profound implications for supporting SMS text circles. For boys, a presence service offering group-wide SMS would be capable of maintaining the clubby atmosphere of their "all for one, and one for all" network of attachments – a single, jocular text addressed to the whole group will be sufficient to maintain it as a coherent social unit. However, this will not do for girls' social networks. Girls typically build up high-maintenance networks of relatively independent one-to-one attachments, each of which needs to be separately monitored and cultivated through "friendship work" and regular social contact (Benenson and Christakos, 2003).

4.6 Study of mobile phone use in this research

The researchers have studied the effects of mobile phone use and found that: (1) there are intended and unintended uses of the technology; (2) mobile phones are forming particular subcultures among youths in many different countries; (3) the use of mobile phone is blurring the boundary between work and private life as well as the boundary between public and private space; (4) the mobile phone can make the user susceptible to social control by friends, family and businesses; and (5) there are differences between men and women in terms of how they perceive mobile phones and text messaging.

There is evidence that more women in 30-40s use mobile phones nowadays. A study commissioned by Verizon Wireless in 2002 reported that 87% of 30-40 year-old women surveyed said that text messaging would help them improve their personal and business communications. However, studies focusing on these women are still rare in HCI.

This study is focused on a mother: to understand how this particular user uses her mobile phone – her unique and/or innovative way of using mobile phone. Chapter 6 discusses KN's use of her mobile phone, both generally and individually.

Generally, KN uses her mobile phone for similar purposes as highlighted in the literature. However, studying her individually helps understand her unique use: she describes text messaging as 'her mini break' in her everyday routines and her mobile phone alarm is actually her 'time management tool'.

Experience from this research is reflected on the researcher: 1) studying a mobile phone user helps understand oneself better, for example, being a mother and a PhD student, one may face time management issues, i.e., it is hard to manage time effectively if we have many commitments in our lives and 2) empathetic understanding affects decisions on the design of an application. Chapter 7 will

discuss a prototype called 'Personal Motivator' which is developed based on empathy.

Chapter 5

This chapter highlights the following:

- To learn from a single person, it is suggested that the subject should be selected based on a sampling technique.

- Single person study inevitably affects the relationship between the researcher and the subject. This relationship, consequently, affects the study.

- Single person study reflects deeply on the researcher: it helps grow as a researcher and a designer.

Chapter 5

Doing Single Person Study: The Methodology

5.1 Introduction

This chapter discusses a study of a single person and the methodological issues surrounding it. The study begins with the selection of a subject. The subject is chosen because she is different from the rest of the participants. Chapter 1 has discussed this in detail. The subject is then studied in depth and over a period of three years. Due to the prolonged study, it inevitably affects the relationship between the researcher and the subject: they become friends. Chapter 7 will discuss how the in-depth study influences the relationship. Friendship has potential to offer benefits in the forms that will be described in chapters 6 and 7.

Personal relationship between the researcher and the subject indirectly affects the study. It affects how some of the data in the study are collected and therefore reported. Because of friendship, an observational technique called 'Friendship observation' emerges as part of doing research. This chapter will discuss how

friendship observation is done including how data are collected and reported and ways to increase the reliability of the data. Meanwhile, Chapter 7 will discuss how the friendship affects the validity of the study.

Studying a single person indirectly reflects deeply on me as a researcher and as a designer. In a way, studying a single person helps me develop some research and design skills as discussed at the end of this chapter.

5.2 Studying A Single Person

The methodology is actually divided into three phases: selecting a subject, studying the subject, and reporting the data.

5.2.1 Phase 1: Selecting a subject

5.2.1.1 Choose a subject – interesting and voluntary

If the purpose of the study is to help us learn, it is recommended that we should not randomly choose the subject.

Based on the information sampling, according to Flyvberg (2006) KN represents a deviant case. KN was chosen because the way she used her mobile phone was different from how the rest of the participants did. The findings were already discussed in Section 1.2 in Chapter 1.

Flyvberg (2006) argues that typical or average case is often not the richest in information and that extreme or atypical cases often reveal more information because they activate more basic mechanisms and more actors in the situation

studied. Hans Eysenck (1976) says that "sometimes we simply have to keep our eyes open and look at individual cases – not in the hope of proving anything, but rather in the hope of learning something!" (p.9).

When she was told that she would become the main subject for this research, she was surprised but at the same time, admitted feeling 'honoured' because she did not know that she meant a lot for this research.

As a mother doing a PhD, she undoubtedly had a busy life. However, she was still willing to participate because she was interested to know the outcome of the research. Nevertheless, she admitted that she was somehow under pressure because she felt responsible for the success of this study.

There was a high possibility that she might withdraw from the study. One possible reason was because it could be too much for her to handle. One way to handle this situation, as a researcher, I felt that it was important to have positive regard and learn to care for her so that she would feel appreciated and therefore would stay until the study was complete.

Chapter 8 which is focused on friendship will discuss the need for managing the relations with the subject.

5.2.2 Phase 2: Studying the subject

5.2.2.1 Deciding a research strategy

The primary purpose for studying the subject, KN, was to understand why she used her mobile phone the way she did. Most studies on the use of mobile phone employ qualitative techniques. For example, Sarker and Wells (2003) interviewed 26 university students. These interviews were carried out every week for a period of three weeks. Similarly, Nordli and Sørensen (2003) did in-depth interviews with 11 Norwegians. Some researchers use interviews as a method to help clarify points of interest raised in the observations such as Berg et al. (2002) and voice-mail diaries such as Palen et al. (2000). Other researchers might use a quantitative technique such as survey questionnaires (for example, The Australian Psychological Society (2004)).

Since I wanted to understand the relationship between the user and the mobile phone, I decided to use an exploratory study which would employ diary and interviews.

5.2.2.2 Collecting data

- Diary study

She was initially asked to record her activities with a tape, but rejected it because she said that she was not good with tape recording. Then she suggested that she could write a diary of the kind of activity she did with her mobile phone. She personally thought that she could express herself better through writing.

In HCI, diary studies are used to capture activities that occur using technology in the real environment. For the similar reason, KN was required to write her

activities with mobile phone on a paper diary for a period of seven consecutive days. Ideally, she had to record any activity as it occurred. But she was given some flexibility: she did not need to record the activity as it occurred everyday if she decided not to. She, however, should do it as soon as possible to avoid being forgetful if she had done it much later. Upon collecting her diary, she said that she really appreciated the flexibility given to her. She said that she felt less pressure.

A diary can be highly structured (e.g. Chin et al., 1992) or unstructured (e.g. Adler et al., 1998). In this research, KN was not told how she should write her diary. Therefore, it was entirely up to her to do it.

She came up with a rather comprehensive diary: she categorised her activity with mobile phone into Days and then detailed the Days category by classifying it into 'morning', 'afternoon', and 'evening' (see Appendix A for the Diary). Despite categorisation, her diary was still intimately written. She actually shared her feelings in the diary.

From the literature in Chapter 3, it is recommended that the researcher discuss the diary entry with the subject everyday. In my case, I did not do it as suggested because I trusted her that she would do it anyway. Doing a diary study for a week was already a big commitment for her. Checking on her everyday during the diary study period, therefore, would definitely add more burdens on her.

Upon analysing the diary, I realised that she often used her mobile phone for text messaging (refer to her diary in Appendix A). This contradicted to what she had said in the previous study - she said that she often used her mobile phone as an alarm (refer to Table 1 in Chapter 1). She did not really discuss how she used her mobile phone alarm in the diary. There were only two times she mentioned about using the mobile phone alarm - at the bedtime every night and on Day 2 where she explained how she used alarm as a time management tool (refer to Appendix A).

After reading her diary, I was curious to know more about three things: how she used the mobile phone alarm as time management, why she liked text messaging, and what other activity she might do with her mobile phone which she did not get to share it during her diary study. For this reason, I decided to ask her face-to-face.

- Interviews

Kvale (1996) suggests that interviews, at the most basic level, are conversations but with a purpose. In general, interview can be a valuable research method for exploring "data on understandings, opinions, what people remember doing, attitudes, feelings and the like, that people have in common" (Arksey and Knight, 1999). I used interviews in an exploratory manner for two reasons: (1) I wanted to investigate and understand three things: how she used her mobile phone alarm, why she liked text messaging, and what else she did with her mobile phone, and (2) from personal experience, I felt that a woman could better express herself through story telling.

We have a lot in common and share similar experiences, understanding, and beliefs: we are mothers doing PhDs struggling hard between family and study commitments. From the interviews, I could feel that she was really comfortable with me and therefore, felt free to tell her stories in her own way. Two reasons are possible for this feeling: I am familiar to her – she used to participate in my study and I am a woman. For me, it is important that she feels comfortable and trusts me. Many female researchers suggest that a closer relationship with female interviewees can produce a valid and meaningful account of women's experiences. The emphasis here is to acquire deep knowledge and authenticity (Gubrium and Holstein, 2002) of her experiences with mobile phone, and to gain her trust that I as the researcher would not exploit her for the sake of the study.

KN's responses to the questions in the interviews provided some quotations which became the main sources for the raw data, for example, "spice up my life", "I have another priority in my life", and "not everyone can do it". Patton (1986) notes that quotations "reveal the respondents' levels of emotion, the way in which they have organised the world, their thoughts about what is happening, their experiences, and their basic perceptions".

Although interviews were structured in the beginning (some questions were prepared for the interviews), they eventually became unstructured because the subsequent questions were 'spontaneously' asked in the interviews. This happened because I became interested in her answers and wanted to know more about them 'there and then'.

KN has participated in my studies: the first study of mobile phone use and the exploratory study of a single person. I realised that the need to get back to her for more data has indirectly given me more opportunities to know her better. One possible reason is her personality. I realised that I enjoyed her companionship. Furthermore, we have a lot in common and share similar experiences, understanding, and beliefs. Eventually, we became closer to each other. We became friends.

From the interviews, I learned that it is easier to get 'what' and 'how' questions answered than 'why' questions because people sometimes do not always understand certain behaviours that they do. For example, when asked about a reason for being dependent on the mobile phone alarm, she replied that she had many commitments and had to manage the house all by herself. Although the answer was true in one aspect, I did not really think that it was the only reason for her reliance on the mobile phone alarm. I believed there must be some other explanations to describe her dependency on her mobile phone alarm.

5.2.3 Phase 3: Analysing and reporting data

This section discusses how the different types of data are used in the analysis and how the data are reported.

Analysis is done based on sources that are gathered from the fieldnotes, personal emails, and friendship observation[15].

5.2.3.1 Use of fieldnotes

Main sources of data for the research are the diary study (Appendix A) and the interviews (Appendices B and C). The interviews were both done formally and informally. Figure 5 shows a questionnaire that records data in an interview, whereas Figure 6 shows a record of a telephone conversation.

5.2.3.2 Use of personal emails

As friendship grew, we happened to be frequently in touch with each other. We often talked over the phone, texted messages, and even emailed each other. Personal emails can help inform a reader implicitly about the sender. For example, some of her personal emails somehow helped me understand a type of person she was. In particular, the content of the email in Figure 7 recommends that the Muslims read the Surah, Yaasin, because this surah offers huge rewards to the readers. The content of the email in Figure 8, meanwhile, helps the readers ponder upon what we have done so far and what we can do to be a better person. Basically, the emails shown in Figures 7 and 8 implicitly indicate that she cared for her friends. Despite its potential benefit, there is a risk associated to the use of the

[15] To be discussed further in Section 5.2.3.3.

personal emails as a data gathering tool: the personal email may get deleted easily due to space problems.

Figure 5. An excerpt of the first interview of mobile phone use. Taken in April 2004. See Appendix H.

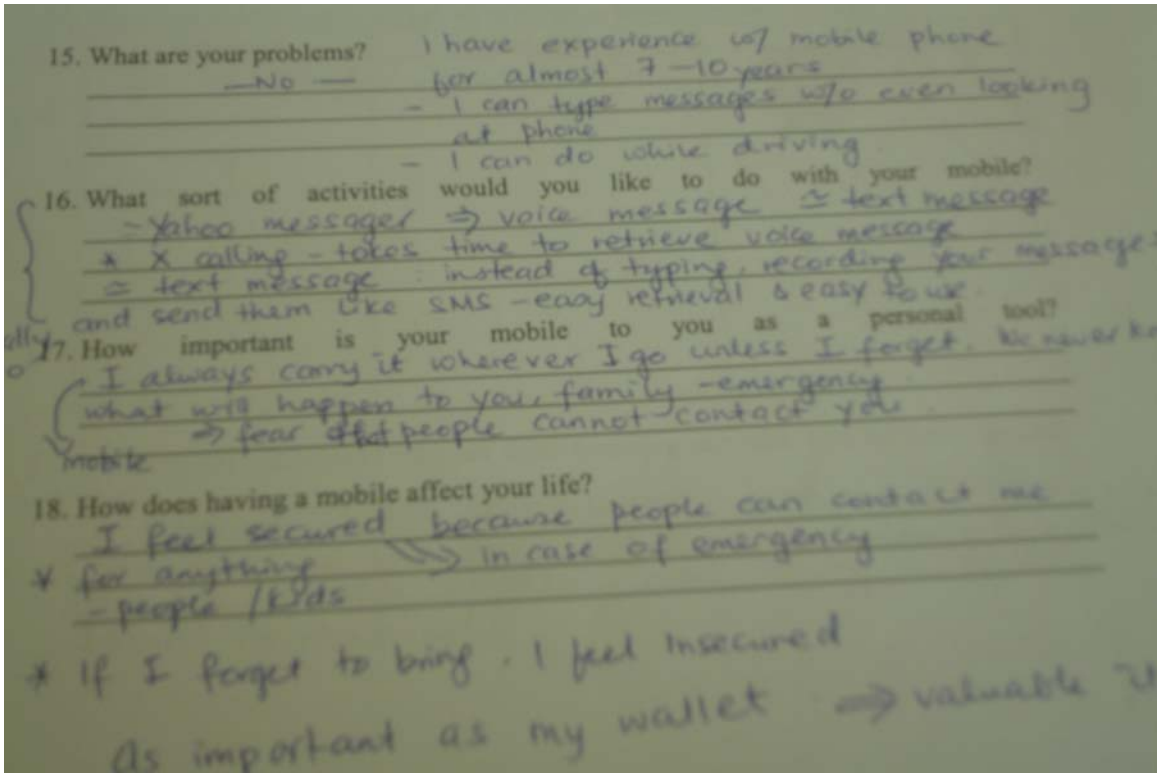


Figure 6. Handwritten notes taken during a telephone conversation in November 2004

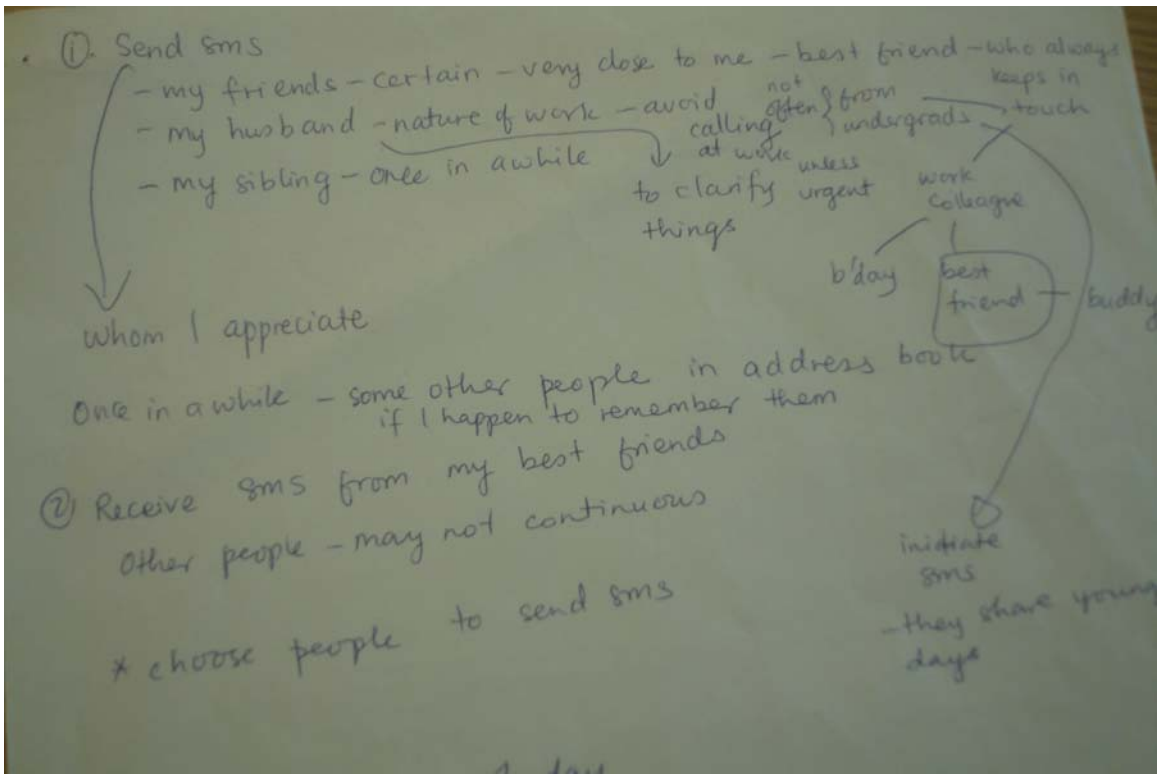


Figure 7. An excerpt of an email which was written in Malay language. It is about the secret of a verse, Surah Yasin, ayah no 58 from the Holy Quran.

Date: Thu, 8 Mar 2007 10:41:51 +0000 (GMT)

From: "Zarina Othman" <zothm@yahoo.co.uk> View Contact Details
Yahoo! DomainKeys has confirmed that this message was sent by yahoo.co.uk. Learn more

Subject: Fwd: Fw: rahsia surah yassin ayat ke 58...

To: "rina min" <rina161997@yahoo.co.uk>, "nitty" <n.kamarulzaman1@lancaster.ac.uk>, "linda hashim" <haslinda_74@yahoo.com>, "Saadiatul Ibrahim" <saadiatul@gmail.com>, "haris" <fharmy@yahoo.com>

RAHSIA SURAH YASSIN AYAT KE 58

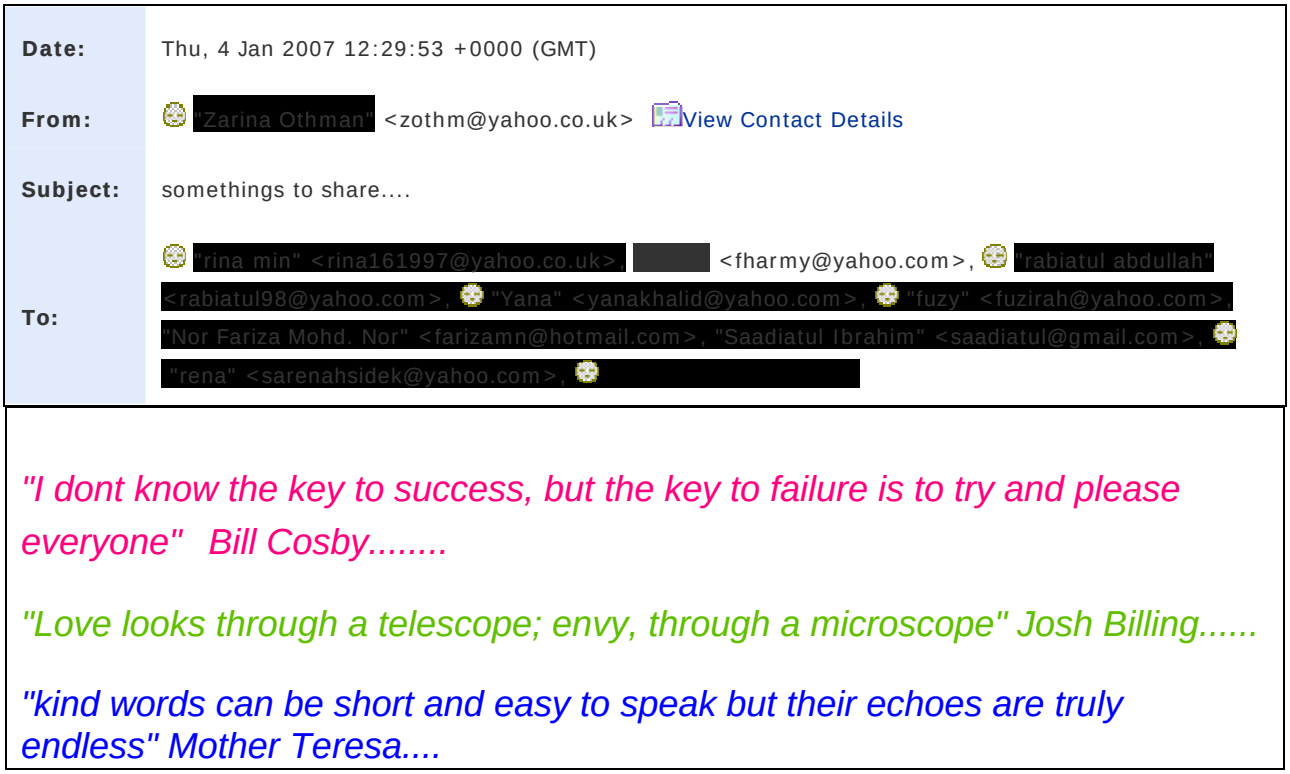
Barangsiapa yang membaca YAASIN sepenuhnya dan pada ayat ke 58 surah tersebut "SALAAMUN QAULAN MIN RABBIN RAHIM" diulang sebanyak 7 kali untuk 7 niat baikmu, Insya Allah dengan izin Yang Maha Esa dan Maha Kuasa, semua hajatmu akan dikabulkan.
Jika boleh niatkan sebegini:

1) YA-ALLAH YA-RAHIM, *ampunkan dosa-dosaku dan saudara-maraku*
2) YA-ALLAH YA-RAHMAN, *kurniakan aku isteri,suami, anak-anak yang soleh dan mencintai islam*
3) YA-ALLAH YA-RAZZAK, *kurniakan aku rezeki yang berkat,kerja yang baik dan berjaya didunia dan akhirat.*
4) YA-ALLAH YA-JABBAR, *makbulkan hajat penghantar maklumat yang aku dapat ini*
5) YA-ALLAH YA-MUTAQABBIR, *jauhkan aku dari sifat khianat dan munafiq dan miskin*
6) YA-ALLAH YA-WADUUD, *kurniakan aku dan seluruh umat Muhammad yang beriman kesihatan zahir batin*
7) YA-ALLAH YA-ZALJALA LIWAL IKRAM, *makbulkanlah semua hajatku, dan redhaikanlah aku.....*

AMINnnnn.

Sampaikan dakwah ini kepada sahabat anda seramai 7 orang atau lebih, tiada kerugian bahkan digalakkan. Ikhlaskanlah hatimu menyampaikan dakwah ini kerana Allah.
Dunia adalah pentas, akhirat tempatnya yang sebenar...

Figure 8. An email that shows some word phrases by famous people. As her friend, I am used to getting this sort of email from her.



Date: Thu, 4 Jan 2007 12:29:53 +0000 (GMT)

From: "Zarina Othman" <zothm@yahoo.co.uk> View Contact Details

Subject: somethings to share....

To: "rina min" <rina161997@yahoo.co.uk>, [redacted] <fharmy@yahoo.com>, "rabiatul abdullah" <rabiatul98@yahoo.com>, "Yana" <yanakhalid@yahoo.com>, "fuzy" <fuzirah@yahoo.com>, "Nor Fariza Mohd. Nor" <farizamn@hotmail.com>, "Saadiatul Ibrahim" <saadiatul@gmail.com>, "rena" <sarenahsidek@yahoo.com>, [redacted]

"I dont know the key to success, but the key to failure is to try and please everyone" Bill Cosby.....

"Love looks through a telescope; envy, through a microscope" Josh Billing.....

"kind words can be short and easy to speak but their echoes are truly endless" Mother Teresa....

In addition to fieldnotes and personal emails, observations based on our friendship are also used for the analysis purposes. These observations have helped me as a researcher understand better about her use of mobile phone. This observational technique known as 'Friendship observation' emerges as part of doing research due to our friendship.

5.2.3.2 Use of Friendship Observation

I am a part of the subject's culture. Studying her reflects upon myself: who I am, what I do, what I believe, etc. In other words, studying her makes me become more aware of the things that I often take for granted, for example, the sacrifice made by

my husband and children for me. Section 5.4 will discuss more on the reflection issues.

As her friend I may not need to get her permission in order to know her better, but, as a researcher, it was an obligatory to ask for her permission. However, I only obtained her consent verbally, not on a written statement. Perhaps this has to do with our friendship: we tend to do it more informally. For the research's sake, she gave me her consent. I told her that I might study her from time-to-time for my research. In this situation, the researcher plays dual roles: a friend and a researcher, which often overlap with each other, therefore making the boundary blurred. I had to be very careful when dealing with this matter. One common reason was that I had to guard myself from making personal judgment based on her behaviour and attitudes. The next section will discuss some possible ways to increase the reliability of the data.

The data gathered from this observational technique is often very personal: my understanding about her personal characters and her everyday life. Chapter 6 will discuss her use of mobile phone. This discussion will indirectly help us understand her personal characters and her everyday life. Chapter 7, meanwhile, will discuss empathy and design: how empathetic understanding of the user affects the design of a prototype called 'Personal Motivator'.

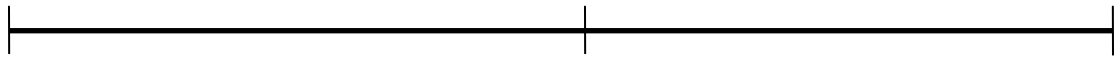
In one aspect, friendship observation is similar to covert participant observation, i.e. the researcher wears two hats. However, there are some distinctions between these two observational techniques. The following table compares between Friendship observation and covert participant observation.

Table 4. Comparisons between friendship observation and participant observation.

Criteria	Friendship observation	Covert participant observation
Immersion in culture	The researcher is a part of the culture. Studying the subject helps understand herself and her culture better.	The researcher has to immerse herself in the setting to understand the day-to-day activities of people under study.
Revealing the purpose of the study	The intention of the study must be made explicit and obtained from a friend. Nevertheless, the researcher's presence may not pose problems due to their friendship.	The intention of the study may not be made explicit to minimise the effect of researcher's presence to the subject.
Playing of roles	The researcher plays dual roles: friend and researcher, and eventually these roles overlap each other, making the boundary blurred.	The researcher plays dual roles: participant and researcher, and eventually these roles overlap each other, making the boundary blurred.

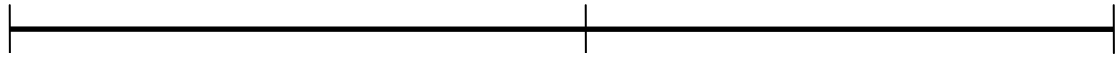
Figure 9 on the next page shows how friendship observation (shown in blue colour) fits into the Five Dimensions of participant observation (as adapted from Michael Quinn Paton, 1986) which is already shown in Chapter 3.

1. Role of the observer



Full participant observation | Partial observation | Onlooker: observation outsider

2. Portrayal of role to others

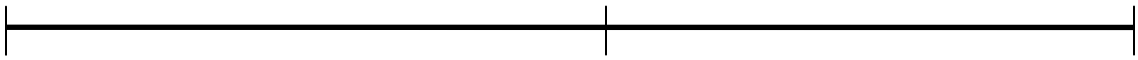


Overt observations: subjects know that observations are being made & who the observer is. | Observer role is known by some, but not others | Covert observation: subjects do not know that observations are being made or that there is an observer.

3. Portrayal of study purpose to others

Full explanation of real purpose to everyone | Partial explanation | Covert: no explanation | False explanation: subjects are deceived as to the study purpose

4. Duration of observations



Single observation; limited duration (e.g., one hour) | Several observations; limited duration | Long-term, multiple observation (e.g., months, years)

5. Focus of the observations

Narrow focus: single element, component, variable | Expanded focus: predetermined set of factors or variables | Broad focus: holistic view of the situation, setting, subjects, etc. & possibly including letting the variables emerge "grounded" theory style

- Reliability Issue in Friendship Observation

Friendship potentially raises some methodological issues such as how reliable is the data collected based on friendship and how valid is the study. This section will discuss reliability issues related to data collected and interpreted based on friendship. Chapter 7 will discuss how friendship influences the validity of the study.

The main weakness is that with friends, we seldom (or never) bother to double-check what we think of our friend because we always thought that we understood her better than anyone else. While it is common to say that "You've got to trust me because I am her friend", I knew, as the researcher, that I had to be very careful with my interpretation because as her friend, there is some possibility that I would make interpretations based on my [subjective] personal judgment.

The following steps, however, can be taken in ensuring that interpretation is more reliable:

1. Ask the subject again – A few times I had asked her about her particular behaviour using different questions (rephrase the questions) at different time. Here, I learned an important lesson. As her friend, it was okay for me to ask her about, for example, how she did something. However, it is not easy for me to ask for an explanation for her behaviour. There was one time when I asked her about certain behaviour, she looked surprised and said, "You should have known it". As her friend, she expected me to know her better, therefore asking a question about her behaviour or action seemed inappropriate based on our relationship. Her such reaction was probably because she saw me as her friend, not as a researcher at that time.

2. Observe to see if the same behaviour gets repeated. It may take months or even years to see if the same behaviour gets repeated, but interpretation based on repeated observation proves more reliable.

3. For example, in Chapter 6, she is described as a person who can easily shed tears upon reading a simple but meaningful message from a friend. I have seen this behaviour repeatedly at different times in different situation. For example, she had once said, "I am often touched with nice gestures from a friend". In addition, her old friend who visited her recently from Leeds also confirmed this behaviour.

4. Refer to literature – in order to make sense of what I had in my mind about her, I had also referred to previous studies. For example, she often texted messages to certain people who were close to her to maintain their relationships. Reid and Reid (2004) confirm that texters are more likely to text to a particular group as opposed to many groups and texting can facilitate a deeper, more meaningful relationship.

On one hand, friendship has potential to provide benefits to the study and design activities, for example, Chapter 7 shows that friendship helps the designer understand the subject emotionally and therefore the designer is able to empathise in the design, and Chapter 8 shows that friendship helps minimise the pressure of working on a project and care for the subject as a person.

The following discusses how the findings are reported in this thesis.

5.2.3.4 Reporting Data

Data collected from the above techniques are classified into two types:

- Her use of mobile phone

Chapter 6 will describe how the subject uses her mobile phone, in particular, reasons for her dependence on her mobile phone alarm.

- Her use of text messaging

Chapter 6 will also discuss how certain type of text message can have effects on her emotionally. Understanding of her everyday life and personal characters help inform design decisions which are discussed in Chapter 7.

5.3 Reflections of Single Person Study on the researcher

Single person study indirectly reflects deeply on myself: I have grown myself as a researcher and a designer.

5.3.1 Grow as a researcher

Studying one person in detail helps the researcher understand some other people. Chapter 6 will discuss how studying KN helps understand other people using their mobile phones. It helps the researcher develop a 'bottom-up' analytical skill – an ability to generalise a condition based on a specific context.

In addition, it serves as a learning process for the researcher as emphasised in Chapter 2. As highlighted by Dreyfus and Dreyfus (1986), a single person study can

produce a type of context-dependent knowledge that helps allow people to move from being beginners to experts.

5.3.2 Grow as a designer

Studying one person helps a designer design for that person better. As highlighted in this thesis, the prolonged study of the subject drew the designer and the subject closer to each other. They share similar beliefs, understanding, and experience as highlighted in Chapter 8 later. As a result, the designer is able to empathise with the subject. Empathy is a term that describes an understanding of someone's feelings as though they were one's own. Chapter 7 will show the empathetic understanding with the subject influences decisions on the design of an application.

5.4 The Journey of Single Person Study

The thesis 'Single Person Study' can be illustrated in the two different diagrams. Figure 10 is a general timeline that shows the duration of the PhD work including the development of friendship, and Figure 11 is a more detail timeline on a single person study.

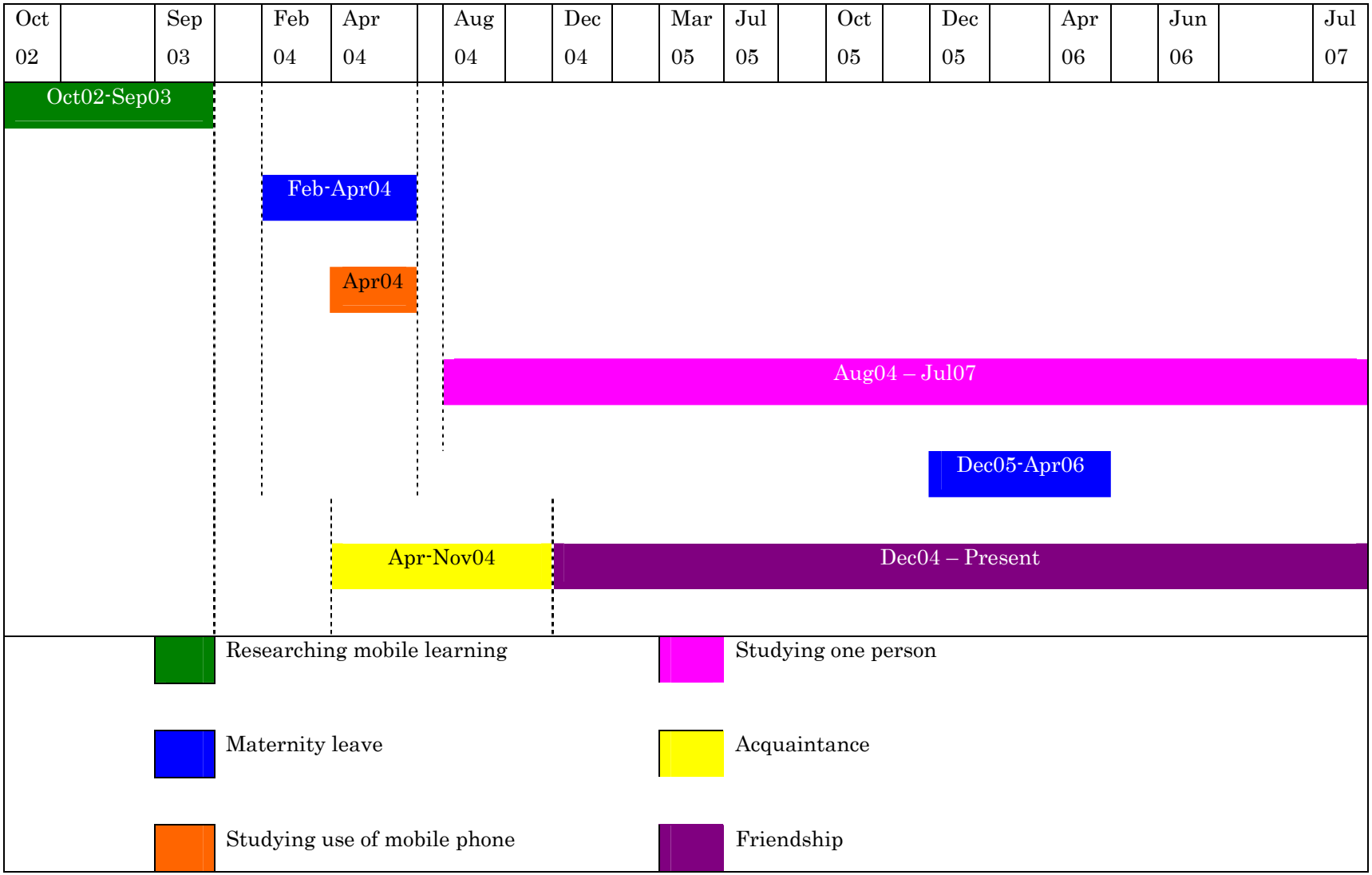
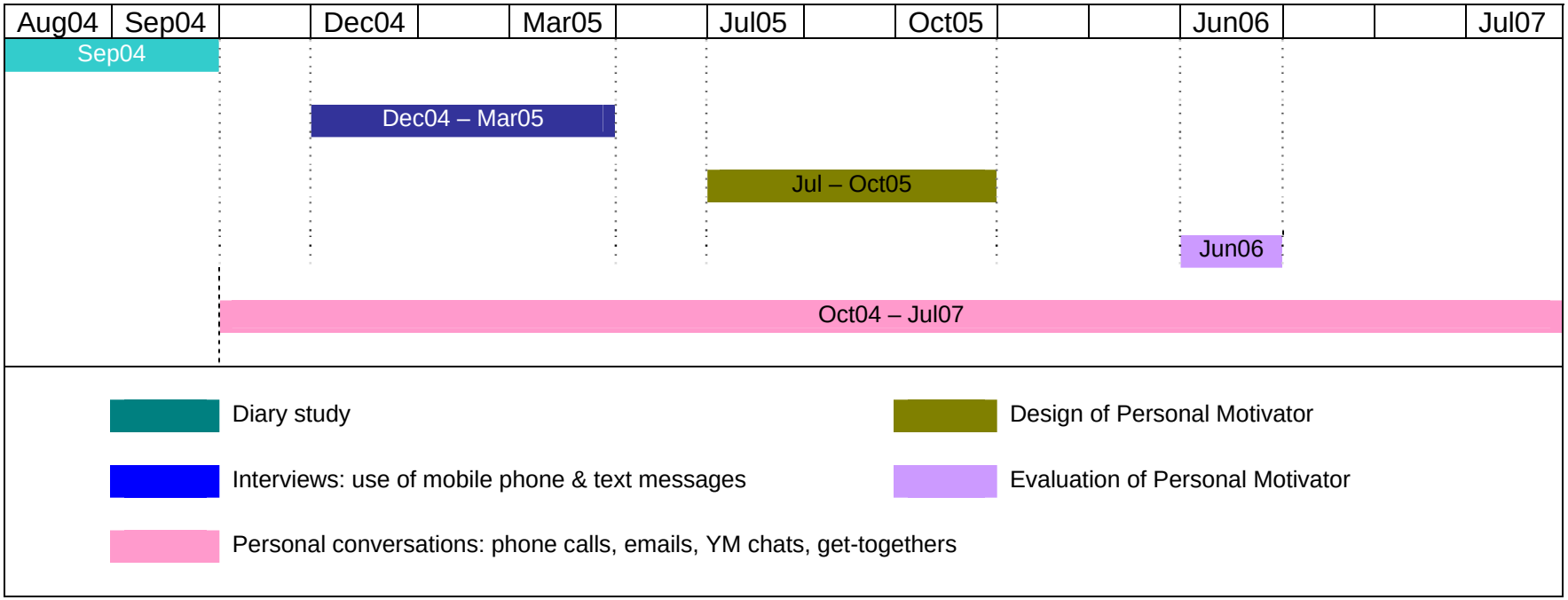


Figure 10. Timeline that shows duration of PhD work including the development of friendship

Figure 11. Timeline that shows activities of a single person study both formal and informal



5.5 Conclusion

This chapter discussed the study of one person and the methodological issues surrounding it.

The study studied a single person for over three years. Due to the prolonged study, it inevitably affected the relationship between the researcher and the subject: they became friends.

Personal relationship between the researcher and the subject however affected the study too. It affected how some of the data in the study were collected and therefore reported. Because of friendship, an observational technique called 'Friendship observation' emerges as part of doing research. This chapter has discussed how friendship observation was done including how data were collected and reported and ways to increase the reliability of the data.

Although a single person study has raised some issues which may affect the validity of the study, it has indirectly helped grow as a researcher and a designer. The researcher may develop generalisation skills based on deep understanding and careful observation of a person, and the designer is able to empathise with the subject and reflect it on the design of the application.

Chapter 6

This chapter highlights the following:

- Much of the understanding of people in general can be achieved from the study of one person.

- Studying one person helps understand the uniqueness of an individual which could be overlooked with a group study.

- Studying someone similar helps understand oneself better.

Chapter 6

Studying one person: How KN uses her mobile phone

6.1 Introduction

This chapter discusses how KN uses her mobile phone in her everyday life. In particular, this chapter aims to describe how studying a person can help understand other people in general as reflected in her use of mobile phone. KN is a mother, therefore, studying her can hopefully provide some ideas about how mothers use their mobile phones in their everyday lives.

Studying a single person enables the researcher to understand the uniqueness of that person. This chapter will also show how KN uses her mobile phone as an alarm and text messaging as a friendship (emotional support) tool and her deserved mini breaks.

Deep understanding of KN makes me become more aware of myself. I discovered that we are more similar than different. Studying her is like a mirror that reflects upon myself.

6.2 KN and her mobile phone

This section begins with how she acquires her mobile phone and will later discuss how her mobile phone comes into her life.

6.2.1 Who is KN?

KN is a mother who is also a mobile phone user. She lives with a husband and four sons. At the time of this study was conducted, she was doing her PhD at Lancaster University. Chapter 8 will discuss more about her.

6.2.2 How she became a mobile phone owner

Knowing her as my friend, I knew that the subject, KN, received her mobile phone **as a gift from her husband**. In fact, it is quite a common practice in the Malay community in Lancaster that a wife receiving a mobile phone from her husband.

I knew that although she had her own preference for the mobile phone[16], it was her husband who determined and bought the mobile phone for her. She somehow had to accept it because it was a 'gift' from her husband. Her eldest son once tried to persuade her to like the new mobile phone. He said, "Mom, this phone got a speakerphone, so you can talk while driving".

[16] Based on a short interview over the phone in 2006.

6.2.3 How she becomes a mobile phone user

KN generally uses her mobile phone for activities that are related to her functions as a wife, a mother, a student, a friend, a daughter, and a sister. She uses her mobile phone mainly for:

a. her everyday coordination

One of the major impacts of mobile telephony is likely to be its contribution to the micro-coordination of everyday life (Ling and Yttri, 2000).

KN communicates with her husband mainly for their household coordination, for example, asking him when he would get home, whether she needs to cook dinner for the family, or when he would pick her up at the university.

She uses her mobile phone as a clock especially when she is in her office. She said that her office does not have any clock. Because of this, she often refers to time on her mobile phone.

Ling and Vaage (2000) suggest that women need for the device in the coordination of domestic life more than men. For example, KN sets an alarm on her mobile phone every night to help wake her up the next day or if she takes a nap during the day. The discussion on mobile phone alarm is covered in Section 5.3.

b. her relationship maintenance

Like other people, KN also uses her mobile phone to keep in touch with other people. However, she said, “I don’t contact everyone in my phone book”. She only keeps in touch with her set of friends – two good friends from her

undergraduate years and one from her workplace whom she calls 'buddy'[17]. This aspect of mobile phone communication will be covered in more detail in Section 6.4 – her use of text messaging.

c. her picture album

The quality of digital images captured by camera phones has been substantially enhanced, from the original 110K pixel cameras to the recent release of 5 mega-pixel mobile camera phones. With camera phones, users can snap pictures of famous sites and things that people may find beautiful or funny, or simply everyday events.

KN often uses her camera phone to capture spontaneous moments, especially when her children do something unique or funny. She said that whenever she thinks of them, she will browse their pictures on her mobile phone.

d. her source of instant information

KN once said, "My mobile phone is as important as my wallet." She admitted that she could not imagine herself if she had ever lost her mobile phone. She kept important information in her mobile phone, such as the contact numbers of her husband, families in Malaysia, children's schools, dentists, friends, and university. She was once asked to provide with a contact information to a friend (from her diary entry). Since she kept the information in her mobile phone, she just grabbed the phone and scrolled down through her phone book to look for the requested information.

[17] More about her friends is discussed in Chapter 6.

e. her security

With mobile phone, she knows that she can contact other people and other people can contact her in case of emergency. For this reason, she often makes sure that she will bring her mobile phone wherever she is[18].

Feeling safe for her children is another reason she uses her mobile phone. KN uses her mobile phones to check on her children to find out what they are doing, whether they have eaten and done their homework, and those sorts of things for ensuring that her children are safe when she is not at home.

These data are further supported by a study done by The Australian Psychological Society. The Australian Psychological Society (2004) reports that a mobile phone helps parents keep track of their children and older adolescents are more likely than younger ones to feel safer when going out when they have a mobile phone with them.

6.2.4 How others use their mobile phones

Most literature on the use of mobile phone reports similar findings: In general, people use mobile phones for the following reasons:

- coordination - for example, Ling and Yttri (2000) talk about micro-coordination meanwhile Palen (1999) talks about social coordination,
- communication - for example, Smoreda and Licoppe (2000) discuss gender specific use of telephone and Palen et al. (2000) explain behaviour and practice of new mobile phone users,

[18] This is very much related to her personality: as a precaution because we do not know what will happen to us.

- security – for example, The Australian Psychological Society (2004) discusses the psychological aspects of mobile phone use among adolescents.

- instant information – for example, Aoki and Downes' (2003) research with American college students.

The advancement in mobile technology, however, has made mobile phones become more ubiquitous. In more recent publications, mobile phones have been used for expressing one's identity (Berg et al., 2003), as a fashion symbol (Katz & Sugiyama, 2005), and for entertainment (ITU/MIC, 2004).

In addition to this, deep understanding of the single study of KN allows me to understand her uniqueness. As highlighted in her diary in Chapter 5, she relied on her mobile phone alarm a lot. From the diary and the interviews, she admitted that she often used text messaging.

Next two sections, Section 6.3 and Section 6.4, discuss how she uses her mobile phone alarm and text messaging.

6.3 Her use of mobile phone alarm

Chapter 1 has highlighted that KN has used her mobile phone alarm for reminding her of her routine activities. This section will investigate possible reasons for her dependencies on her mobile phone alarm.

KN said, "I am manning the house all by myself"[19].

[19] She is the only woman in her family. It becomes her responsibility to manage the house.

Before she gets herself busy in the kitchen preparing breakfast for her family in the morning, the first thing she will do is to set alarm to remind her of things that she needs to do later for that day.

When she is in the kitchen, she usually 'ignores' her mobile phone as she is completely immersed with her tasks. Only after her children have left for schools, she then will have time with her mobile phone. This is how her mobile phone 'reappears' in her life. She often takes this opportunity to check for any missed calls, read (or re-read) text messages, update contact information, or simply learn a new function.

She often tidies up her house before she leaves for her work. She said, "When I come home, I like to see my house as it was when I left it". However, she admitted that she can sometimes get carried away with her house chores. She said, "When I heard my phone (alarm) ring, I knew that it was time for me to stop whatever I was doing and go study".

Similarly, when she gets to her office at the university, the first thing she will do is to plan what she has to do, for example, when she needs to go to library and how long she should read. She then will set alarms to help her with the time management.

This is illustrated in her diary. She said, "As I had to run some errands during lunch time, I had to manage time equally for me to do a bit of reading in the room and then off to the library to search for more reading references. Set alarm to assist me with my time management…Came back to my office and set alarm again for time I should leave for home".

The alarm is not only used for managing time for her study and family commitments. Alarm is also used for managing her leisure activities. For

example, she is still in touch with her best friend who is in Malaysia. Because of the time difference[20], she and her friend plan when and how they should communicate. Very often, they chat on Yahoo! Messenger (YM). They often chat about their families, studies, and lives. Chatting with a friend can be fun but she knows that she should not get carried away unnecessarily. She admitted that she relied on the phone alarm and clock to help her manage her 'precious' time effectively.

There are times when she also wants to get away from her everyday routines[21]. At home, she tries to make time to watch her favourite TV programmes such as EastEnders, OC (Orange County), and Extreme Makeover[22] or simply pamper herself in the bath. She said, "I want to watch EastEnders but I want to take a nap first. So I set alarm to remind me".

Razak and Dix (2006) suggest that mobile phone can be used as a tool for expressing one's identity. As a mother and a PhD student, she wants to carry out her duties with full responsibility. She strives to be a good mother and student at the same time. She knows that she can only achieve this if she can effectively manage her time for each responsibility.

She learned that mobile phone alarm can actually help manage her everyday routines. The alarm serves her as a time-management tool: alarms can remind her of her duties.

[20] Malaysia is 8 hours earlier than the UK .
[21] Study and family commitments.
[22] The information was collected in 2004/5 -some of the programmes may be no longer shown on TV.

6.4 Her Use of Text Messaging

From her diary, I discovered that she also used text messaging more often as a means of communication. She said that text messaging is a 'keep-in touch' tool because it lets her:

- pass her thoughts to her friend

She said that it is more convenient for her to send a text message than to make a phone call, to a friend especially if she has not heard from her for quite sometime. She said that it is much easier to text "Hi" or "Hello" than to talk on the phone. She said, "It is really not nice of me having to call my long-lost friend just to say 'Hi' or 'How are you?', and then hang up. It's rude."

She might also end up talking more on the phone and probably forget about what she wanted to say in the first place. However, text messaging, as she suggested, is able to pass our "thoughts" to our friends without saying a lot of words. For her, text messaging was like "I remember you" or "thinking about you" without having to interfere with one's everyday life. She believed that in order to be in touch with our friend, we didn't need to say a lot. We could simply pass our "thoughts" to her. She said, "It is like a greeting card. It is like a gesture from you to your friend."

- share her life together with her friend

She values friendship. She still keeps in touch with two of her friends from her undergraduate years, and a friend from her workplace, UKM[23]. Because of the distance and their everyday commitments, she and her old friends can

[23] Universiti Kebangsaan Malaysia is a local university located in Bangi, Malaysia. She had taught English there before she pursued her PhD at Lancaster University.

not get in touch with each other often. But they implicitly promised between them that they would stay friends forever. As Reid and Reid (2004) found with 982 respondents, "texters seem to form closely knit groups of 'textmates' with whom they engage in regular, maybe even perpetual, contact" (Reid & Reid, 2004).

She is also in touch with her UKM's friend whom she calls 'my buddy'. She said that she shares a lot of things with her because they both have a lot in common – a wife, a mother, a colleague, and a student. She told her buddy about her supervisor, studies, family, experience, and others. The kind of message that they send each other is like "I am seeing supervisor. Wish me luck" ; or "I have just been upgraded". She suggested that their conversations are all about what they "have been up to".

- give her emotional support to her friend

Text messaging is also like her emotional support to her friend if her friend is in difficulty. There was a text message from her close friend in Malaysia, asking her to pray for her son. Her friend's two-year old son had a heart problem and had to undergo a surgery. Since she was not in Malaysia, she sent her a text message to give her support. She said that her text message would serve as 'a prayer' for her friend's son.

The heart operation was a success according to her friend. She felt so happy hearing good news that she immediately replied her friend's text. However, she was later told by her other close friend that the boy contracted a kidney problem as a side effect from the operation. She felt so sad and sympathy for her friend that she sent her another text that says,

To: OG
S cald. Wil pray 4 E.

A reply from OG that says:

From: OG
Thank u dear

The boy died a few days after the operation.

These messages are very brief, yet full of emotion. She said that it is something that she cannot say over the phone. For her, texting can be more emotional than phone calls. According to Reid and Reid (2004), some people who prefer texting suggest that they get something out of texting that they cannot get from talking.

- have "mini" breaks from her routines

It is nice to have some little breaks from everyday routines. She described these little breaks as her 'rewards'. Sending and replying text messages serves as her mini breaks which she deserves.

She often feels that she needs to reply to a text message immediately. She said, "I can feel that the text sender wants a quick reply from me." Her friend in Malaysia texted her asking for her *Peanut Sauce* recipe. Peanut sauce is a Malay traditional dish which is often served during Eid Celebration or special occasions. She was in the kitchen when she received the text message. Since her mobile phone was with her, she immediately replied her text. Instead of texting the whole recipe, she told her how to cook the sauce. She

said, "I was trying very hard to explain to her in one page only. I usually don't send a message if it is more than one page long."

Sometimes she has questions that she needs to ask someone but is willing to wait for his reply. She will text her queries "there and then" to prevent her from being forgetful later. For example, she asked her husband when he would come home, or whether she had to cook for dinner. These questions are important for her but she can still wait for his reply.

There are times when she just wants to say 'mushy' stuff to her husband such as "I love you" or "Thinking of you". She believes that some people just have a difficulty to say those words by themselves. And she believes that text messages can just do that. She suggests that templates could be helpful for people who have difficulty to write their own feelings. She said that she used to get one of these templates from her husband. She said, "When I first got his text, I said 'Wow!!!'. Later I found out that my husband actually used one of those from the template and sent it off to me. Hey, that is okay. It is the thoughts that count."

6.5 Reflection: Studying a person helps understand oneself

Studying KN is like a mirror that reflects on myself. I get to see things which are not clearly seen by myself because they have been a part of my life. Dix (2008) says that "mirror often shows not only the unseen side of an object but also oneself and oneself in relation to the object. The seer and seen are themselves seen and, like Berger's lilacs, the partiality of one's seeing

becomes more obvious". I learned that KN and I both are more similar than different. We actually share the following:

- Similar experience

KN is a mother doing a PhD abroad. I am also a mother studying for a PhD. Studying her actually helps me understand myself and other people in similar conditions better. For example, understanding her use of mobile phone alarm makes me realise that I actually have many commitments in my everyday life which I should not take for granted. Although my family understands that I have to devote most of my time for my PhD, I should not simply take my family for granted. As KN said, "I came here for my PhD, but I also have another priority in my life, my family. I just can't ignore them. They already sacrificed their lives for me. My husband quit his job and my kids gave up their comfort lives to come here with me. It is not something that everyone can do".

- Similar beliefs

As a mother, we both feel that it is our responsibility to make sure that our children can compete (or at least are on par) with other children in schools. Furthermore, as Muslims, we feel that it is also our responsibility to make sure that our children practice fundamental Islamic teachings, for example, performing prayers, reading Quran, and fasting in the month of Ramadan[24].

[24] Ramadan is a month in the Islamic calendar in which Allah requires people to fast starting from the dawn to the dusk, for a period of 29-30 days, subject to a moon sighting.

- Similar personal characters

We both enjoy each other's company. Each time we meet up, there will be at least a topic that we will talk about. We can even talk for hours. Although our conversations usually evolve around our everyday lives, we actually appreciate them very much because indirectly they help us remind each other about our responsibilities, commitments, or simply guidance in our everyday lives.

Being able to identify these similarities actually helps understand the subject better. Chapter 6 will discuss empathy: a term that describes an ability to understand how another person feels due to a deep understanding of that person. Empathy in this thesis is achieved through friendship as discussed in Chapter 8.

6.6 Conclusion

This chapter studied a single mobile phone user. Studying her helps us understand her uniqueness: she depends on her mobile phone alarm to help her manage her everyday life and text messaging as her emotional support tool and as her deserved mini breaks. Studying a person, too, can actually help understand oneself better, for example, one gets to understand her own responsibilities, beliefs, and personal characters.

Chapter 7

This chapter highlights the following:

- Shared feelings and backgrounds help the researcher empathise with the subject.

- Empathy affects the design of an application, Personal Motivator.

- Deep understanding of a person helps design for other people in general.

Chapter 7
The Design of Personal Motivator

7.1 Introduction

This chapter describes how understanding a person helps design an application for people in general. The study begins with a deep understanding of an individual based on friendship and shared experience and religious beliefs.

Doing a PhD can be emotionally 'torturing' especially if a person has to deal with many commitments in her everyday life. From the study, it is found that certain text messages can have emotional effects on her. Understanding how the subject, KN, struggles with her everyday commitments has motivated the researcher to build an application called Personal Motivator. Personal Motivator is actually designed to help soothe her emotional pains and will hopefully motivate her to move on.

Personal Motivator is later evaluated on other people who are different in terms of age groups, gender, lifestyles, and cultural and religious beliefs.

Mothers and PhD students are assumed to find this application most useful. However, the group study reveals that not all mothers struggle with their everyday lives, therefore, they may not really appreciate the application. When the participants are studied individually, it is the individuals who are under pressure, who appreciate advice, and who believe in God appreciate Personal Motivator the most.

The application works for other people because the designer is able to empathise how an individual feels under pressure and therefore helps design affectively for people who are in a similar situation.

7.2 Motivation for a prototype called Personal Motivator

A prototype called 'Personal Motivator' was designed for this research. The idea of Personal Motivator came from me, however, I still discussed this idea with her to find out whether she liked it. There were two factors that motivated me to design Personal Motivator: as her friend, I knew how she was coping with her everyday life; and as a researcher, I understood why she liked text messaging (see Chapter 6). She agreed with this idea and in fact was excited about it. She said, "I feel honoured knowing that someone will design something just for me".

The following highlights some aspects of her everyday life and her personal characters based on our friendship.

There were times the subject, KN, had some emotional roller-coaster feelings, especially when she was thinking about her PhD work which seemed to be "dragging" her for years. She always knew that she often felt better if she could share her feelings with her friends. She had a set of friends whom

implicitly would stay together and support each other forever. She believed that moral supports from family and friends were important in helping her cope with a difficult situation.

Emotional supports can be in terms of 'soothing words', 'words of thoughts', 'words of courage', and any nice words that can be considered as motivators. These words can come from word phrases from famous people, quotes from Quran and Hadith, or simply nice words from a friend. She appreciates them all because they can give a great impact on her emotionally. For example, in her diary she expressed her feelings upon reading a simple text message from a friend. The text message that says:

Dear God
Don't need lots of frens! As long as real ones stay with me, so bless them all, especially the sweetest one reading this.

She said in her diary that this text message has 'made her day' (refer to Appendix A, Day 1).

She appreciates friendship. She once said that nice words or thoughts from a friend can be worth more than a diamond. Her work colleague called her "Queen of tears" because she can get a teary eye easily even reading a simple (but touching) text message or simply getting a gift from a friend.

As her friend, I know she likes text messaging. Since I have known her personally – how she copes with her everyday life and in consultation with her, I designed an application that could provide her an emotional support through text messages.

In order to make this application usable – effective – for her, I first should understand her reasons for text messaging and the kind of emotional support that works for her.

7.3 Requirements Gathering

7.3.1 Understanding her everyday life

She was a mother and PhD student. She was struggling hard to carryout her responsibilities effectively. While her primary reason for coming to this country was for her PhD, she could not just 'ignore' her family. After all, her family had sacrificed a lot for her. She said, "I'm here for my PhD, but, I can't just ignore my family. My husband quit his job and my children gave their comfort life to be here with me". Because of this, she knew that she had to equally manage her time to enable her do her everyday commitments effectively.

However, problems and difficulties happen to everyone and she is no exception. For example, shortly after her husband returned to Malaysia in summer 2006, he had a heart attack. It was his second heart attack[25]. Based on her experience, she knew how serious the heart attack could be. The fact that she could not be there for her husband when he needed her had made her really worried and sad. Despite living on a different continent, she made an effort to get in touch with her husband everyday and helped settle his hospital bills.

February last year, her only sister passed away suddenly. Her sister died of an asthma attack. Her sister's sudden death had a great impact on her and

[25] He first had a heart attack when he was only 36 years old. She was the one who drove her husband to the hospital and took care of him until he got fully recovered from the attack.

her family. She was very close with her late sister. In fact about a week before her sister's death, her sister wanted (in a text message) to come to Lancaster to help her pack her things[26]. She was really depressed because she didn't think that she could ever cope with her situations – without her husband by her side, her sister's sudden death, and her thesis deadlines.

Sometimes she feels 'alone' in this world because she said that nobody seems to understand her feelings – the difficulties and struggles that she has been through. Although her family is supportive for her, sometimes they do not really understand how she actually feels because they are not in the same situation as she is in.

Here in Lancaster, Malaysian female postgraduates have implicitly formed a network of friends who will support each other physically and emotionally. This kind of support is very much needed because it helps them get through their difficult moments and motivates them to keep going until they reach their destination – that is getting their PhDs.

In addition to informal support network, as a Muslim[27], I know that she appreciates quotes from Quran and Hadith. For Muslims, Quran and Hadith are the sources for their inner strength.

7.3.2 Reasons for her use of text messaging

She likes text messaging. She described it as a "keep-in-touch" tool. Based on the exploratory talks and friendship observation, she prefers text messages because:

[26] She was originally planning to go back to Malaysia for good in March.
[27] A follower of the religion of Islam (Source:TheFreeDictionary - http://www.thefreedictionary.com/muslim).

i. Words (although short messages) may 'touch' her emotionally.

ii. She is a person who wants assurance or certainty. She found that text messaging is able to reach someone and therefore offers her a sense of guarantee.

iii. Text messaging is a safer way to contact people because it does not disturb daily routines of herself and other people.

The next section will discuss the kind of word phrase that she might prefer, as a part of designing a prototype.

7.4 Designing Personal Motivator

A prototype known as Personal Motivator will deliver a text message that is hoped to emotionally motivate a reader. This text message would be sent off from a web-based text messaging service to the subject's mobile phone for a period of seven days.

To design Personal Motivator, I first paid attention to the type of the word phrase and text writing. As mentioned earlier, a text message although simple is able to affect KN emotionally.

7.4.1 Choosing the type of word phrase

To find out the kind of word phrases that could have positive emotional effects on her, I carefully selected seven word phrases from individuals and famous people about motivations which I gathered from various websites on the Internet. These word phrases were sent off as text messages to her mobile

phone. One word phrase was sent as a text message everyday, for a period of seven days.

The following are the findings:

- Word phrases that worked for her:

  i. Natural phrases. For example, "Strength does not come from physical capacity. It comes from indomitable will."

  ii. An advice or encouragement. For example, "Start with necessary then possible and you are able to do the impossible." Or "Today give someone one of your smiles. It might be the only sunshine he sees all day."

- Word phrases that did not work for her such as:

  i. Directive or instructive. For example, "Always kiss your children good night although they are already asleep."

  ii. Argumentative. For example, "A conclusion is the place where you got tired of thinking."

  iii. Unparallel. For example, "You can't wrap ***love*** in a box, but you can wrap a person in a hug." She was expecting '…but you can wrap ***love***' not a person in the second clause.

7.4.2 Writing a text message

- Choice of language

She often writes a text message in English, but it depends on the person whom she is writing the text to. Sometimes, she uses both languages – English and Malay in a text message. For this experiment, she prefers English.

- Style of writing

To write a text, she prefers to abbreviate a word because abbreviation does not change the sound of the word. For example,

house – hse,
tonight – 2nite,
called – cald,
thoughts – thots,

She does not prefer shortforms because shortforms might affect the original sound of the word. It often happens with Malay words, for example, *macam mana ini* - meaning *what should we do?* These words, *macam mana ini*, are commonly shortened to only *camne ni*. Although their meaning is still the same, they sound differently.

Other studies (e.g. Ling & Yttri, 2002; Kasesniemi & Rautiainen, 2002) also illustrate several mechanisms for deriving these shortened forms including "the use of traditional abbreviations or acronyms, ad-hoc shortened forms 'made up' during the course of the communication, and the use of numbers and letters to represent sounds" (Grinter & Eldridge, 2003).

- Length of a text message

Up to one screenful. But she does not mind a bit of scrolling.

7.4.3 Sending text messages

According to her, she does not mind receiving this type of text message everyday (Section 6.5 will describe the type of message), however, in order for her to appreciate it, she prefers to receive it only a few times in a week. She emphasised that she takes these text messages seriously. She said, "I try to act upon them".

She also likes to read a text message as soon as the text got into her mobile phone. To make her appreciate the messages, the text messages should be sent when she is not in hurry[28].

- Her rush hours
    - Before 9 am – busy preparing breakfast and packed lunches for her family.
    - Between 3 and 3:30pm – children are coming home from schools.

[28] If she received a text message when she was in hurry, it was more likely that she might not read it properly, or worse, might mis-interpret the content of the text message.

7.5 Prototyping Personal Motivator

Personal Motivator is a prototype that sends words of thoughts as text messages from a web-based text messaging service called TM4B (available at http://www.tm4b.com) to a mobile phone. The web service enables an individual to manage text messaging to a group of people much easily.

Since the text messages were entered to the database using a keyboard, all of the words were typed in full rather than being abbreviated. However, the subject, KN, replied that it was not a problem for her as long as they were not really long on her mobile phone.

Table 5 records the delivery of text messages in Personal Motivator.

Table 5. The delivery of text messages in Personal Motivator

Day	Date	Time	Message
1	10/10	3:40pm	Happy moments, praise god. Difficult moments, seek God. Quiet moments, worship God. Painful moments, trust God. Every moment, thank God.
2	11/10	10:06am	Do not wait for tomorrow for what you can do today, for tomorrow is another day. Do what you can do right away.
3	12/10	2:31pm	Focus on where you want to go, not on what you fear.
4	13/10	10:01am	If God can turn night into day, He can turn a burden into a blessing.
5	14/10	10:39am	Don't be afraid of making mistakes, but do be afraid of making the same mistakes.
6	15/10	11:33am	It is not how much you do, but how much love you put in the doing.
7	16/10	9:50am	No duty is more urgent than that of returning THANKS.

7.5.1 Results:

All of the messages except for the fourth one[29] have positive emotional effect on her – refer to Appendix D. At the end of the feedback, she added, "…guess what I sort of look forward to receiving a message from you[30] each day".

7.6 Testing on different people

This experiment was done to find out whether studying a person can design for people in general. To do this, fifteen mobile phone users were chosen to participate.

7.6.1 Assumptions

Several assumptions were made:

- Mothers doing PhDs are the most under-pressure. Therefore, they will appreciate the application the most.
- Single, mature PhD students could be struggling, therefore, may appreciate it as well.
- Young, undergraduate students might not be as tense as the two groups, therefore, might not really find the application useful for them.

[29] It simply did not have any bearing on her.
[30] Although the messages came from the web service, the subject personally knew that they all came from me.

7.6.2 The targets

The participants' profiles are recorded in Appendix E. For this study, they were divided into three different groups based on their lifestyles.

Primary target:

Participant profile: wife, mother, and PhD student
P3, P5, P7, P8, P11

People in the primary target are expected to find the application most useful because their lifestyles are much similar to the subject (KN).

Secondary target:

Participant profile: single, mature PhD student
P1, P2, P4, P9, P10

There is high possibility that people in this target group might appreciate the application as much as people from the first group.

Others:

Participant profile: single, young Undergraduate student
P12, P13, P14, P15

Participant profile: a husband of a PhD student, looking after two young children
P6

People in the single groups are expected to find this application least useful because of different maturity levels and lifestyles. However, the spouse could find this application rather useful for him.

Using the same online service provided by TM4B (http://www.tm4b.com), the same text messages were sent to all of the participants' mobile phones. A text message was sent everyday, for a period of seven days, approximately at the same time[31] as they were sent to the subject, KN.

7.6.3 The Findings

The results are summarised in the following table. Emotionally affected on the following table means the messages have positive effects on them emotionally. These are the feedbacks[32] given by the participants after they had participated in the study. The effects, however, can be positive and negative. The positive effects are described in the section – Who found the application most useful? Meanwhile, the negative effects are reported in the section – Who did not like it? Their feedbacks are recorded in Appendix E.

[31] There was a little difference in time because of some technical problems.
[32] Each participant was asked individually about their feelings in the follow-up interviews.

Table 6 Summary of the overall results

Day	Message	Emotionally affected? No of Participant	
		Yes	No
1	Happy moments, praise god. Difficult moments, seek God. Quiet moments, worship God. Painful moments, trust God. Every moment, thank God.	12	3
2	Do not wait for tomorrow for what you can do today, for tomorrow is another day. Do what you can do right away.	9	6
3	Focus on where you want to go, not on what you fear.	7	8
4	If God can turn night into day, He can turn a burden into a blessing.	9	6
5	Don't be afraid of making mistakes, but do be afraid of making the same mistakes.	8	7
6	It is not how much you do, but how much love you put in the doing.	5	10
7	No duty is more urgent than that of returning THANKS.	8	7

7.6.4 Who found the application useful?

Feedbacks from the forms and interviews helped analyse whether a person appreciated the application. In general a person who reported to **like at least four (4) text messages** would find the application useful.

Table 7 Overview of the feedbacks from each participant

Participant	*Emotional impact (Yes(Y) / No(N))*						
	TM1	*TM2*	*TM3*	*TM4*	*TM5*	*TM6*	*TM7*
P1	*Y*	*N*	*Y*	*N*	*Y*	*Y*	*Y*
P2	*Y*	*Y*	*Y*	*N*	*N*	*N*	*Y*
P3	*N*	*N*	*Y*	*N*	*N*	*N*	*N*
P4	*N*	*Y*	*N*	*N*	*N*	*N*	*Y*
P5	*Y*	*Y*	*Y*	*Y*	*N*	*N*	*Y*
P6	*N*	*N*	*N*	*N*	*N*	*N*	*N*
P7	*Y*	*Y*	*N*	*Y*	*Y*	*Y*	*Y*
P8	*Y*	*Y*	*N*	*Y*	*Y*	*N*	*Y*
P9	*Y*	*N*	*N*	*Y*	*N*	*N*	*N*
P10	*Y*	*Y*	*N*	*Y*	*Y*	*Y*	*N*
P11	*Y*	*N*	*N*	*Y*	*Y*	*Y*	*N*
P12	*Y*	*Y*	*N*	*Y*	*Y*	*N*	*N*
P13	*Y*	*Y*	*Y*	*Y*	*Y*	*N*	*Y*
P14	*Y*	*Y*	*Y*	*Y*	*N*	*Y*	*Y*
P15	*Y*	*N*	*Y*	*N*	*Y*	*N*	*N*

Wives Postgraduates Undergraduates Others

There were ten (10) participants who found the application useful: P1, P2, P5, P7, P8, P10, P11, P12, P13, and P14. The application was considered useful to these participants because they appreciated the messages given to them. Some of the messages were very much relevant to their conditions (at the time of the study) and some of them were considered as good advice or motivation.

- Relevant to their situations

These participants found this application – Personal Messaging useful because the contents of text messages were very much **relevant** to them at the point of reception, thus, had **touched** them emotionally.

The following are some of text messages that had positive emotional impact on some of the participants.

Text Message1: Happy moments, praise God. Difficult moments, seek God. Quiet moments, worship God. Painful moments, trust God. Every moment, thank God.

Too much focusing on work could make us "forget" our other priorities, responsibilities, and purposes in our lives. A religious text like TM1 was often useful to those who are Muslims. P1 explained, "I feel enlightened in a way, knowing that I'm not alone as God is my confidant. Sometimes forgetfulness comes, so this kind of sms is a point to ponder about life."

Text Message2: Do not wait for tomorrow for what you can do today, for tomorrow is another day. Do what you can do right away.

There were times when she just didn't feel like doing her work, especially if the work was quite impossible for her to do or she was simply not "interested" to do it. This was exactly how P2 felt towards her PhD work at the point of the study. She said, "It's amazing how a message can really strike a point. I was thinking about putting off some programming work until next day! Was feeling a bit ashamed of myself, so I changed my plan."

Text Message4: If God can turn night into day, He can turn a burden into a blessing.

As a PhD student, P5 had always been trying hard to get her thesis done. It really hurt her to know that her friend had already finished her PhD. She used to say, "I am happy for her that she got her PhD. You know what…I am just about to know my methodology. I just saw how my little pieces hang together." P5 liked TM4 the best. She said, "In ways that I cannot explain, this message kind of summarises all the other six messages." It is like this particular message can give hopes to those who are in difficulty.

- Good reminders

P7 and P8 liked the text messages because they were good reminders and could be useful for them. They said that they might apply some of them in their lives. In fact, P7 used TM2 as her motivation – "don't put off your work until tomorrow". P10 happened to like TM4 best – "If God can turn night into day, He can turn a burden into a blessing", so she decided to share this phrase with her blog friends. She had put this phrase on her weblog site.

7.6.5 Who did not like it?

Participants such as P3, P4, P6, P9, and P15, however, did not find the application useful. Below are their reasons:

- Irrelevant to their situations

P4 explained that he did not mind receiving any motivational quotes from a friend, however, he preferred them to be specific towards his situation. Since he found these messages were not relevant for him, therefore, he did not find

them useful at all, except for TM3 – "Focus on where you want to go, not on what you fear". He commented, "Now, you are meeting my expectation".

- Religious text messages

Two of text messages, TM1 and TM4, have some religious elements. While many of the participants liked them, anyone who thought religion was only for spiritual needs might not find these messages useful at all. For example, P4 often found them annoying.

As Muslims, P7 and P11 personally preferred the word God be changed to Allah as the name Allah would give more impact to them.

- Common phrases

P9 found most of the phrases common for her – she knew them already. She, thus, did not find them to have any emotional effect on her. There was only one text message that she had not heard yet, thus, liked it. However, she liked TM4 – "If God can turn night into day, He can turn a burden into a blessing". As a God believer, the text had an impact on her although the text was not new for her.

- Similar type of text message

P15 preferred different kinds of text messages, for example, a combination of motivation, reminders, and jokes. Since most of the messages were about encouragement and reminders, she said that she could predict the kind of message that would next come into her mobile phone.

- Too long and too short

Although she admitted that they were good reminders, P3 was 'turned' off because they were too long, thus, she had scroll a lot. TM6 and TM7 were both short, she however had lost them.

- For urgent purposes only

P6 was the only person who said "No" to all of the text messages. From the interview, he said that he actually liked the messages because they were good reminders. However, he emphasised that text messaging should only be used for urgent and brief conversations, for example, "I am coming to your place now" and "Play badminton at 7pm". He further suggested, "You should have sent them through emails".

7.6.6 Other factors influencing people's decisions

- Text messages were sent too frequently.

Some people like P2 found it too much to handle. Although they were good reminders, receiving this type of message everyday made her feel bored, impatient, and irritated.

- Expecting text message from someone important

P1 had expected a text message from her fiancé, but instead, she received this text message – TM4. She felt rather frustrated thus deleted this message.

- Some of the messages remind them of something that they would rather forget.

Generally, no one likes to be reminded of something that they do not like. For example, P1 was struggling hard to get her thesis done. Since TM2 reminded her very much about her work, she did not like it. She felt that her PhD work seemed 'never-ending' for her. P2 also hated it when TM5 reminded her not to repeat the same mistakes because she had just repeated the same mistake recently.

7.6.7 Interesting observations

When I told the participants that I would start sending text messages starting from next Monday, some of them were seen eager to participate. P15 said, "I just can't wait for the first message to come in".

After the fourth message, most participants reported that they were getting bored because the messages came to their mobile phones everyday, although they had been well informed about this before they had agreed to participate. From the table on the previous page, the number of people who liked the messages decreased from 8 on the 5th day and to only 5 on the 6th day. P2 said, "I am getting bored of text message as I get it everyday".

As they approached the last day of the study, they were actually looking forward to having the last text message. The last text was thought as "a big relief" for them because they had to be committed to the study for seven consecutive days. P2 sincerely said, "a bit relieved that this was the last message". There are some other participants who said it implicitly, for example, P4 said, "I guess this is kinda true", and P13 added that it was

short and sweet, but has great impact". P4 further suggested that it was what a person should do to the other.

7.7 Discussions

- It is about individuality, not the type.

Most of text messages[33] were designed to provide emotional support for people who have similar lifestyles : individuals who have many commitments in their everyday lives. With the group study, mothers and other mature postgraduate students are more likely to be under pressure.

Many factors can lead to stress such as work stress, exam stress, family matters, and personal problems. Being a mother and PhD student may not be stressful yet for P3 as she just started her PhD. Surprisingly, undergraduate students – P12, P13, and P14 – found Personal Messaging useful. They were least expected to have found this application useful because they might find this application rather irritating – they got reminders. When they took part in the study, they were actually sitting for their final exams.

P7 and P8 admitted that they did not really find themselves stressful. The reason they liked Personal Motivator because it helped remind them of their responsibilities. Personally, they seemed to appreciate any good advice that could benefit them in the future.

[33] Except for TM7 – it was actually about my appreciation for them: it was my way of saying 'Thank you'.

- Shared feelings, beliefs and understanding with an individual helps design for a subset of people.

Religious text messages can have a significant impact on some people. Most of the participants are Muslims. For Muslims, Islam - the religion, is a part of their lives. The religion affects the way they do things in their everyday lives. For example, P5 on commenting TM1, "In some ways it made me 'stop' from whatever I'm doing or slow down for a few moments to think about Allah." A Muslim is required to remember Allah (God) at all times. Personally, any God believer might think it is. However, it is easier for a person (or even a believer) to get carried away with her life, and therefore, 'forget' Allah[34].

Another example is a comment by P13 on TM4, "It has a deep meaning for those who are in a big trouble." For most Muslims, remembering Allah is the best way to help them cope with their stressful lives. Muslims are advised to trust Allah especially when they really need help.

There is a Hadith that says,

"If you put your faith completely in Allah, He will arrange for your sustenance in the same way as He provides for the birds. They go out in the morning with their stomachs empty and return filled in the evening." (Reported by At-Tirmidhi).

[34] It does not mean that Muslims have to pray or make 'zikr' all the times. Muslims are encouraged to do their jobs responsibly for the sake of Allah and not to delay prayers when they are already due.

7.8 Conclusion

This chapter has shown that studying one person helps understand some other people, and therefore, design for them. Personal Motivator was designed based on a deep understanding of a single person and found usable by other people who are personally similar to that person. Empathy, in this chapter, is achieved through sharing of experience and feelings that the researcher has had with the subject.

In one aspect, Personal Motivator is similar to some personalised services, for example, Message of the Day (MOTD) targeted for Lancaster University students and staff and ChristNotes which can be accessed at http://www.christnotes.org/email.php, a web service which emails a bible verse a day to its members.

However, the single person study brought up a kind of requirement with associated design implications that were new to the designer: the designer felt connected to the subject due to their similarities, therefore, could empathise her understanding of the subject with the design of the application.

Chapter 8

This chapter highlights the following:

- A prolonged study alongside personality and shared understanding affects the relationship between the researcher and the subject: they become friends. This somehow affects the role the subject plays in the research.

- Friendship affects the validity of the study: how some of the data are collected and reported.

- Friendship also brings both benefits and risks to the design activities.

Chapter 8

Methodological Reflection: Working with a friend

8.1 Introduction

The subject and the researcher are Malaysians living in Lancaster, UK. We both came here for our PhDs. When she took part in the first study[35] in April 2004, she had just been here for six months. At that time, I barely knew her apart from 'just as another Malaysian' doing PhD at Lancaster University.

In August 2004, she was chosen as the main subject in the subsequent study. The latter study which lasted about three and half years has inevitably affected our relationship: we became much closer.

This chapter discusses how the study has changed our relationship and how that friendship offers benefits to the design activities. Nevertheless, friendship has also affected the validity of the study such as the way data is

[35] The study on the use of the mobile phone was discussed in Chapter 1.

collected and reported (as previously discussed in Section 5.5 – Friendship Observation in Chapter 5).

8.2 Malaysian Community in Lancaster

The Malaysian community represents a minority ethnic group in Lancaster. Our population mainly consists of students, spouses, and children and is approximately about 100 people. Our population is considered small if compared to Malaysian communities in other cities in the UK such as in Manchester, Birmingham, Leeds, and Nottingham. Since we are smaller in number, we are generally closer to each other.

We have a society called Lancaster University Malaysian Students Society (LUMSS) that plays various important roles in organising and managing activities for Malaysians as well as being a formal communication channel for Malaysians in Lancaster. The Malaysian society often organises gatherings such as Eid and Chinese New Year celebrations and other 'get together' activities such as having barbeques and organising Family Day. The society also participates in activities organised by the University such as International Evening and Fresher's Week. Having lived abroad, we often look forward to going to these gatherings because for us, we see this as an opportunity to meet other Malaysians. This is because we do not always get to see each other very often due to our everyday commitments.

Having lived abroad, too, we make an effort to help our friends if they need one. For example, the society will email us about new Malaysians coming to Lancaster and ask if we can help them settle down. Very often, there will be some of us who will look for accommodations, and give away some of their

belongings such as duvets, pillows, winter clothes, and cooking pots. There will also be a Malaysian who volunteers to cook dinner for them, or buy them some groceries.

Similarly, if we need any type of help for example moving houses or looking for participants, we will usually inform and explain the type of help needed to the society. The society will then inform the rest about the help needed and follow-ups are usually done to make sure that those who need help get it.

8.3 How the study influences the relationship

The subject and I were merely acquaintance when she participated in the previous study. At that time, I only knew her as another Malaysian in Lancaster.

When she was chosen to be the main subject for the research, I had to get in touch with her more frequently. For example, the data collection techniques such as the diary and interviews made me 'keep coming back' to her for more data. And this has inevitably opened up more opportunities to know her better. As time passed by, she became a person better known to me. We have become closer friends.

Studying the subject has made me realise that it is the similarities between us and personal characteristics which have brought us closer.

8.3.1 Similarities between us

- Females

Women, from my personal experience, are more likely to share their lives with other women than men. We both are women. When we are together, we often talk about our personal lives such as our children, friends, studies, and shopping although the reason for seeing each other is for the study. If we do not see each other, we make an effort to talk on the phone, send text messages, or drop some lines on Yahoo Messenger. It is through sharing our lives together that I know her better. Floyd (1995) reports that women evaluate their closeness based on verbal interaction and emotional expressiveness. In a similar study, Elkins and Peterson (1993) found that female friendships are more therapeutic than male friendships because they are based more on intimacy and the need for conversation.

- Shared culture values and religious beliefs

We are very much similar – mothers, students, Malays, and Muslims. We are thus in many ways similar in our experience, beliefs, and evaluation of the world. More importantly, we understand each other better. Palisi (1966) suggests that people who identify themselves closely with their ethnic group have similar viewpoints on public issues. Telfer (1970) further adds that the shared interests or enthusiasms or views or a similar style of mind or way of thinking makes for a high degree of empathy.

For me, it is actually a privilege to be able to study a person who is very much similar to myself because I get to understand myself and/or other people who are similar, better. For example, studying how the subject lives

her everyday life helps understand how mothers who study carry out their responsibilities and cope with the expectations from many people.

8.3.2 Personal characteristics

- Researcher's attitude

It is a fact that no matter how similar we are to each other, we are both distinct, unique individuals. From the beginning, I was aware that the differences between us could 'push us away' from each other. I was also aware that if this had happened, I would not have been able to successfully complete the research.

One possible solution to maintain a harmonious relationship is to learn to deal with attitude and perceptions that I may have because of these inevitable differences. In the section 7.7, Lessons from friendship, the chapter will talk about a need for having a positive regard for the subject.

In addition, Meyer (1992) suggests that the inevitable differences between friends can actually shape the process of becoming friends. Melden (1988) further suggests that a friendship can be deepened if we start to appreciate that our friend has considerable life experience before and outside our friendship. The differences between friends actually help us clarify and deepen our own ideas about the world in general. Friends, however, value and promote the similarities, not the differences, between individuals.

Another way to maintain the harmonious relationship in a prolonged study is to care for the subject who has helped us in the study. The subject should be treated as a person who deserves to be respected physically and emotionally. Although caring for the subject can take various forms and is often

understood mutually between the researcher and the subject, I believe that it has to be made more explicit especially in a prolonged study like this research. This chapter will discuss more on caring for the subject in a later section.

- Subject's warm personality

The subject's warmth personality is another reason why we have become close. She always 'welcomes' her friends no matter how busy she is and this has made me feel that I am being appreciated and am ' a part' of her life.

Due to factors discussed above and as time went by, we became closer to each other. Because of close relationship, her role in the research has inevitably changed from merely being an informant to becoming a cooperative partner. From time to time, she would provide information and share her knowledge and experience to the research. I could see that she actually did it because she felt responsible for this research. Bjeknes and Bratteteig (1995) suggest that cooperative work between the subject and the researcher can promote full participation by both of them, enhance democracy in work practice, and improve the product quality.

The timeline of phases of research/friendship relationship is illustrated in Figure .

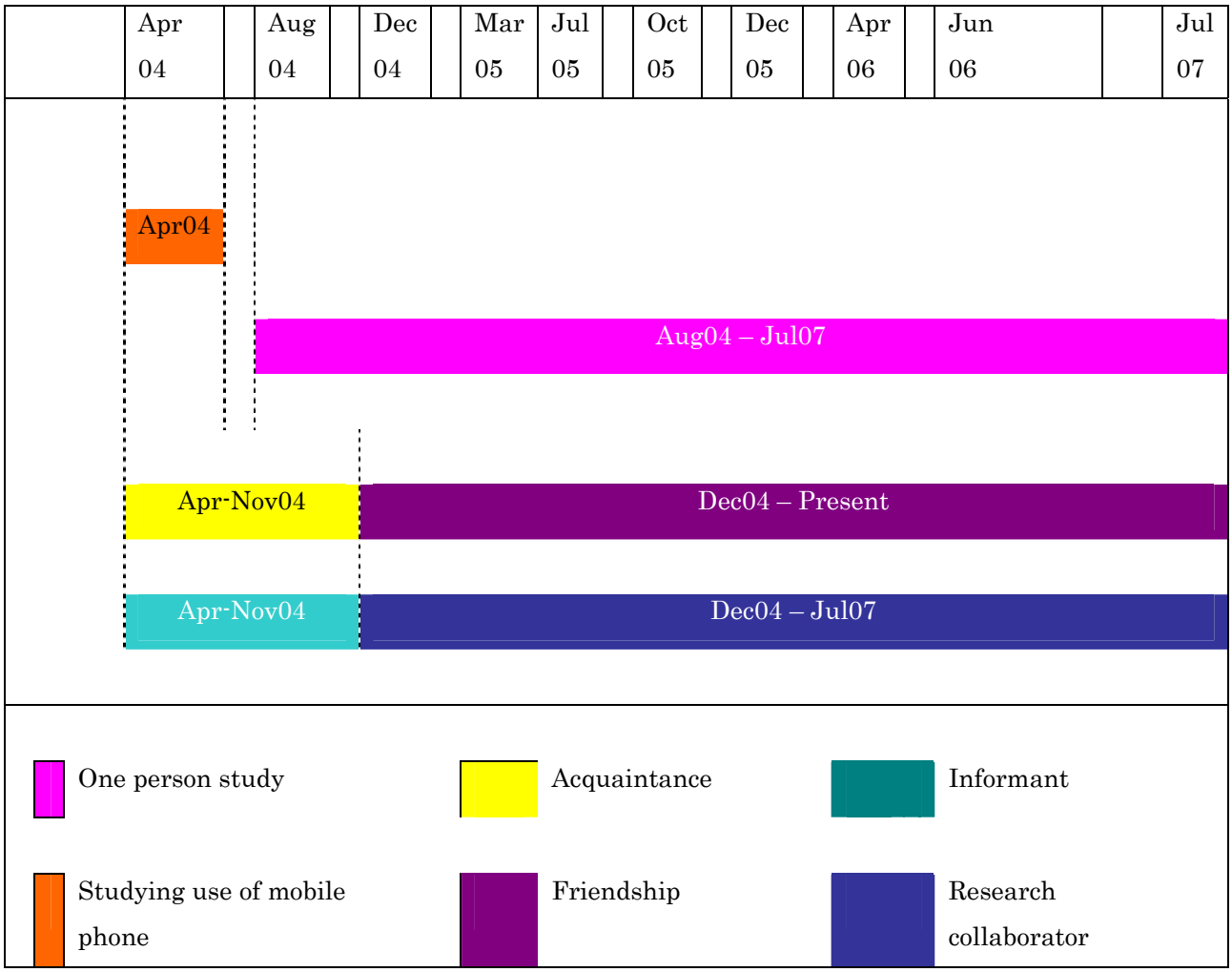


Figure 12. Diagram that shows how a relationship affects the subject's role in the research

8.3.3 Differences between the researcher and the subject

If the things had been different, it would definitely impact the research. For example, if the subject were male, personally, I would distance myself in the relationship because of my cultural and religious expectations. In Malay culture, a woman can work with a man but with some restrictions. These restrictions have something to do with the religious beliefs, Islam. Despite these limitations, as a researcher, I would still be able to know the subject better due to the study, but not close as a friend.

Similarly, if the subject was not as friendly and warm as KN, I might just have a research friend not a personal friend. Therefore, this would affect how I should design an application for the subject.

8.4 How friendship influences the validity of the study

The relationship has been over three years. We both know and understand each other well. Due to friendship, much of the interpretation of the data is influenced by the deep understanding as a friend. The deep understanding is gradually built due to our shared feelings and beliefs as discussed in the previous section – 7.3.1. However, this deep understanding brings both positive and negative effects, for example, rich data as well as personal bias.

8.4.1 Personal interpretation

In communication, understanding can never be perfect without assuming the following: Clark and other researchers (1986, 1989) suggest that the contributor and his or her partner have to mutually believe that the partner has understood what the contributor meant. This usually happens to people who have close or intimate relationships. In an intimate relationship such as friendship, we tend to have a similar way of thinking which makes both of us have empathetic understanding about each other. As highlighted earlier in the chapter, female friendship further makes the empathetic understanding towards the subject better. The mutual understanding, feelings, beliefs, and view points that we share which Clark (1981) calls *common ground* that has been built moment by moment for over three and half years.

Because of our similarities, it is unavoidable that I personally interpret her based on what I have known her as her friend. Cocking and Kennett (1998) claim that in friendship, we are "receptive" to having our friends "direct" and "interpret" us. They say that to be interpreted by our friend is to allow our understanding of ourself, in particular of our strengths and weaknesses, to be shaped by our friend's interpretations of us. They further claim, "the self my friend sees is, at least in part, a product of the friendship" (Cocking & Kennett, 1998).

Another feature of friendship that leads to personal interpretation is the subject's personal characters. As our relationship got closer, I noticed that she became more open about her views, thoughts, and suggestions for the research.

In friendship, openness goes beyond a simple willingness to tell the truth (Meyer, 1992). It is a disposition to be straightforward about it. Because of this, there were times, as her friend, I did feel offended with her comments. For example, the feedbacks that the subject gave for the prototype developed in Chapter 7. The comments such as "like a school teacher" and "Don't need to tell me what to do because I myself know what to do" can be hurting. However, as a researcher, I believed that she only did it for the sake of the study.

Having said the above, we are actually selective in the ways in which we allow our friend to interpret us and we can resist other interpretations because we perhaps recognise the truth of our friend's interpretations upon ourselves. We somehow tend to accept it because she is our best friend who we believe knows us better.

However, in research, personal interpretation can raise reliability issues that can affect the validity of the data. While data interpretation should be rigorously done such as reconfirmation and triangulation of data, it is harder to do with this research methodology which largely depends on friendship.

As discussed in Chapter 5, as a friend, we generally do not seek confirmation from our friend to double-check our interpretation of her. In fact, from my experience, seeking a confirmation about her feelings or behaviours may not be a good idea after all. As the researcher, I had once asked the subject about her feelings. The intention was to make sure that what I understood about her was true. I however received a surprise look from her. She said, "You should know it yourself". At that moment, I personally felt that I 'failed' as her friend. It was probably because she saw me as her friend, not as a researcher, at that time. Chapter 4 discussed that how a dual role can become blurred. In this case, I was being a researcher when I asked her the question. However, she personally saw me as her friend because I did not mention to her that the question was for the research. Here, I took for granted that she would remember what I had told her earlier (as mentioned in Chapter 5 in Friendship observation) that I would study her from time to time for the research.

8.5 Ethical issue

While friendship undoubtedly offers benefits, it does inevitably raise some important ethical issues that may affect the reliability of the data collected and validity of the study.

8.5.1 Taking advantage

As a friend, we can seek certain provisions in our friendship as suggested by Sullivan (1953), Weiss (1974), and Furman & Robbins (1985). These features among other things include seeking help from a friend. Berndt (1999) further adds that this type of assistance expected between friends is often unilateral rather than mutual. Similarly, for this research, I had expected that she would help me if I ever needed her help. Because of this expectation, I may assert my dominance indirectly over her for my sake without really thinking about her situation at that time.

I however argue that our religion and culture further add to this expectation. Islam, for example, requires its believers to help another Muslim brother or sister. One Hadith that says, "A Muslim is the brother of another Muslim, and a brother does not leave his brother helpless nor does he lie to him nor yet makes false promises, nor treats him with cruelty" (reported by Tirmidhi). In Islam, it is the right of a Muslim to seek help from another Muslim, and it is obligatory for a Muslim to help her sister[36] until her needs are met. Furthermore, it is a custom in Malay culture to help each other if one is in difficulty. The expectation to receive help from a friend was even higher in my situation because she was the main subject for this research.

In a friendship, the subject's act of putting my priority first before hers is actually an act of self-sacrifice, which may only occur in a close-knit community like close friends (Finnis, 1980). In the words of Lawrence Blum's (1980) account of friendship, friends have "a disposition to act to foster [the good of the friend] simply because the other is one's friend". Friendship involves special duties: duties for specific people that arise out of the

[36] Sister or brother in Islam refers to another Muslim.

relationship of friendship. Annis (1987) suggests that such duties "are constitutive of the relationship" of friendship (p.352): meaning that we have to aid and support our friends that go well beyond those we have to help strangers because they are our friends.

Although we can claim our 'rights' as a friend to seek help from our friend, we sometimes might get carried away with this claim. We thus might take advantage of our friendship for our own goods. For example, since I knew that the subject would be willing to sacrifice her time to help me, I often expected her to be able to help me each time I asked her. If she could not help me as what I had expected, I would feel hurt or betrayed. The closer is the relationship, the greater is the expectation for help. However, we ought to learn to put a limit to this expectation, meaning, to what extent that we are allowed to expect such help from a friend

8.6 Benefits and risks of friendship in HCI

Friendship potentially offers both benefits and risks to a system development project. Benefits can improve the quality of working as a team, therefore, can increase the quality of the product. However, the risks can jeopardise the existing relationship between team members and the project could be abandoned.

The following discusses possible benefits and risks of working with friends in a system development project.

8.6.1 The benefits

- Richer, more accurate data

Chapters 6, 7, and 8 have discussed KN in detail: Chapter 6 discussed her use of mobile phone and text messaging, Chapter 7 discussed her everyday life, and Chapter 8 described her personal characters. Studying one's own friend helps yield rich data. This data produced are more extensive and accurate than the one produced by survey methods.

- Empathy

Friendship helps understand the subject as a person she is. For example, Chapter 5 describes the subject from aspects of personal characteristics, beliefs, emotions, and values. These personal properties can not be simply gathered from a short term interaction such as in the surveys, interviews, or even from direct observation. Based on deep understanding of a friend, I as the designer was able to design a prototype that works for other people as shown in Chapter 7.

- Less stressful working atmosphere

As we were friends, we often talked about personal topics alongside our work. It somehow made the work less stressful. We often started with personal conversation before we did our work. The conversation was often spontaneous and without direction. Although we often got carried away with it easily, we felt free and unrestricted. Jokes and teasing further made us comfortable with each other and thus, we felt less pressured with our work. This research became something that we often looked forward to because we both saw an opportunity to be together again.

8.6.2 The Risks

Working with friends, however, is not without risks. Some of the potential risks are:

- More time to finish

While we may enjoy each other's company, we sometimes do not realise that the time taken to accomplish the work might be longer because of spontaneous conversation which often occurs without direction. For example, it took four interviews[37] to gather data about the use of mobile phone alarm and text messaging from one person, which I believe could have taken less hours with a person whom I do not have intimate relationship with.

- Friendship in jeopardy

Sometimes we might disagree with our friend's view. The difference in personal views or beliefs, if we are not being careful, could lead to an unexpected argument. The impact can be worse than it is with a stranger because the argument may lead to personal attack, for example, we start to criticise and judge our friend, which may not be true.

It is also true with comments. Although we appreciate comments or feedbacks from a friend, the truth is that we are often hurt by her genuine comments. This happens because with friends, we often say things more openly because we always thought that our friend could take it. Some of the feedback I got from friends hurt me deeply because personally I thought I had done my best. However, I tried to reconcile these feelings because I knew my

[37] Approximately about four hours in total.

friends would not mean to attack me personally: they were simply giving their frank, honest comment which could improve the study. As the subject said, "I know you could do better than this one".

- Threats to validity

Previously in Section 8.5.1 we have discussed personal interpretation as a result of friendship. Although it is unavoidable, it may pose some threats to the study. Personal interpretation due to friendship may affect the validity of the study: we seldom bother to reconfirm our interpretations simply because we think that we know her better. This has been highlighted in Chapter 5. Chapter 5 has also discussed some possible ways to minimise the threats to the validity.

8.7 Lessons from friendship

Suggestions on establishing personal relationships (e.g. Bandow, 2001) and building effective personality (e.g., Teague, 1998; Gorla & Lam, 2004) in the system development have been discussed a lot in Information Systems (IS) literature. In various literature, informal communication (e.g., Kraut et al., 1988), rapport (e.g., Guinan, 1986; Boland, 1976), and trust (e.g., Hiltz & Shea, 2005) are some of factors that can strengthen relationship between team members.

- Having a positive regard for the subject

Managing self-awareness helps underpin other skills involved in working with another person. Self-awareness can be achieved by being able to

recognise our own emotions and their effects. Thus, it is important to have a positive regard for the person whom I am dealing with. Rogers (1961) emphasises that 'unconditional' positive regard requires a degree of self-control and discipline. It is about being able to recognise how I am going to react to cues in the environment and how my emotions might affect my interaction with the subject.

From personal experience, caring for the subject for her sake is an important skill that can be adopted from friendship. Caring is actually a product of empathy.

- Caring for someone

Caring is a necessary condition of friendship (for example, Telfer, 1970; Annas, 1977; Annis, 1987; Thomas, 1989; Friedman, 1993; Whiting, 1991; White, 1999). Friends care about the other and do so for her sake. In fact, caring should be a necessary condition of any relationship. Although there is considerable variability as to how we should understand the kind of caring involved, there is widespread agreement that caring about someone for her sake involves both sympathy and action on the other's behalf.

The importance of caring about someone who has helped with the work should be greatly emphasised especially the person has been involved in a long term project. This is to ensure that she feels appreciated as a person – as opposed to being a subject - and thus, motivated to stay on the project until it is complete.

8.8 Conclusion

When we work with other people on a long term project, our relationship may change as we become friends. We have chances to get to know each other better and learn to compromise the differences between each other. Some features of friendship such as the empathetic understanding of the subject and the subject's openness and sincerity can affect the validity of the research. The main advantage of friendship is that we can empathise with our friend as highlighted in Chapter 7. Furthermore, working with friends helps minimise the possible stress in the working atmosphere and helps us to manage relations with people in general. However, there are risks associated to friendship in the study such as it poses threats to the validity of the study, the study may be prolonged, and disagreement may jeopardise the friendship.

Chapter 9

This chapter highlights the following:

- Summary of the thesis
- Strengths and weaknesses of the research
- Research contributions to HCI
- Suggestions on future work

Chapter 9
Conclusions

9.1 Introduction

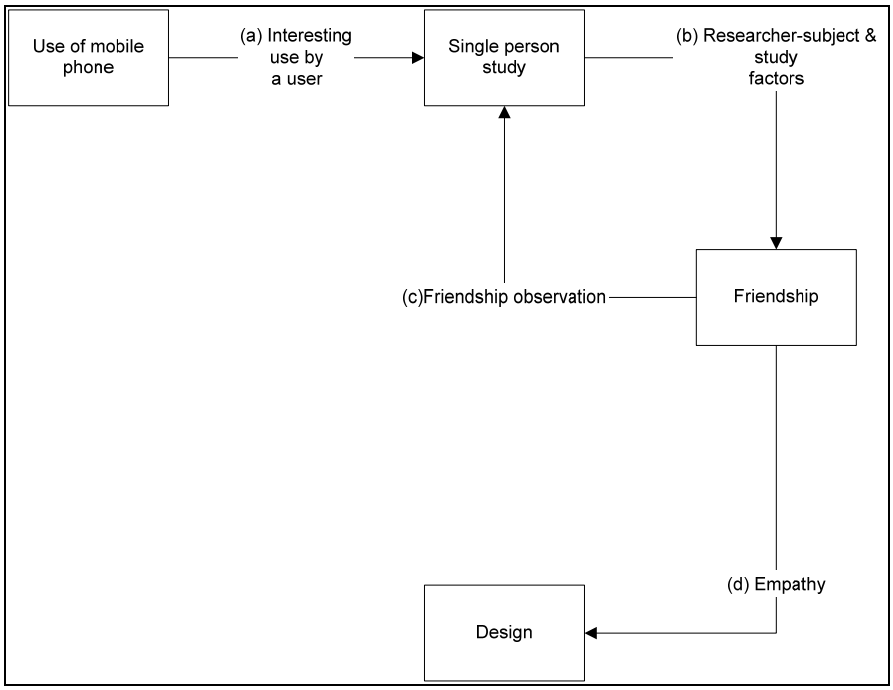
The thesis is about single person study and methodological issues surrounding it. Single person study emerged as a result of an interesting use of the mobile phone by a user. Due to a prolonged study of the person, the researcher and the subject became friends. Their friendship inevitably affects the study: how some of data are collected and reported. While friendship raises some ethical issues that affect the validity of the study, it has potential to provide benefits to design in general.

This chapter concludes the thesis with the summary of the research work, a discussion on the strengths and weaknesses of the research, the research contributions to HCI, and some suggestions on future work in the similar area.

9.2 Summary of the research

The diagram below, adapted from Figure 1.1 in Chapter 1 but presented in more detail, summarises the relationships of the activities in a single person study.

Figure 13. Summary of the thesis



a. Single person study emerged as a result of an interesting use of the mobile phone by a user: she often used her mobile phone alarm as a time management tool. Chapter 1 discussed this.

b. Due to a prolonged study of a single person, the researcher and the subject became friends. Chapters 5 and 8 have discussed how they became friends. Factors such as gender, similarity, and personality play important role in the establishment of this friendship.

c. Friendship inevitably affects the way some of the data in this research were collected and reported. Friendship observation is a term used in this thesis to describe how some of the data were collected and reported based on what the researcher knew about the subject as her friend. This observational technique, however, raises some ethical problems to the research as discussed in Chapters 5 and 8.

d. Despite these ethical issues, friendship has potentials to bring some benefits to design activities. Chapter 7 has discussed how shared understanding, feelings, and beliefs have affected the design decision. Empathy is often a result of shared feelings with the subject, and indirectly affects the way the designer made design decisions for the subject.

9.3 Strengths of the research

- Studying a single person allows for an understanding of things which would or could otherwise be overlooked with a group study. Chapter 6 has discussed how a mobile phone alarm becomes an important time management tool for a mother who has to divide her time effectively to carry out her everyday commitments. Chapter 6, too, discussed her reasons for using text messaging as a friendship tool. Deep understanding of KN has affected design decisions: understanding struggles in her everyday life (Chapter 6) and her emotions on certain text messages (Chapter 6) led to designing a prototype called Personal Motivator (Chapter 7).

- Generalisations are possible from a single person. Chapter 7 has shown that studying one person helps understand and therefore design for some

other people. Deep understanding of an individual is achieved through friendship which was discussed in Chapter 8. This understanding can further be applied to understand other people who are personally similar to the person studied as shown in Chapter 7.

- Studying a single person offers an opportunity to learn new things about the domain, not simply test existing ideas of knowledge. Chapter 8 described specific person skills that can be learned and developed when dealing with a single person in 'Lessons from friendship'. These person skills are needed especially if we have to deal with a specific person for a period of time as it was the case in this research.

  In addition, studying a single person does help understand that person deeply. Chapters 6 and 8 have described how deep understanding can be achieved: Chapter 6 talked about being similar and Chapter 8 talked about friendship. This deep understanding is known as empathy. Empathy affects how a designer might design for a person or a group of people as shown in Chapter 7. The shared understanding, feelings, and beliefs with the subject have eventually designed for other people who are similar.

9.4 Weaknesses of the research

- A single person study could be more expensive to carry out than a group study. In design, the amount of available resources is usually restricted. In one aspect, studying a single person seems easier to do than studying a group of people because we just need to deal with one individual. However, in order to achieve deep understanding about a person, we must

be willing to spend a lot of time with that person. As an ethnographer, Spindler and Spindler (1992) say, "We must observe these happenings often enough so that finally we learn nothing significant by their occurrence". Due to its time consuming nature, studying one person can be more expensive although it potentially offers benefits in the design process.

- Outcome of a single person study could be different if the person studied is personally different. In this research, the person studied happens to share a lot in common with the researcher, therefore, they became friends. Due to their shared experiences, the researcher was able to empathise with the subject and this affected the design decision. However, if the person studied is completely different from the subject, the outcome of the research could be different. Chapter 8 has discussed how the differences could affect the interaction between the researcher and the subject due to restrictions imposed by certain personal factors such as the cultural and religious beliefs. Friendship may not then be a result of the in-depth nature of this single person study. This would definitely influence the design decision leading to a different type of application being produced.

- Friendship potentially raises ethical issues for research as discussed in Chapter 8 such as personal interpretations and taking advantage of a friend. This happens because they are 'parts' of nature of friendship.

- Friendship can influence the validity of the study because some of the data reported is based on personal intuition and interpretation. The researcher can be criticised for personal bias. When a researcher becomes a friend with a subject, it affects how some of the data are collected and reported. Chapter 5 discussed how some of the data were collected, i.e. information in the interviews was just jotted down and was later

interpreted based on the researcher's personal knowledge about the subject as a friend and Chapter 7 discussed how personal interpretation is built up based on friendship.

9.5 Researchers to conduct single person studies

This thesis has suggested a methodology as the following for studying a single person:

- Choose a subject based on a sampling technique
- Decide a research strategy
- Collect data
- Analyse and report the data

An outcome of this in-depth study is friendship between the researcher and the subject.

This research was conducted by a mature postgraduate student who possesses good person skills. The subject, too, happens to be someone who is also good with people. As a result, friendship is formed between the researcher and the subject.

To obtain similar results – friendship and empathy, it is recommended that a researcher to possess similar people skills: caring and enjoy working with people. If this study is to be replicated by a young researcher who is less mature and person-centred, she or he may get a different result – perhaps the relationship is mainly about work, therefore, little about emotional and personal connections with the subject studied.

9.6 Contributions towards HCI knowledge

This thesis is able to add the following to the HCI society:

9.6.1 Domain

- **Use of mobile phone alarm as a time management tool**

Chapter 6 explained how the mobile phone alarm can serve as an effective time management tool that can help remind a person of her routine activities. The mobile phone alarm can be a practical tool for a person like the subject, KN, who wants to carry out her responsibilities effectively. This understanding adds to the existing knowledge of the use of the mobile phone alarm.

- **Texting as an emotional support tool and mini-breaks from everyday routine**

Chapter 6 has shown that short text messages can provide emotional effect on a reader. Examples of such text messages are:

Dear God
Don't need lots of frens! As long as real ones stay with me, so bless them all, especially the sweetest one reading this.

And

Thank u dear

These messages are very brief, yet full of emotion. KN said that it is something that she cannot say over the phone. For her, texting can be more emotional than phone calls.
Text messaging, as KN suggested, is able to pass our 'thoughts' to our friends without saying a lot of words. For her, text messaging was like "I remember you" or "thinking about you" without having to interfere with one's everyday life. She believed that in order to be in touch with our friend, we didn't need to say a lot. We could simply pass our "thoughts" to her. She said, "It is like a greeting card. It is like a gesture from you to your friend."

In addition, texting a message can also mean that she is taking her mini breaks from her everyday routine. She said that while she was busy studying, she sometimes thought of someone whom she did not see for a while or something that needed to be done quickly. So texting someone a 'Hi' or 'Hello' can be done while she is doing her work.

9.6.2 Reflection on methodology

- **Single subject study**

The single person study in this thesis has surfaced as a potentially valuable method in a user study. Single person study is able to produce rich data (as shown in Chapter 5 and 6), help understand oneself better (Chapter s 5 and 6), identify uniqueness of a person (Chapter 5), and help oneself grow as a researcher (Chapter 7) and a designer (Chapter 6). Due to a prolonged study of a person, the researcher and the subject become friends (Chapter 7). Friendship affects the validity of the study both positively and negatively as discussed in Chapter 7.

- **Friendship observation**

Chapter 4 discussed an observational tool called 'friendship observation' based on an understanding of a friend. Chapter 7 discussed both positive and negative effects of friendship on the study. Benefits include more accurate data, more extensive data, empathy, and less stressful working atmosphere. Meanwhile, the disadvantages of friendship are that we might take more time to finish a project, disagreement may jeopardise friendship, and it can pose threats to the study.

- **Empathy**

Deep understanding of a person is achieved through friendship in this study. Friendship enables the researcher to understand the subject's feelings because both the researcher and the subject share similar experience and beliefs, therefore, they can understand each other better. Chapter 6 has shown how understanding of KN in her everyday life and her use of text messaging help design Personal Motivator.

9.7 Future Work

This piece of work can be extended in the future with the following suggestions:

9.7.1 Evaluate single person study

Although this thesis has shown that single person study can help generalise other people, we still do not know whether single person study is an appropriate choice for user studies.

What we can suggest is that:

- Replicate the single person study in other areas.

- Analyse the kind of domain, problem, methodology, etc. that makes single person studies work.

- Produce a matrix table that can serve as a guideline for the designers in deciding on a type of user study which is more appropriate based on her requirements.

9.7.2 Evaluate the impact of friendship on the study

This thesis has highlighted the advantages and disadvantages of friendship in the study. Nevertheless, we do not know whether a researcher can be friends with someone who is different from herself. The future work could replicate the same single person study but with a different person from the researcher.

So far, we have known the impact of friendship on two people. What we still do not know whether it is a good idea to establish personal relationship with more people as it is in a design team and the consequences of this personal relationship could have on the team in general.

One suggestion is that try to apply the guidelines as stated in "Managing relations with the subject" in Chapter 7 when dealing with people in the team. From here, we may propose what works and not in being friends with many people as opposed to only one person and whether empathy is a result of this type of friendship.

9.7.3 Design a manual based on a single person

This is less of a research but more of a practical work. This practical work is based on an understanding of the method in 9.7.1 and 9.7.2.

This thesis has shown that a prototype on a single person works for some people. Other single person studies in HCI also show similar results. But we do not know whether a manual designed based on a single person works for other people in general.

The future work could also focus on developing an instruction manual or detail guidelines based on understanding of a single person including type of wordings, terms, and language. This manual would later be tested on a more diverse group of people.

9.8 Conclusion

In many cases, experimental method requires ten or more participants and usability evaluation as Nielsen (2001) suggested requires at least five users. However, this thesis has shown that in some situations, just one subject might be sufficient to learn new things and propose niche designs. Although there is more research to do, this thesis has shown that single person study can be at least a promising method delivering benefits such as friendship observation and empathy design.

APPENDICES

APPENDIX A

DIARY OF THE SUBJECT

Day 1 : 4 August 2004 (Wednesday)

Am:

Early morning I was alerted with an sms from a friend I seldom keep in touch with back home in Malaysia. Sent me such a sweet sms I thought. Sms reads :

Dear God
Don't need lots of frens! As long as real ones stay with me, so bless them all, especially the sweetest one reading this.

This sms MAKES MY DAY!

Am / pm

Received a call from a colleague….needs to discuss some crucial matters. Thought of discussing matters on fixed line phone but a household member was awaiting important call…so we decided to carry on discussing via mobile due to caller's kind willing gesture.

1.0 pm

There was great news needed to relate to a friend and so sent an sms and so glad received instant reply and response to it.

11.30 pm

needed to inform a friend of a direction route but as it was too late…I sent a text trying hard to squeeze directions into one text.

12.00 am

received a text from a friend who had great news to share and as I was still awake managed to respond to the sms. Friend was shocked and glad as expected the sms only to be read the next day as it was already late!

12.30 am

As I was staying up, decided to send a text to my best friend back home whom I often chat with about work, study and all as she is also doing her phd study. Considering the time difference…it was easier to chat at this time…so sent a text to ask if she was available to chat . It's cheaper to chat than to keep sending sms and more fun as we get each other's response like talking on the phone which is even more expensive! Unfortunately….she was not available to chat….so carried on with my work instead. Before off to bed I then set alarm for tomorrow morning.

Day 2 : 5 August (Thursday)

Am

Alarm went off and accidentally switched it off and fell asleep. I overslept a bit as usually I'd stop the alarm but not switch it off. Then I'd leave the alarm on so that it alerts me again. It'd give me a little bit time to doze off before the alarm alerts me again.

10.30 am

Was already in my office at the university. As I had to run some errands during lunch time, had to manage time equally for me to do a bit of reading in the room and then off to the library to search for more reading references. Sets alarm to assist me with my time management and took my break at lunch time.

No sms mesagges received throughout the day. I only made a call to my house as I was going home for lunch.

Pm

Came back to my office and sets alarm again for time I should leave for home. Since there's no fixed line in my office I had to make sure the mobile is with me in case the kids call.

11.00pm

My husband sent a text informing that he's on his way back from work. What a relief!

12.19 am

My "buddy' friend from Malaysia had just sent sms to see if I could chat. It's good that I had the mobile next to me at this time. However, waiting for some time to chat on line…she sent a text to inform that her internet line was faulty.

Day 3 : 6 August (Friday)

Didn't think I had used my phone as much today except to just wait for a call from my husband. He was supposed to give me a ring once he's about to fetch me at the University. Informed him to give me a call before he leaves home so that I could prepare to 'wrap up'. Also told him to call again once he has reached university so just to avoid any waste of time. I was pretty busy today and didn't pay much attention to my mobile.! In fact I had a dinner night out with the family…had a good time…forgot about the mobile for a while. It was left all alone in my hand bag! Only time to sleep that I got hold of my mobile to set the alarm again.

Day 4 : 7 August (Saturday)

Am

Early morning when I woke up…routine I would always check any messages on my mobile coz there maybe people from back home (friends or relatives) who might sent sms or called. As there's a difference in time, they may have just sent or called. Fear that I may have not heard any calls while asleep , I always check the mobile the moment I get up every morning. One sms I received , fear it may be anything important or urgent ….was glad it was from an old friend who sent one of those sweet messages meant for a friend. Makes my day again , I guess! I usually do not reply to these kind of messages but treasure them of coz.

I made a call in the morning from my house phone. Since my address book was upstairs in the bedroom I used my mobile to search for the phone number (I was downstairs in the lounge) as I couldn't remember. Rather easy to do that but how I wish I can remember the number coz it's quite a

chore I feel to find the contact number – to key the alphabet and then to scroll down to search. I never liked to do this.

I went to my office to do a bit of work late afternoon. Was busy doing house chores before that so didn't bother much about my mobile though I made sure that it was somewhere nearby in case any one calls. But that was it. Not until I reached the office that I paid a lot more attention to my mobile. As usual…reaching the office, I will always first of all ensure that it's out of my bag and placed nicely on the table.

At the office I remembered that I needed to learn about some matter which could be found at that moment on the media. So sent a text to a friend to find out and managed to obtain the latest info. It was some kind of satisfaction for me. I shared the news with someone over here and I guess the person decided to give me a call on my mobile to discuss further about the news. We had really had a good chat about it!

Day 5 ：8 August , 2004 （Sunday）

Received a call but I just missed it. Right after the person who called sent a text to say that he called and included a bit of a reason why he called. The person also asked if it was a convenient time to call me. I replied to say that it was fine …and so the person called again. Thinking that I was in the house I was asked if the call could be made to house line instead but unfortunately…I was already out of the house…in fact in the car. As it was some kind of urgent matter the caller had to continue talking to me on my mobile.

Rest of the day, the phone stayed basically in my handbag….only took it out of the bag later. Later in the night I realized I had not seen my mobile. And of

coz I sort of misplaced it ….couldn't find. So in search of the mobile I had to use my house phone to locate where the phone was. Heard the ringing tone…somewhere under my bed ….must have fallen off that it went missing. Lucky coz the battery was very low and so I had to put it on charging.

Day 6 : 9 August (Monday)

On way to my office at about half eleven in the morning when I received a phone call from back home Malaysia. It was from my father whom I have not spoken to for quite some time. It was a wonderful surprise. Glad that he managed to get me on my mobile and also managed to speak to my sister so was really happy! Wouldn't be able to speak to them if they had called me on my house number.

I didn't actually use my phone as much today except to keep track of time as I left my watch at home. As I was busy after I got home entertaining kids and household matters…I didn't pay much attention or used my mobile. Since I was really tired I decided to go to bed early and set the mobile alarm to wake me up pretty early so that I could do a bit of work!

Day 7 : 10 August (Tuesday)

As set by my alarm woke up very early. Before I started work I decided to send a text to my close friend back home just to find out how she's doing. I got her reply and like me she was in the midst of doing her thesis work. So it was good to know that we were both working at the same time though in different time zones.

Anyway…I went back to sleep and decided to have a 'sleep in' so I didn't bother to set the alarm this time. Got myself busy preparing household

chores before I left for Office – checked my mobile and there was a message from this close friend of mine who asked if I could chat but then the time difference was too late ! I missed her sms.

Since I received an email from another close friend this morning telling me how she's been busy coping with her mum who is ill, I decided to just give a short phone call. Managed to speak to her which was great. After putting down the phone I felt that I could give her some words of comfort so I decided to send her a text message. Hope she reads it and knows that I sincerely care.

I managed to get in to the office before noon. I later only used the mobile to make a call to my husband to inform that I was already in town and that he could come and pick me up.

The rest of the day……no sms, no calls but the mobile was with most of the time. Rather disappointing!

APPENDIX B

Interviews on Use of Mobile Phone

First Interview – August 2004

Researcher: How long have you been using your mobile phone?

Subject: About 7 – 10 years.

Researcher: How often do you use your mobile phone?

Subject: Several times a week – referring to making contacts to people such as phone calls.

Researcher: Where do you use your mobile phone most frequently?

Subject: Home and Workplace – place that I am doing my research work (university)

Researcher: Why do you use your mobile phone most frequently in the place(s) stated earlier?

Subject: Home – especially when my husband and the kids are not around, I have more time to be alone with my phone. This is the perfect time where I can access to messages – reread, reply, and/or forward messages. At home too I can do things like updating contacts in my phone book and discovering and learning any phone functions and features that might be new to me which might be useful later. I also often use alarm function to alert me like getting up in the morning, time to study, and time to "pamper" myself.

Office – when I reach at my office the first thing that I usually do is to take my phone out of my bag and put it on my table. I usually place it near me so that I can see it – I try not to miss any calls or messages; or simply as a

means for time reference. I also use it as a reminder – time to go to library and go home.

Researcher: What is the most common activity that you always do with your mobile phone?

Subject: I basically make phone calls, text messages, and use phone alarm and clock. I use text messaging more than I do calls because of the costs. It is cheaper to send text messages than making calls. I usually make phone calls from my house (landline) phone. I prefer to use text messaging because it is safer for me to contact someone, especially if I am not sure where he/she exactly is and what he/she is doing at the point of being contacted. This is to ensure that I don't disturb or interrupt him or her.

Text messaging is also used for initiating another activity for example, sending (or receiving) a text message to (or from) a friend asking whether she is (I am) available for chatting on Yahoo Messenger.

I also often use phone alarm for alerts for example, to get up in the morning and to remind me to pick kids up from schools. Since I have no clock in my office, I use phone clock as time reference.

Researcher: List activities in ascending order of how often you do them with your mobile phone.

Subject:

Text messages – usually send messages to and receive messages from family and friends. Texting is the primary function to keep in touch with family and

friends back in Malaysia because it works anytime, anywhere and it will reach you.

Alarms – as a personal reminder – to wake me up in the morning, to study, to fetch kids from schools, etc.

Phone calls – seldom but usually used for urgent matters

Contact updates – when I am done with my house chores I sometimes go through my phone book to check whether current contact information is still correct. I'll use this moment to update content of my phone book.

Since I always carry my phone wherever I go even when I am at home including in the kitchen, my phone becomes a source of contact information reference. Instead of referring to someone's contact number in a paper-based address book, I simply browse through phone book for contact information. The phone is always with me but my address book is always left upstairs in my bedroom. Rather than going upstairs just to pick the address book up, it is better for me to just refer to my phone book. It is there with me and even faster to access to requested information.

Picture taking – capturing "beautiful" moments of my children, especially when they are doing something funny.

Researcher: How important is your mobile phone to you as a personal tool?

Subject: Mobile phone is very personal to me. My phone is as important as my wallet. It is a valuable item – just like your ID card. You've got to have it with you all the time. You just can't lose it.

Researcher: How does having a mobile phone affect your life?

Subject: I feel more secured because I know that I can contact people and people can contact me in case of emergency. We'll never know what will happen to you or your family. If I forget to bring my phone with me, I feel insecure. If I don't have it with me I fear that people can't contact me and I can't contact them.

Researcher: What makes you become dependent on your mobile phone?

I depend on my phone more here in the UK than when I was in Malaysia because I have more responsibilities and commitments in my life now – I am a wife, mother, and full-time PhD student. When I was in Malaysia I usually used mobile phone for social activity such as maintaining and/or strengthening relationship with family and friends, and also for work-related activity, for example, finding out information on how to complete a task and asking for directions. Although I was busy with my work as a lecturer at a local university in Malaysia, my house chores were always done with the help from my maid. She helped me get my jobs done in and around the house. For children's welfare I hired someone who could teach my children the basics of Islam and who could provide private tuition to my children to supplement with knowledge they were lacking and/or what they needed to acquire necessary in order to be more competent at schools. Education system in Malaysia is very much exam-oriented. The children are often being evaluated based on the exam results they obtain: high score means children are good, otherwise, they are labelled as bad or stupid. Therefore, it is very common for parents to send their children for private tuition, just to make sure that their children excel in schools.

But now in the UK I don't have any maid to help me out with the house chores. I am manning things in and around the house all by myself. For example, as a wife and a mother I want my family to have proper meals everyday. As a mother I want to see my children excel in schools. Since there is no private tuition for school children at the place where I am living, I have become their private tutor – make sure that they do their homework and understand what they learn in schools. I also have to ensure that their knowledge is at least on par as other children of their ages. As a Muslim, I have to make sure that my children receive enough and correct understanding and knowledge of Islam. My children will never get this kind of knowledge at schools in this country. So it is my duty to make sure that my children receive all of these needs.

Although I do receive support from my husband and children to help get house chores done, there is still much of responsibility that I myself have to do it. For example, my family still depends on me for proper meals – breakfast, lunch (including school packed lunches), and dinner. Since my husband usually works from afternoon until night, it becomes my responsibility to pick the kids up from schools.

Only after getting my house chores done then I can finally concentrate on myself – my study and my life – social and private. I am living a busy life; however, as a human, I need to take a few short "breaks" from my hectic schedule, so that I can pamper myself or "get away" temporarily with my routines – to relax and/or be alone. That's why it is very important for me to effectively manage and organise my time so that I can balance my everyday activities between "what needs to be done" and "time to relax or pamper myself".

Second Interview – April 2005 (Revisit)

Method: Face-to-face interview
Place: Subject's office
Date: 26 April 2005
Time: 9:30 – 11:30am (2 hours)

Objective: to identify any changes in the current pattern of use of mobile phone in everyday life

Researcher: What kind of activity do you now do with your mobile phone? Any changes from the last interview?

Subject: The activities remain the same – phone calls, texting, and alerts. The only difference is that now I make more phone calls than last year because I have got more free minutes from my current package. However, phone calls are usually made if they are really urgent.

Although I also have free texts, these free texts can be only used with texts in the UK. The fact that I often send messages to my family and friends back in Malaysia, I will be charged for sending text messages abroad. Due to the costs I use less text messaging now than last year. Nevertheless, I still use more of text messaging than phone calls because I am used to texting – it is more convenient for me to send a text message to someone, especially if I haven't heard from her for quite some time. It is much easier to text "Hi" or "Hello" than talking on the phone. It is really not nice of me, having to call my long-lost friend just to say "Hi" or "How are you?" and then hang up. You just can't do that on the phone. It is rude. You've got to say more than that. You might end up talking more and you might completely forget about what you should have said in the first place. But you can simply pass your

"thoughts" to your friend with text messages. It is just like saying "I remember you" or "thinking of you" without having to interfere with her everyday life.

I still use alarm for alerts. I have no alarm clock in my bedroom. I use alarm to wake me up in the morning, pick kids up from schools, and take a rest. One thing about phone alarm is that it keeps ringing until you turn it off. You can set the time for alerts – like reminding you in 5 or 10 or 15 minutes from the time that you are supposed to wake up. Can normal alarm clock do that? Maybe I should get an alarm clock. Maybe not. Since I have a phone, I don't need any alarm clock at all.

Researcher: Do you find setting alarms a burden to you?

Subject: Setting an alarm is never a burden to me. In fact, it is a part of me – part of my life. You know that I have a lot to do a lot of work all by myself. Actually nobody asks me to do everything, but it is like "it is required of me to do it". I feel like I'm the one who should do it. My life now here in the UK is different from my previous life back in Malaysia. I already told you last time, right, I had other people who could help me out with my responsibilities. For example, I got a maid who helped me much with house chores, I hired a private teacher to teach my children Quran, and I sent my children for private tuition to make sure that they could excel in schools.

Now I am a student. I came here with one objective – to complete my PhD. But I have another priority in my life – my family. I just can't ignore them like that. They have sacrificed their lives for me – my husband quit his job and my children had to leave their comfort lives to follow me to this country. It is not something that everybody can do it. Although I am busy with my research work, I just can't simply neglect my responsibility as a wife and a

mother. That's why I feel compelled to do whatever I could to be so-called a good wife and mother. I don't want my family to feel neglected because of my studies. Although I do receive support from my husband and children to help me out with house chores, they are not always around at home. My husband usually works from afternoon until night. My children are at schools during the daytime. After schools they are often occupied with their own activities.

Although being surrounded with responsibilities, I still want to spice my life up with things that I enjoy doing like watching TV, chatting with friends, and pampering myself. Because of these I really have to wisely slot them in my life. I must know how to balance my needs between study, home, and leisure. Although I am not a TV person, I do watch TV programmes based on my interests – home improvement like Extreme Makeover and House Doctor, and soap operas like EastEnders and OC (Orange County). I will usually make time to watch them. Let's say that I want to take a nap before watching EastEnders. I'll set an alarm to wake me up so that I won't miss it. I used to ask one of my sons to wake me up for EastEnders but he didn't do it. Perhaps he knew that I can always watch the soap opera later at night (certain TV programmes are played more than once in a day). Or maybe he was just occupied with his activity that he completely forgot to wake me up. Sometimes, they did what they were asked. It is just that sometimes they are not just "dependable" or "reliable".

One thing about me is that I really value friendships. I have a set of friends whom I still keep in touch with: a friend from my previous workplace and two friends from my undergraduate years. Although we seldom "talk" to each other because of the distance and everyday commitments, we have made an effort to stay in touch with each other. For example, my friend from previous workplace always contacts me through text messages and Yahoo! Messenger. There are times when we need to "talk" to each other, she or I will first send

a text message asking whether I am or she is available for chatting. If both of us are free, then we will go to Yahoo! Messenger to have a chat. She and I have a lot in common: a wife, a mother, a colleague, and a student. Since we are both doing PhDs there are even more things to talk about and share between us two. Although I have a good time talking to and catching things up with my friend, I do need to control my social activity so that I won't get carried away. It's good to take some breaks from everyday routines, as my rewards, however, I need to realise that there is still more work to accomplish before the end of a day.

Appendix C

Interviews on Use of Text Messaging

First Interview – October 2004

Method: Phone call
Date: 28 October 2004
Duration: 1 hour

Objective: to find out reasons for texting and how she writes and understands a short message.

Researcher: To whom do you often send text messages to?

Subject: I usually send text messages to people whom I appreciate.

My friends – those who are close to me like my best friends. I still keep in touch with my friends from my undergraduate years – two of them. We seldom contact each other but we want to keep in touch – keep up with what we have been up to, etc. So text messaging is a means that bring us together in maintaining our relationships. There are other friends from UKM (my previous workplace) whom I also send text messages to, but, most of time I only send them a wishing message like "Happy Birthday". Again, this is just to keep in touch with my friends. There is a person whom I am very close to – my buddy – we share a lot of things between us two.

My husband – I usually text him a message because I don't want to disturb him at work. I try to avoid calling him at work unless urgent.

My siblings – once in a while – to find out how they are doing and what they have been up to.

Once in a while I do send text messages to other people whose numbers are on my phone book, for example, if I suddenly think of them or just simply reply to their text messages.

I choose people whom I want to send text messages. Not everyone on my phone book.

Researcher: From whom do you often receive text messages?

Subject: I often receive messages from my best friends. Since they live in Malaysia I usually receive only one message from them in a day. I do receive messages from other people, but they are not very often.

Researcher: What kind of messages do you often send to these people?

Subject: Messages vary depending on to whom I send messages to. If I send a message to my buddy (referring to my colleague at UKM), I can tell her about my supervisor, my studies, my family, my experience, etc. This friend of mine is also doing her PhD in Malaysia. Since we are both students now, we have more reasons to always keep in touch. We often talk about our experience, problems, lives, and families. We used to send messages like "I am seeing supervisor. Wish me luck" or "I have just been upgraded" or things like that. Mostly they are all about what we have been up to. Basically it is about keeping in touch with each other.

Three week ago one of my sons won an award in poem competition organised by Ottakar Bookstore. The competition was participated by school children from all over the UK. He won the first place in the North West area. I was so

happy and proud that I shared this with my buddy and my family back in Malaysia.

If I send a message to my work colleagues, I usually ask them about latest news of UKM. This is just keep me updated with the latest happening in UKM.

If I send a message to my parents, I'll inform them of my current situation. For example I told them about my new house address. My parents especially my mother, rarely reply to my messages. Instead of waiting for their replies, I'll prefer send a message that informs them news about us.

Researcher: What kind of messages do you often receive from these people?

Subject: If messages come from my best friends, messages are basically asking me how and what I am doing, informing me of good news, telling me about their family matters, or simply thoughtful messages like phrases and quotes.

Researcher: How is your relationship with the person you text?

Subject: Since I choose whom I send messages to, my relationship with them is very close. Of course I do send messages to other people whom I am not close to like my work colleague. But to keep in touch I only send messages to those who are very close to me like my best friends and family.

Researcher: Beside the cost factor, what are your reasons for using text messaging?

Subject: I feel that text messaging is the safest method if compared to phone calls, especially if you are not really sure where that person is, whether or not he or she is busy. In order not to disturb them or invade their privacy, text messaging is the best choice, just like emails. But unlike emails, as soon as he or she gets your message, they will reply to you more quickly than email since the phone is with them.

Since my phone is always with me, even when I am at home, it is much easier and more convenient for me to send and/or reply to text messages instantly than making phone calls (the cost will be more) and/or emails (I have to go to my bedroom, turn on the computer, etc – it takes longer time).

Usually with text messaging, people will ask a very specific question and the question is usually short. So it is easier to reply to this type of question – you also type a short but precise answer.

Another thing is that whenever I receive a text message, I am somehow compelled to reply to that message immediately. I can feel that the text sender wants a quick reply from me. My friend used to text me for a recipe – a traditional Malay dish that is usually served during an Eid celebration. I was in the kitchen when I got her text. Since the phone was with me I immediately replied to her request. I told her how to cook the dish instead. I did not text her the complete recipe such as ingredients and/or instructions for cooking. It just wasn't possible for me to type that on the phone. While I was telling how to cook this dish, I was very careful not to exceed the characters limit. I was trying very hard to explain to her in one page only. I usually do not send messages if they are more than one page long. That's why

if I ever have to write a long message, I'll try to squeeze all the words into one page only. I am not willing to pay for more charges of a long message.

Researcher: In what circumstances do you prefer to use text messaging?

Subject: When I am with other people or in a place that require a high degree of privacy like in a meeting or in a library. For me it is rude to have voice conversation in such places. You've got to consider other people surrounding you.

I usually use text messaging if I am not really sure whether a person that I am trying to contact is free or busy.

Another thing is when I don't expect a receiver to reply immediately to my message. This message is important but not urgent. For example, I used to text my husband asking him when he's coming home and whether I should cook dinner tonight. These are important for me but I can still wait for the replies. I know that he would reply to my texts whenever he becomes free or available, for example, during his breaks.

My phone is always with me. Sometimes I do have some questions or problems that I need to resolve, so by sending text messages "there and then" , can actually help prevent me from being "forgetful".

Researcher: How do you write a text message?

Subject: I usually use English – most of time. Sometimes I do use Malay language in my message. I usually abbreviate words – shorten the spelling but never shorten the sound of the word. In Malay language there are many

words that can be both spelled and pronounced shorter than the actual word. For example, "macam mana ni" (meaning what to do) has three different words, but they can be spelled and pronounced short like this "camne ni". They are modified both in sound and spelling. I personally don't like it. I think you should not change the sound to make it short.

I would make sure that sound of the words remains the same, only the spelling is affected like Bowland –-> Boland and the –> d. I would never write "dunno" to replace "don't know". It is not good because it can ruin the language and it also affects your spelling skills especially if you want to write formally.

I also use punctuation marks to express my feelings, for example, comma and exclamation mark. Sometimes I do use templates in my messages.

Researcher : Do you always understand text messages?

Subject: If I write a text message to someone, I'll make sure that my message is clear and easy to understand. However I never re-read messages before I send to people. That's why one thing about text messaging is that sometimes you said something which you didn't mean it but somehow the message got delivered to the receiver, the effect was even worse than spoken words because the message can be kept stored in your phone. It is there in your phone.

If I receive a message and find it unclear, I'll re-read the message to understand what the message really means. If I still don't understand the message completely, I'll try to get the gist of the message. I will not contact the sender just to find out what she really meant in her message unless that is really necessary.

Subject: Can you sense any human feelings in text messages? How?

I usually can understand their feelings through the words and punctuation marks they used in the messages. I often receive messages from people who are close to me. So I know them personally.

In my messages to them as well, I would express my emotions through words, punctuations to make them understand me.

Second Interview – April 2005 (Revisit)

Method: Face-to-face Interview
Place: Subject's office
Date: 28 April 2005
Time: 10:10am – 11:30am (1 hour 20 minutes)

Objective: to find out why she prefers to use text messaging and how she writes a text message.

Researcher: Despite the cost, why do you still prefer to use text messaging to phone calls?

Subject: It is more convenient for me to use text messaging than phone calls especially if I want to keep in touch with someone whom I have hardly heard for quite sometime. I just need to type a few words like "Hi" or "How are you?" and send it to the person. It is like "thinking of you". This is to keep each other in touch. To keep in touch you don't need to say a lot. You can just simply pass your "thoughts" to them. It is like a greeting card. I am often "touched" with passing thoughts. It is like a gesture from someone for you. It is just like an email, but it is more convenient because the phone is there with you. You can't have this experience with the phone calls.

If you try to contact someone with phone, you might end up talking more and you may forget about your initial intention – just to say Hi or Hello. Even if you wanted to say Hi or Hello, you just can't do that on the phone. Most of the time you may get carried away with your conversation. It is not that I don't like to talk to my friend. I just can't do that at the moment, but I want to keep in touch with her. Text messaging enables you to do that.

Sometimes you just want to say "mushy" stuff to your husband or best friends like "I love you" or "Thinking of you". Some people have difficulty to say that themselves. With text messages you can do that. Although some people still find it difficult to write it, you can simply choose one from the templates on your phone and send it off. I used to receive one of those from my husband. First I thought "Wow!!!" Later I found out that my husband actually used one of those from the template and sent it to me. Hey, that is okay. It is the thoughts that count.

Text messaging is like "your support" to your friend when you can't be there for her when she is in trouble. Although the message you gave to her is very brief, it can be full of emotion. It is something that you can't say it out over the phone. Sometimes you can explain everything without having to talk. For me texting can be more emotional than phone calls. Recently a close friend of mine gave a message telling me about his two-year old son who had a heart problem would undergo a surgery. She asked me to pray for her. I did. In fact I sent her a message during the operation, just to give encouragement and support for her. Since I couldn't be there for her, at least by sending her a message could somehow provide some hope for her. The heart operation was a success according to my friend. She texted me informing of her son's condition after the operation. I immediately replied to her message, telling her that I was really happy for her. Later through my other close friend, I found out that although the doctor successfully corrected the heart problem, the boy has now got a kidney problem, as a result of the operation. I felt so sad and sympathy for her. Then I sent her a text,

To: OGY

Sheela cald. Wil pray 4 emir

Later I received her text that says,

From: OGY

Thank t u dear

These messages are very brief but full of emotions.

Researcher: How do you write a text message?

Subject: You usually use abbreviation in my messages. I would make words short but the sound of the word is still the same. It is the spelling that I make it short. I often use English in my message. I am used with English; I use English in most of my messages including messages to my parents. I have never used Malay language in my message to them. I sometimes combine both languages: Malay and English in my message to a certain reader. It depends on the person as well.

I also make sure that my reader understands my message. I'll try to make it clear. I don't want my reader to say something like "What do you mean?"

Appendix D

Personal Motivator – Participants' Profiles

Name	Profession (at the point of study)	Description
P1	Full-time PhD student	☐ single but engaged ☐ often in touch with her finance through YM or text messages ☐ close and stayed with her twin who also did PhD at Lancaster University
P2	Full-time PhD student	☐ single ☐ close to her family in Malaysia ☐ often in contact with her family through phone calls and text messages
P3	Full-time PhD student	☐ a mother of two daughters aged 6 and 3 ☐ often in touch with her friends through phone calls and emails ☐ found that texting can be troublesome, therefore, she would only use it if she had to.
P4	Full-time PhD student	☐ single ☐ didn't always agree with things which didn't sound real to him ☐ only used mobile phone if he had to
P5	Full-time PhD student	☐ a mother of two kids, a son aged 6 and a daughter aged 5 ☐ appreciated advice and moral support ☐ down-to-earth ☐ warmth personality ☐ used mobile phone just to keep in touch with her husband
P6	Professional	☐ married with two children ☐ used text messaging for urgent purposes only
P7	Full-time PhD student	☐ a mother of a 3 year old boy ☐ quiet but very helpful ☐ positive thinking
P8	Full-time PhD student	☐ a mother of two boys aged 6 and 10 ☐ soft-spoken and gentle ☐ appreciated any good advice

P9	Full-time PhD student	☐ married but her husband lived in Malaysia ☐ no children yet ☐ warmth personality ☐ liked jokes
P10	Full-time PhD student	☐ single ☐ just started her PhD
P11	Full-time PhD student	☐ a mother with four kids ☐ her husband lived in Malaysia ☐ very close to her father ☐ independent ☐ worked hard for the family ☐ had her own standpoints
P12	Undergraduate, 3rd year	☐ single ☐ female ☐ quiet but helpful
P13	Undergraduate, 2nd year	☐ single ☐ male ☐ very helpful and dependable ☐ can be funny sometimes ☐ Can make friends with children easily
P14	Undergraduate, 3rd year	☐ single ☐ male ☐ appeared to be more religious ☐ can be dependable
P15	Undergraduate, 3rd year	☐ single ☐ female ☐ happy-go-lucky personality

Appendix E

Results of Personal Motivator (Detailed)

Day	Message	Participant	Feedback
One	Happy moments, praise God. Difficult moments, seek God. Quiet moments, worship God. Painful moments, trust God. Every moment, thank God.	P1	It's a nice reminder this sms. I feel enlightened in a way, knowing that im not alone as God is my confidant. Sometimes forgetfulness comes , so this kind of sms is a point to ponder about life.
		P2	First msg arrived as a nice surprise (because I already forgot that I agreed to participate in the study). Although the content was something that I already knew, but it was nice to be reminded of how I should always remember Allah all the time, especially during the month of Ramadhan.
		P3	Too long. The font size also too big. Have to scroll 3 times to finish reading it. Emotional: Touching. [in Malay] Mesti nak tahu siapa sender dia, scroll lagi and tarikh serta masa, kena scroll lagi. Bila too long to tend to make spelling mistake. Bila spelling mistake, makna pun kadang2 boleh jadi lain juga.
		P4	Er.. Not quite what I expected from this experiment, although I did feel it was going to involve some motivational material to see how I would respond, however I didn't expect it to be from a religious perspective. What I don't get is what you expect me to say? If the

			intention was to provoke a response on my beliefs - well it's not going to happen today.
		P5	This is a religious text message. In some ways it made me 'stop' from doing whatever I'm doing or slow down for a few moment to think about Allah.
		P6	*
		P7	It's a good message for someone who beliefs in God. As a Muslim, I would prefer a message that states the word Allah, it's more meaningful.
		P8	Although the message is long, it is however can be easily understood. To be more concise, preferably a short message will be helpful.
		P9	Message is too long though the content is nice. Timing and frequency of text is tolerable.
		P10	Good message. Remind me about God no matter I am in what situation. Always be thankful.
		P11	Too long. Not suitable for Non-believers.
		P12	I like the message. Very insightful thoughts and at the same time acts as a gentle reminder to me. Not too lengthy, yet very meaningful. Received at 3.45pm.
		P13	[in Malay] maksud die bermakne..memberi kesedaran betape kite perlu ingat tuhan..tapi saye rase, ayat die phrase die somehow mcm kelakar..but the point is there..people will get what we

			are trying to say..may be byk sgt gune word tue god kot..
		P14	It is a good message reminding me to remember God in every moment. A message that helps me to keep up throughout the day.
		P15	- delivered its points directly (I like this message) - made me ponder about life, e.g what have I done in the past, what need to be done in the future to make me a better person. - The wordings were simple to understand - No comment about timing - Message length was ok.

Day	Message	Participant	Feedback
Two	Do not wait for tomorrow for what you can do today, for tomorrow is another day. Do what you can do right away.	P1	I found this sms a little annoying with the repetitive words. I had a stressful day and reading this sms made me think of my work (which seems neverending).
		P2	It's amazing how the msg really struck a point, because I was thinking of putting off some programming that I should do that day until the next day! Was feeling a bit ashamed of myself, so I changed my plan (but still didn't manage to even start doing it that day because I spent the day struggling to learn how to program it by reading someone else's messy code instead)
		P3	Too long also. Font size big. [in Malay] Sebab suka juga dok tangguh keje nie. Mesti nak tahu siapa sender dia, scroll lagi and tarikh serta masa, kena scroll lagi.
		P4	Okay now your meeting my expectations of this experiment, cue motivational material - shame I never pay attention to it, even when I'm the one quoting it to myself. I'd write more but as the text states - this can be put off to another day, being of little consquence to me. Oh the irony.
		P5	It's more like a motivational kind of message, and quite appropriate given the situation I am in at the moment. The

			message is also very familiar.
		P6	*
		P7	It's a good reminder message.
		P8	The message is clear and easy to decipher. This will remind us that a quick action is essential.
		P9	Again message is too long. Content not really favourable. Timing and frequency (2nd message) is still tolerable.
		P10	Blank, can't think anything when received the message. Read twice. It reminded me to do my appending work right away, good message in early morning.
		P11	Too long. Can be simplify by saying Do it as soon as possible. ASAP.
		P12	I like the message. Short and precise. Shows the importance of time and not to delay things. Received at 10.14am.
		P13	[in Malay] saye kene bace byk kali msg nie..sbb die berbelit2..kene pikir lame skit...may be phrasing die kot yg mengelirukan..lagi pulak..ayat die mcm tak de sequence..but people will understand..
		P14	A message that comes at the right time, since I'm struggling to start my study for exams. Thanks!!
		P15	- I was a bit annoyed when I received the message because I was hanging out with my friend as well as getting few different

			messages during that period. - Since I was annoyed, I didn't bother to read thoroughly the context of the message. Basically just run through it and completely forgot to read it again later that day.

Day	Message	Participant	Feedback
Three	Focus on where you want to go, not on what you fear.	P1	The motivational and positive aspect of this sms appeals to me since I like things that enlightens me.
		P2	Another nice relevant reminder. Doing PhD was definitely something I used to fear. Actually, it still is. Reminded by the msg, I made a mental note to remind myself from time to time to think about the reward that awaits me (a nice job) every time I get the panic attack of what-if in the future.
		P3	Much better. Short and meaningful. *Not saying that others not meaningful. Too long. Unless it is an important message such as "Balik lambat, beli makanan dulu". This kind of message will affect you when given by somebody close to you- close friends, husband, closed relatives. If given by anonymous I would not be bother but little bit touch of the thoughts.
		P4	A somewhat weak

			motivational expression. Has no bearing on my day.
		P5	Another motivational quote.
		P6	*
		P7	Unclear of the meaning.
		P8	Not very clear. The first remark does not have a strong link with the second one.
		P9	Don't like the message. Content too general to be sent. Read the txt much later as during that time busy for lunch.
		P10	Don't really understand
		P11	The first line and the second is not related and could not understand what is the actual meaning.
		P12	Not sure whether I like the message or not. A really short message. But, couldn't really get the meaning of it. Received at 2.21pm.
		P13	this is straight forward..easy to remember..i like it..
		P14	Simple message that describe it all about your goals in life.
		P15	- Really short message. - Easy to understand. - Timing was ok but again wasn't concentrating on the message as I was out with my friend. - However, again the context is straightforward. Suitable for boosting confidence.

Day	Message	Participant	Feedback
Four	If God can turn night into day, He can turn a burden into a blessing.	P1	I deleted this sms to make way for my personal sms-s. It was taking up the space in my mobile. I think these sms-s are given too frequently…I prefer the frequency to be once a week. Or else it would be annoying.
		P2	The 4th msg in four days. I knew it's coming, so it was definitely not a nice surprise reminder. And the fact that the content was something that I already knew, at the end of the day I barely remembered what the content was.
		P3	The message receive now at the moment does not mean anything. I think because I know that this is an experiment. It do give me a smile and a touch in my heart, but that is it. the message structure short. One screen.
		P4	These messages have really no bearing on my day whatsoever and so commenting on them is becoming quite tedius. As for this message it's nonsense - how does turning night into day compare to the skills needed to turning a burden into a blessing? And what's with the God reference - Man reached this technology know how several years ago (Russian mirror satelite, okay it didn't work as prescribed, but space projects have a tendency to take a while to work successfully), so this

			expression really needs updating, if not disbanding since controlling the heavens has nothing to do with soothing a person's sorrow.
		P5	I think this is the nicest message of all. In ways that I cannot explain, this message kind of summarises all the other six messages.
		P6	*
		P7	Prefer a message relates to Allah from Al-Quran or Hadith.
		P8	Clear and easy to understand.
		P9	Like the message. Content is not common. Short and not dragging.
		P10	A great message received when I was in a difficulty situation, struggling with my work.
		P11	Meaningful but only to the god-believers.
		P12	I like the message. God is able to do anything within his will. Received at 12.35pm.
		P13	[in Malay] i like it..its really meaningful..easily understand and bawak maksud yang mendalam kalau utk org yg dlm kesusahan..hehe..
		P14	Reminder of God's existence and reminder to seek for His help and forgiveness for any difficulties.
		P15	- I was starting to feel bored with the message context as it's just similar to previous messages. - However, the context is

			précised with short sentences. - Easy to understand

Day	Message	Participant	Feedback
Five	Don't be afraid of making mistakes, but do be afraid of making the same mistakes.	P1	I agree with this message. Great reminder..
		P2	My mind was fully occupied worrying about the problem with this week's tasks. I am making mistakes all the time. Making the same mistakes to be more precise. It didn't help to be reminded at a moment like this that making the same mistakes is a mistake!
		P3	Same as number 4
		P4	Making the same mistakes is not something I'm particular afraid of, it's something I actually do once in a while as I can't remember every little mistake I've ever made in my life to avoid doing it again. All one can hope for is that continually enforcement of that mistake and learning from it will create a mental block from doing it.
		P5	My feelings: indifferent, because they are quite common.
		P6	*
		P7	It's a good reminder message.
		P8	This is the most understandable message. I personally like this message.
		P9	Don't like the message – common. Feel disturb for receiving not relevant txt not really useful.
		P10	I was reading my email when I

			received the message. I don't have any comments. But read again afterwards to get the message.
		P11	Very meaningful. Easy to understand and more apply to everybody.
		P12	I like the message. It's surely a nightmare when you're making the same mistakes over and over again. Received at 12.57 pm.
		P13	straight forward..i like it..
		P14	No words to describe the meaning of this message.
		P15	- Again, feeling annoyed receiving this type of messages, for example like messages send by a mobile network informing about their offer and etc. - But I like what the message is trying to say. It's more like an advise (in a "tersirat" way). - Precise and short. - Receiving timing kind of similar to previous messages. When my mobile alert me about there is a new message, I was kind of expected to get this message especially when I hardly received other messages from other people.

Day	Message	Participant	Feedback
Six	It is not how much you do, but how much love you put in the doing.	P1	True true,….such irony when it comes to my phd work.
		P2	The msg arrived when I was impatiently waiting for a reply msg from my sister. When I realized it was not from my sister, I was disappointed and didn't really pay any attention to its content.
		P3	-lost it
		P4	Yeah, the motto works all the time when your working to a deadline, NOT. In the world of research it seems that the amount of effort one puts in is immaterial to the amount of papers you can knock out of it at the earliest possible convience. Which kinda sucks, does no one have want perfection these days? Sadly not as most of the research projects I see at conferences look like they could be blown over by the wind.
		P5	My feelings: indifferent, because they are quite common.
		P6	*
		P7	OK.
		P8	Not clear enough, too general. Some people might not really understand.
		P9	Average feeling, however a bit bored to receive too many quotation text.
		P10	It received when I was watching a movie therefore I don't really bother the message after reading it. Read again later to get the message behind it, after all it was a great

			message.
		P11	Its more practical if you change “love” with “effort”.
		P12	Not sure whether I like the message or not. Some part is true but if the love that you put does not balance with the amount you do, what’s the point. Received 11.22 am.
		P13	[in Malay] it is short and simple..but further explanation is needed..mcm x dpt tangkap maksudnye..kene pikir byk kali..kenape yerk..kesimpulannye saye x paham..
		P14	Give your full focus on everything you do to make yourself enjoy it.
		P15	- Again, same point as the previous first point. - I read the message twice to understand what was it trying to say. - However, similar points as above.

Day	Message	Participant	Feedback
Seven	No duty is more urgent than that of returning THANKS.	P1	this simple sms is agreeable. Big on meaning…
		P2	A bit relieved that this was the last msg. Instead of a msg a day, 7 days a week, I'd suggest onec or twice a week only. That way I'd remember the msg better and perhaps use the advice in the msg as a 'resolution of the week'. For example, after receiving msg1 (on 11/10) my resolution of the week would be: this week I am going to do my best to finish this week's tasks by the end of the week.
		P3	-lost it
		P4	I guess this is kinda true. But a lot of duties could be said to be the more urgent, just depends on your current relationships.
		P5	Good quote, although if I were to receive this from someone I know, I would take it as a form of sarcasm.
		P6	*
		P7	Short and sweet, great impact.
		P8	This message reminds us about our responsibility. A carefully phrased message. The message was sent in the early morning (inappropriate time).
		P9	-lost it
		P10	Can't think anything after receiving it even didn't have any feedback on it.
		P11	Short and simple but too short to understand the meanings.

		P12	Don't like the message since I have no idea what it means. Probably the message is too short making it difficult to understand. Received 11.39 am.
		P13	ok...it shows that we must be thanksful...
		P14	Describe the important of appreciating something and showing how thankful you are for it.
		P15	- I was in shocked when receiving this message because I was still sleeping. So, did not actually read the message. Kind of ignore it. However, later on that day, read the message again. Still have the same impact on me as before.

*P6 – in general, he preferred these types of messages to be sent through emails, not on mobile phone.

Appendix F

Results of Personal Motivator

(Summary)

Day	Message	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
1	Happy moments, praise god. Difficult moments, seek God. Quiet moments, worship God. Painful moments, trust God. Every moment, thank God.	y	y	n	n	y	n	y	y	y	y	y	y	y	y	Y
2	Do not wait for tomorrow for what you can do today, for tomorrow is another day. Do what you can do right away.	n	y	n	y	y	n	y	y	n	y	n	y	y	y	N
3	Focus on where you want to go, not on what you fear.	y	y	y	n	y	n	n	n	n	n	n	n	y	y	Y
4	If God can turn night into day, He can turn a burden into a blessing.	n	n	n	n	y	n	y	y	y	y	y	y	y	y	N
5	Don't be afraid of making mistakes, but do be afraid of making the same mistakes.	y	n	n	n	n	n	y	y	n	n	y	y	y	y	N
6	It is not how much you do, but how much love you put in the doing.	y	n	n	n	n	n	y	n	n	y	n	n	n	y	N
7	No duty is more urgent than that of returning THANKS.	y	y	n	y	y	n	y	y	n	n	n	n	y	y	N

Appendix G

Questionnaire on Mobile Phone Use and Mobile Learning

SURVEY QUESTIONS

Instruction: for multiple choice questions, please circle the most appropriate choice, like this: ◎ .

Demographic questions

1. Which of the following categories includes your age?
   - o Under 18
   - o 18-24
   - o 25-34
   - o 35-49
   - o 50-64
   - o 65+
   - o Rather not say

2. What is your gender?
   - o Female
   - o Male

3. Select the educational level you have reached.
   - o High school
   - o Vocational/technical
   - o Bachelor degree
   - o Masters degree
   - o Professional degree
   - o PhD
   - o Other

4. What is your current employment status?
   - o Employed full-time
   - o Employed part-time
   - o Not employed
   - o Self-employed

5. If you're not employed, are you a full-time student? Yes / No (Please circle your choice)

6. What do you like to do during your leisure?
   _____
   _____
   _____

Mobile Use Questions

7. What mobile device(s) do you currently own? (You may circle more than one)
   - o Mobile phone
   - o PDA
   - o Other, please specify

     _____

8. How long have you been using your mobile device(s)?

Mobile phone	PDA	Other
o Less than 6 months	o Less than 6 months	o Less than 6 months
o 6 months – 1 year	o 6 months – 1 year	o 6 months – 1 year
o 1 – 2 years	o 1 – 2 years	o 1 – 2 years
o 2 – 3 years	o 2 – 3 years	o 2 – 3 years
o 3 – 5 years	o 3 – 5 years	o 3 – 5 years
o 5 – 7 years	o 5 – 7 years	o 5 – 7 years
o 7 – 10 years	o 7 – 10 years	o 7 – 10 years
o More than 10 years	o More than 10 years	o More than 10 years

9. How often do you use your mobile?

Mobile phone	PDA	Other
o Once a week	o Once a week	o Once a week
o A few times a week	o A few times a week	o A few times a week
o Several times a week	o Several times a week	o Several times a week
o Once a day	o Once a day	o Once a day
o Several times a day	o Several times a day	o Several times a day
o Only use it if necessary	o Only use it if necessary	o Only use it if necessary

10. Where do you use your mobile most frequently?

Mobile phone	PDA	Other
o Wherever you are	o Wherever you are	o Wherever you are
o Home	o Home	o Home
o Work	o Work	o Work
o School	o School	o School
o Library	o Library	o Library
o Travelling	o Travelling	o Travelling
o Other	o Other	o Other

11. Why do you use your mobile(s) most frequently in the place(s) stated in Q10?

_____
_____
_____
_____

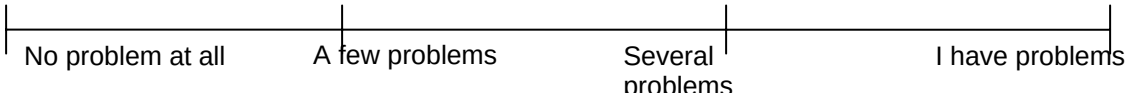
12. What is the most common activity do you always do with your mobile?

_____
_____
_____
_____

13. List activities in ascending order of how often you do them with your mobile?

_____
_____
_____
_____
_____
_____

14. How easy is it for you to perform the activities in Q11?



15. What are your problems?

_____
_____
_____
_____

16. What sort of activities would you like to do with your mobile?

_____
_____
_____
_____

17. How important is your mobile to you as a personal tool?

_____
_____
_____
_____

18. How does having a mobile affect your life?

_____
_____
_____
_____

19. What are the biggest benefits of using a mobile in your work?
_____
_____
_____
_____

20. What are the biggest problems of using a mobile in your work?
_____
_____
_____
_____

Mobile-Internet Use Questions

21. Is your mobile Internet/web enabled? Yes / No (Please circle your choice)

22. Have you ever accessed any web services on your mobile? Yes / No (Please circle your choice)

23. What kind of web services and why?
_____
_____
_____
_____

24. What kind of information do you often access or browse on these devices:

Desktops	Mobile phones	PDAs

25. Are there any differences between these browsing activities with different devices? Why?

_____
_____
_____
_____

Mobile Environment Questions

26. What **can** and **can't** you do with your mobile devices when you're in the following situations?

Situation	What I can do with my mobile	What I can't do with my mobile
Walking		
Alone		
Together with other people		
On the bus or train		
Driving a car		

27. Tell me about your mobile experience.

_____
_____
_____
_____
_____

Mobile Learning Questions

28. Do you think mobile devices can be used for learning?

_____
_____
_____
_____

29. What kind of learning is suitable in the mobile environment?

_____
_____
_____
_____

30. What kind of learning is suitable for mobile devices, i.e. PDAs, mobile phones, etc.?

Mobile phones	PDAs	Other

31. How would you feel about learning in the mobile settings?

_____
_____
_____
_____

32. How do these groups of people benefit from mobile learning?

Students	Employers	General public

33. How do the limited capabilities of mobiles (small screens, keyboards) affect learning activity?

_____
_____
_____
_____

34. How important is your mobiles to you as a learning tool?

_____
_____
_____
_____

35. Do you feel that you need better mobile technology to make m-learning more successful?

_____
_____
_____
_____

M-learning Application: Learning English Idioms

36. Where and when is a dictionary suitable for use?

_____
_____
_____
_____

What kind of interface style is most likely suitable for learning idioms in the mobile setting?

_____
_____
_____
_____

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