An investigation into the use of information and communication technology (ICT) by senior educators in Thailand

Nattavee Utakrit

Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses

Part of the Higher Education Commons

Recommended Citation

This Thesis is posted at Research Online.
https://ro.ecu.edu.au/theses/331
Edith Cowan University
Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.

- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author’s moral rights contained in Part IX of the Copyright Act 1968 (Cth).

- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
An Investigation into the Use of Information and Communication Technology (ICT) by Senior Educators in Thailand

Nuttavee Utakrit
M.S. Tech.Ed.

This thesis is presented in fulfilment of the requirements for the degree of Doctor of Information Technology

Faculty of Computing, Health and Science, Edith Cowan University,
Mount Lawley Campus

Submitted 7th June, 2006
USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.
ABSTRACT

Information and Communication Technology (ICT) may not just be for younger people or people who are still working. This study shows that it can be of importance for groups of senior people who are healthy and still have the desire to use their skills, abilities, and knowledge to assist or support our modern society. The particular groups of senior people concerned in this study were Thai senior educators above 60 from universities in Thailand living in Bangkok. The aims of this study concentrate on how they use ICT to attain their professional goals (research and teaching activities). It explores their beliefs, attitudes, the level of their needs of ICT for their professional goals and endeavours to find out what ICT is suitable. Another aim of the study is to investigate and recommend the best way of learning how to use appropriate ICT for their professional lives.

Quantitative and qualitative data were collected and provided answers to the research questions. It was carried out in two stages, first by administering a questionnaire survey of open-ended, multiple choice and Likert scale form questions and second, by in-depth interviews.

The results from this study show that Thai senior educators who are willing to keep on working believe their current skills and abilities can continue be used to support their work in their professional life and that they will benefit both themselves and society. The motivating factors that led them to continue working were convenience, professional dedication, concern for students, and personal beliefs.

The data reveals that their attitudes in using ICT to achieve their professional goals are positive and they feel ICT is a useful adjunct to support their academic activities in order to reach their professional goals. In the study, Thai senior educators wished to use ICT and to become familiar with it as it has many benefits providing them with information that can be used according to each person's need. Another factor in the study revealed that if they had their own ICT devices, such as a computer and access to the Internet to practise and use at home, it would increase their knowledge of other ICT software which they could apply to support their goals later.
There are various suitable ICT activities involving the use of a computer to carry out academic tasks, however, the most suitable are the use of the World Wide Web searching for information on websites, using a search engine to obtain information and to obtain direction on using ICT to search. Other activities that take advantage of using a computer are the word processing of tests, handouts and other materials and presenting lessons.

Many devices and software assist educators in their academic activities, however, not every type is suitable because it may be thought some are too hard to use and there may not be much chance to use them. The study found that a cell phone was considered one of the most appropriate ICT devices, as were a desktop computer, a printer, and a scanner. Three software packages considered as the most suitable by these groups of people are a Word processor, Software presentations and Spreadsheets respectively.

Finally, it was obvious from the study that the most appropriate way of learning ICT would be by employing mixed methods by integrating learning in small groups with an educational environment, providing opportunities to confer with persons who can answer questions in the use of ICT and by offering opportunities to practice by themselves with media specially designed for these groups of people.
DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education.

(ii) contain any material previously published or written by another person except where due reference is made in the text; or

(iii) contain any defamatory material.

I also grant permission for the Library at Edith Cowan University to make duplicate copies of my thesis as required.

Signature: ...

Date: ....12th October, 2006
ACKNOWLEDGEMENTS

There are many people who in different ways have contributed to the success of this thesis and I would like to thank all of them. However, my special thanks go to my Principle Supervisor, Dr. Jan Ring for her patient and continued guidance and encouragement throughout the period of my study. Even though I began this research in her last semester at ECU before her retirement, she kindly gave constant advice, assistance and support from the beginning to the end. This was invaluable in keeping me writing. Thank you very much and please accept my deep gratitude and appreciation.

Many thanks go to my Associate Supervisor, Dr. Chuiyaporn Chirathamjaree who also made valuable comments on my thesis. Thank you also to Dr Jeremy Pagrum and Dr. Barnard Clarkson who read and made valuable suggestions regarding my thesis proposal. Furthermore, thank you Professor Tony Watson and Associate Professor Dr. Jim Cross for offering me a place to study in the University who also advised me when I began. Thanks are also due to Associate Professor Dr Peng Lain, the DIT course coordinator, for her kind advice throughout my study.

I would like to extend my thanks to my ECU friends and other friends, both in Australia and in Thailand, who have always supported and encouraged me in different ways. Thank you to all my research participants who have given me very good feedback and provided valuable data to enable me complete my thesis.

Finally, my heartfelt appreciation goes to my parents and my younger sister to Associate Professor Dr. Sobsan, Assistant Professor Dr Pranom, and Ms. Nattukant Utnkrit, who have supported and encouraged me during my doctoral studies. Last but not least, thanks you to Sarinya Raweetrip, a very special person, who has stood by me and encouraged me on my long academic journey which has culminated in the completion of my thesis.
# TABLE OF CONTENTS

**USE OF THESIS**

**ABSTRACT**

**DECLARATION**

ACKNOWLEDGEMENTS

<table>
<thead>
<tr>
<th>CHAPTER 1 INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The background of the study</td>
<td>1</td>
</tr>
<tr>
<td>1.2 The significance of the study</td>
<td>2</td>
</tr>
<tr>
<td>1.3 The purpose of the study</td>
<td>3</td>
</tr>
<tr>
<td>1.4 Research questions</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 2 LITERATURE REVIEW</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Introduction</td>
<td>5</td>
</tr>
<tr>
<td>2.2 Defining ICT (Information and Communications Technology)</td>
<td>5</td>
</tr>
<tr>
<td>2.3 Older people's use of ICT</td>
<td>7</td>
</tr>
<tr>
<td>2.4 The benefits of ICT for older people</td>
<td>9</td>
</tr>
<tr>
<td>2.5 ICT in Education</td>
<td>11</td>
</tr>
<tr>
<td>2.6 An overview of Thailand</td>
<td>15</td>
</tr>
<tr>
<td>2.7 ICT in Thailand</td>
<td>15</td>
</tr>
<tr>
<td>2.8 ICT in education in Thailand</td>
<td>18</td>
</tr>
<tr>
<td>2.9 Theories related to the study</td>
<td>20</td>
</tr>
<tr>
<td>2.10 Similar study</td>
<td>24</td>
</tr>
<tr>
<td>2.11 Summary</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 3 RESEARCH METHODOLOGY</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Introduction</td>
<td>26</td>
</tr>
<tr>
<td>3.2 Research methodology</td>
<td>26</td>
</tr>
<tr>
<td>3.3 Quantitative research</td>
<td>27</td>
</tr>
<tr>
<td>3.4 Qualitative research</td>
<td>27</td>
</tr>
<tr>
<td>3.5 Mixed methods</td>
<td>28</td>
</tr>
<tr>
<td>3.6 Case study research</td>
<td>29</td>
</tr>
<tr>
<td>3.7 Data collection</td>
<td>30</td>
</tr>
<tr>
<td>3.8 Data analysis</td>
<td>32</td>
</tr>
<tr>
<td>3.9 Sample</td>
<td>32</td>
</tr>
<tr>
<td>3.10 Language, translation and transcription</td>
<td>33</td>
</tr>
<tr>
<td>3.11 Reliability and validity</td>
<td>33</td>
</tr>
<tr>
<td>3.12 Ethical considerations</td>
<td>34</td>
</tr>
<tr>
<td>3.13 Conceptual framework</td>
<td>35</td>
</tr>
<tr>
<td>3.14 Conclusions</td>
<td>38</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 2.1: ICT devices in education
Table 2.2: Software tools in education
Table 2.3: Internet adoption in South-East Asia (2003)
Table 2.4: Internet user profile of Thailand 2003 classified by careers
Table 2.5: The difference between pedagogy and andragogy as learners
Table 4.1: Gender of the participants
Table 4.2: Ages of participants
Table 4.3: Lust or current educational position of participants
Table 4.4: Current skills and abilities of senior educators to support their professional life
Table 4.5: Keeping working to support their professional life
Table 4.6: How long do senior educators want to continue working
Table 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities
Table 4.8: Activities that senior educators intend to do in the future
Table 4.9: Correlation of two variables
Table 4.9a: Correlation matrix of the current activities of the participants and the activities they intend to do in the future
Table 4.9b: Brief of interview respondents' backgrounds
Table 4.10: How much senior educators agree or disagree with "Computers and the Internet now play great roles in education"
Table 4.11: How much senior educators agree or disagree with "ICT is only suitable for younger people"
Table 4.12: How much senior educators agree or disagree with "Everybody should know how to use a computer and the Internet"
Table 4.13: How much senior educators agree or disagree with "Educators should know how to use computers and the Internet"
Table 4.14: How much senior educators agree or disagree with "Using ICT helps me to gain more skills, experience, and better performance in my professional goals"
Table 4.15: How much senior educators agree or disagree with "ICT provides more advantages for my professional life than disadvantages"
Table 4.16: How much senior educators agree or disagree with
"I am quite familiar with using ICT in my professional life"

Table 4.17: How much senior educators agree or disagree with "ICT is not hard to use if I have a good advisor to guide me"

Table 4.18: How much senior educators agree or disagree with "I should not fear using ICT"

Table 4.19: How much senior educators agree or disagree with "The computer and the Internet are important in supporting my academic goals"

Table 4.19a Correlation of two variables

Table 4.20: How much do they [Thai senior educator] believe that ICT assists in the accomplishment of their professional goals

Table 4.20: How much do they [Thai senior educator] believe that ICT assists in the accomplishment of their professional goals

Table 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals

Table 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals

Table 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals

Table 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals

Table 4.25: How much do you believe using ICT can help you to achieve your professional goals

Table 4.26: How if they have an opportunity to use ICT would they like to try their facilities

Table 4.27: Do you believe that ICT benefits current educational societies

Table 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life

Table 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals

Table 4.30: The level of senior educators’ desire to use ICT to help achieve their professional goals
Table 4.30a Correlation of two variables
Table 4.31: The level of senior educators' needs of a computer at home
Table 4.32: The level of senior educators' needs to access the Internet from home
Table 4.33: The level of senior educators' needs to keep their work and paper documents in their Hard disk or CD Rom
Table 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils
Table 4.35: The level of senior educators' needs to prepare lessons by PowerPoint
Table 4.36: The level of senior educators' needs of ICT to support them to achieve their academic goals
Table 4.37: A comparison of task activities of senior educators in supporting their professional goals
Table 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals
Table 4.38a Correlation matrix of Thai senior educators' beliefs in how a particular type of ICT can assist in the accomplishment of their professional goals and how much they use ICT
Table 4.39: The percentages of scenario methods that were selected by the respondents
LIST OF FIGURES

Figure 2.1: Geographical location of Thai Internet users 16
Figure 2.2: Thai Internet users by age 19
Figure 2.3: Percentage of employment of Thai Internet users 20
Figure 3.1: Conceptual Framework 35
Figure 4.1: Percentages of the gender of participants 40
Figure 4.2: Percentages of the ages of participants 41
Figure 4.3: Percentage of the last or current educational position of participants 42
Figure 4.4: Current skills and abilities of senior educators to support their professional life 44
Figure 4.5: Keeping working to support their professional life 45
Figure 4.6: How long do senior educators want to continue working 46
Figure 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities 47
Figure 4.8: Activities that senior educators intend to do in the future 48
Figure 4.9: A comparison between current activities of senior educators and the future activities they intend to do 49
Figure 4.10: How much senior educators agree or disagree with “Computers and the Internet now play great roles in education” 60
Figure 4.11: How much senior educators agree or disagree with “ICT is only suitable for younger people” 61
Figure 4.12: How much senior educators agree or disagree with “Everybody should know how to use a computer and the Internet” 62
Figure 4.13: How much senior educators agree or disagree with “Educators should know how to use computers and the Internet” 63
Figure 4.14: How much senior educators agree or disagree with “Using ICT helps me to gain more skills, experience, and better performance in my professional goals” 64
Figure 4.15: How much senior educators agree or disagree with “ICT provides more advantages for my professional life than disadvantages” 65
Figure 4.16: How much senior educators agree or disagree with “I am quite familiar with using ICT in my professional life” 66
Figure 4.17: How much senior educators agree or disagree with “ICT is not hard to use if I have a good advisor to guide me” 67
Figure 4.18: How much senior educators agree or disagree with “I should not fear using ICT” 68
Figure 4.19: How much senior educators agree or disagree with “The computer and the Internet are important in supporting my academic goals” 69
Figure 4.20: How much do they (Thai senior educator) believe that ICT assists in the accomplishment of their professional goals 73
Figure 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals 74
Figure 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals 76
Figure 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals 78
Figure 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals 81
Figure 4.25: How much do you believe using ICT can help you to achieve your professional goals 82
Figure 4.26: How if they have an opportunity to use ICT would they like to try their facilities 83
Figure 4.27: Do you believe that ICT benefits current educational societies 84
Figure 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life 86
Figure 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals 87
Figure 4.30: The level of senior educators’ desire to use ICT to help achieve their professional goals 88
Figure 4.31: The level of senior educators’ needs of a computer at home 90
Figure 4.32: The level of senior educators’ needs to access the Internet from home 91
Figure 4.33: The level of senior educators’ needs to keep their work and paper documents in their Hard disk or CD Rom 92
Figure 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

Figure 4.35: The level of senior educators' needs to prepare lessons by PowerPoint

Figure 4.36: The level of senior educators' needs ICT to support them to achieve their academic goals

Figure 4.37: A comparison of task activities of senior educators in supporting their professional goals

Figure 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals

Figure 4.39: The percentages of scenario methods that were selected by the respondents
CHAPTER I
INTRODUCTION

1.1 The background of the study

Thailand is classified as a developing country (Nasingkun, 2003) and its government has successfully implemented ministerial regulations to support and encourage people to adopt ICT (Thuvasethakul, 2002). However, senior citizens in Thailand are still reluctant to use the new technology because they are unfamiliar with it. Unlike the new generation, they worked and lived in a period when this new technology was still in the development stage. They have grown old yet many of them are using their skills and ability to continue working as usual. For instance, they work as assistants in companies, as supplementary lecturers, and some are invited to be speakers at seminars or conferences in their specialized fields.

The structure of Thai society is a hierarchical one where older individuals enjoy more status and seniority than younger ones and thus many senior citizens may find their skills more sought after than in a Western society. Naturally, people in this group are usually not familiar with the new technology, some however, are in day-to-day contact with ICT in their jobs. For example, there are educators in universities, people
who have knowledge, ability and experience that they would like to use to support society.

However, because of their age and the fact that they feel out-of-date, for they retired before the new technology came in, it may be hard for them to learn how to use ICT by themselves. Given that ICT can make an ordinary teacher's life easier and support his/her work (Alward, 2004), how can Thai senior educators catch up with the new technology? Do they really need to learn ICT at their age or not? How much ICT do they in fact require?

In addition, ways which work for younger people to use or become familiar with the new technology will not necessarily be successful with older people (Bean, 2001). Therefore, another important issue that needs consideration is what is the best way for them to learn and how can they utilise it in their work?

From the pragmatic reasons stated above, ICT is not just for the new generation or people who are still working, it may also be beneficial for other groups of people to help them participate in and contribute to modern society. This study focuses on end-users aged 60 and above in Bangkok, Thailand and their utilization of Information and Communication Technology. The phrase "Thai senior people" means people over 60, as 60 is the official age for retirement of Thai public servants (in-society.go.th, 2004). A study will be made of selected Thai senior university educators living in Bangkok as far as possible.

I.2 The significance of the study

Senior university educators in Thailand who are healthy are still important human resources for organisations and society (Rujikea, 2003). These people can contribute actively to society even though they have retired. According to the Thai Government's policy, these people are still needed to teach and conduct research in their respective fields (Khaosod, 2002) and at the same time, the Government also encourages Thai people to get used to ICT. This research has therefore been undertaken to support and be in line with these policies.
It will investigate a selective study of senior educators in Bangkok, the capital city of Thailand and its surroundings. It will specifically explore and analyse their use of ICT (Information and Communication Technology). For instance, what specific Technology they need, which are suitable for this group, how can they utilise them and how can they best learn new IT skills? The results of the research will help both researchers and senior Thai educators to understand what ICT topics can enable them to reach their goals. It will also assist course developers to design and conduct appropriate ICT training that will assist senior academics. Once they are familiar with ICT, they will become confident in applying their new knowledge in their work. This will be of significance to them and moreover help them not to feel out-of-date and permit them to have an easier life in modern society.

Another significant outcome of this research is that it may also be of international importance to groups of senior people in both developing and developed countries where there are similar environments and factors.

1.3 The purpose of the study

This research will concentrate on how senior Thai educators use ICT to attain their professional goals (research activities, teaching activities). The purpose of this research is:

1. To explore their beliefs in using ICT for their professional goals.
2. To explore their attitudes in using ICT to achieve their professional goals.
3. To explore the level of their needs of ICT in their academic life.
4. To explore what ICT is suitable to support their professional goals.
5. To investigate and recommend the best way of learning how to use appropriate ICT in their lives.
1.4 Research questions

This thesis aims to investigate the use of ICT by senior educators in Thailand. The major research questions will be divided into two areas; first, their professional goals (research activities, teaching activities) and second, the best way for them to learn ICT.

The first major questions concern their professional goals:

1. What are their professional goals?
2. What are their attitudes about using ICT to achieve them?
3. How much do they believe ICT can help?
4. What level of ICT do they need?
5. How can ICT help them to be successful?
6. What appropriate ICT do they need to succeed?

The second major question is:

What do they believe will be the best way for them to learn ICT?

Chapter 2 reviews the body of literature relating to the thesis. Chapter 3 describes the methodology used and includes the following sections: Research methodology, mixed methods (quantitative research and qualitative research), case study, data collection (Questionnaire surveys, In-depth Interviews), data analysis, sample group, language translation and transcription, reliability and validity, ethical considerations, scope and limitations of the study, and conceptual framework. Chapter 4 presents the analysis of the results; quantitative data, the questionnaire survey and the qualitative data, open-ended questions and in-depth interviews in order to answer research questions. Chapter 5 discusses the results and the final section, conclusions, consists of a summary of the study and its findings and ends with recommendations for further study.
CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This literature review aims at providing an insight into the concepts of this thesis through retrospective analysis of the relevant issues in the field and a similar study. The review includes:

- Defining ICT
- Older peoples' use of ICT
- The benefits of ICT for older people
- ICT in education
- An overview in Thailand
- ICT in Thailand
- ICT in education in Thailand
- ICT and senior in Thailand
- Theories related to the study
- A similar study
- Summary

2.2 Defining ICT (Information and Communications Technology)

The acronym ICT stands for Information and Communication Technology and today it is being used especially in the fields of business, education, and in organizations. ICT has a synonym, IT (Information Technology) which preceded it. IT and ICT are defined as follows:

IT is a common term for the entire spectrum of technologies for information processing including software, hardware, communications technologies and related services. (Carter, 2004, p. 210)
IT includes technologies used to create, store, and exchange information in formats that include computer data, telephony, instant messaging, graphics, and video. (Parsen & Oja, 2005, p. 40)

What is ICT?

ICT has a similar meaning to IT; however, it covers all elemental technology and the ways people use it to communicate at present. Authors have quoted its meaning has been defined as follows:

ICT is a categorical term sometimes used (particularly in Europe) to refer to the combined fields of computing and communications. Commonly, Information Technology (IT) is used in this sense, since the latter term, by definition, includes both types of Technology. (Ganther, 2004, p. 189)

A diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. (Tinio, 2003, p. 4)

ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email, robots. ICT is, therefore, concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is also concerned with the way these different uses can work with each other (Tutor2U.net, 2004)

As can be seen from these definitions of ICT and IT, they are similar in meaning and concept because both concern computers, software, the Internet and the processing of communication information using new technologies. However, the term Information and Communication Technology (ICT), which has recently replaced IT, is more appropriate in this research. According to the National Curriculum documents for the UK (2000), ICT is an adopted word from IT and it shows the importance of, rather than use of “IT” (AuditmylC.com, 2004). In addition, the letter “C” in the middle of IT (Information Technology) emphasizes that it is not just for computer technicians, but also relevant to anybody whose work or life involves communication and technology (flexibility.co.uk, 2000). The acronym ICT, therefore, in the context of this thesis will be used instead of IT.
2.3 Older peoples' use of ICT

Older people are interested in using ICT in everyday life because it can assist in their work, can be fun to use and because they are curious about this new innovation. The demand for the use of new technologies, computers and the Internet, has increased in many countries, however, as described below, the literature suggests that the number of aged people who have access to ICT is still limited compared to members of the younger generation.

"Computers are enhancing the lives of older people", according to a report concerning older people and the new technology by Irizarry & Downing (1997, p.161). The findings in this particular report noted that older people acknowledged the benefits of the new technology after they had completed a training course.

A survey by Age Concern and Barclays (Ageconcern.org.uk, 2002), shows that two-thirds of IT users above 55 agree that the Internet has had a positive impact on their lives.

In China, older people are eager to learn and catch up with new technological knowledge and about 70% of people in this age group like to log on to the Internet (China.org.cn, 2001).

According to an adult and teen survey in the U.S.A., the proportion of older people (over 55) in Michigan using the Internet is close to half the proportion of the teenage population teenagers, 44% and 88% of the respective age groups. Nevertheless 67% of adults are eager to learn and use new technologies, while 12% felt they are too complicated, only 14% disliked them and 7% did not know (Williams, 1999).

Growth in the use of the Internet by people over 55 in Australia is faster than in the past. The same fact was reported from the United States and Canada on this particular issue (Merkcs, 2000).

However, older people use ICT less than people in other age groups and much less than younger people. A report from the Department for Education and Employment (RSGB), Great Britain, (Russell & Drew, 2001) showed only 14% of Internet users
were 55 and above while the main group of users are those between the ages 16-34 (70%). Nevertheless, the report stated among current non-users, there are some who are interested in using computers or the Internet but have been prevented from doing so:

A paper by Hecston (2002) however, shows older people in Ireland like to access information from printed media (80%) such as newspapers, newsletters, booklets and leaflets but 13% had used the Internet to access information. This suggests that computer access among older people in Ireland is now on the increase. The report, however, shows that several major barriers that obstruct older peoples' use of the ICT are as follows:

- The performance of sensory organs of the body that comes with age are poorer vision or lack of manual dexterity
- The cost of the equipment to use ICT is expensive
- Lack of confidence
- Lack of education or training
- Fear of embarrassment in a training or tutorial setting
- Inability to obtain transport to use computer facilities.

In addition, outdated equipment and inappropriate training methods are potential obstruction factors for older people to access ICT (Merkes, 2000).

In some countries, for instance, the United Kingdom and the United States, older people are encouraged to use ICT, however, so far only a few studies have examined in detail older adults' access to ICT (Selwyn, Gorard, Furlong, & Madden, 2003). The report, “The older generation and the European information societies: access to the Information societies” mentions “more research needs to be carried out on the needs of older people and the benefits of ICT for this age group” (Campbell, 2002).

The above reviews show older people tend to be positive about the utilization of ICT, however, in developing countries, only a few older people enjoy the benefits compared to younger people and to date, few studies have been conducted on older people as regards this particular issue. This research will study this particular age group and endeavor to answer the research questions.
2.4 The benefits of ICT for older people

ICT influences many people in today’s society. People are confronted with the use of ICT from morning until bedtime. Mobile phones, the radio and television, are common types of ICT that people use regularly in daily life. However, the e-service or e-government provided by governments is an important new example of using ICT support for everyday life. Governments distribute useful information for people via the Internet on topics such as payment of tax, emigration, sickness benefits administration, electronic services to families, geographical data sharing, hospital-nursing home cooperation, immigration cases, occupational accident administration, car registration, agricultural regulation, and welfare benefits administration (c.gov.dk, 2004).

According to Kirkwood (2001) in a study of “older people and the Internet”:

IT can transform the lives of older people, providing contacts, information, entertainment and access to specialised services. It can enable radical new models of health care and support for older people living at home, effecting savings that would amply repay the costs of installing an internet connection in every house, just like electricity, gas and water. But it requires profound changes in attitude - a belief in, and a belief by, older people that they can cope. (p. 1)

Moreover, using ICT can help senior people not feel so isolated as suggested by Lewin (2001):

Although not a cure-all, learning to use a computer may help to compensate for some of the problems and conditions which commonly accompany older age (p. 5)

This means ICT is of significance to them as it is not just for people in particular fields, but can provide both older people and younger people with similar benefits. Campbell (2002) indicate conclusively the benefits of ICT to older people as follows:

- Communication: e-mail and chatting programs allow people to communicate and provide a means of exchanging or transferring data during a discussion. This is a particular advantage for older people who are not able or are less able to communicate in real life.
- Information resource: using the Internet everyone can gain more information in a short time, information on health, pensions, social security, employment, retirement, housing, insurance and travel.
• Employment: using ICT increases the opportunity for obtaining many jobs. Older people who are familiar with ICT will improve their employment options. ICT makes it possible for new and flexible modes of work, for instance, teleworking.

• Electronic commerce: teleshopping and telebanking are services which are useful for older people especially for those who have transportation limitations.

• Independent living: ICT can help support older people to live healthily and independently at home by using telemedicine, treatment, and electronic commerce.

• Intergenerational relationships: access to ICT can improve older people's contact with their grandchildren and younger people generally.

• Distance learning: this can be valuable for older people who might otherwise be excluded from the traditional educational system. Learning with or about ICT helps to maintain mental skills and health.

• Cost reduction: older people can use ICT to reduce the cost of delivery services.

• Strengthening the community: ICT can be successful in developing local communities, from which older people will benefit.

The above factors emphasize the benefits of ICT for older people in general and show how important it can be. This study will focus in-depth on Thai senior educators' use and the associated benefits of using ICT, a subject on which no research has so far been done. In attempting to answer the research questions it will be necessary to consider the above mentioned areas.
2.5 ICT in Education

"Where the appropriate systems of support are in place, then the ICT can be experienced as a transformative technology both for staff and for students" (Comber & Lawson, 1999, p. 5).

In the past, teachers stood in front of class with a chalkboard during the allotted class time and occasionally asked the class questions. Overhead transparencies were later used to help as teaching aids (Liebman, 2004). However, new technology helps teachers and enables them to teach in different ways and it also enables students to transfer their knowledge to others (Davivongse, 2004).

The use of ICT challenges the education system (Jensen, 2003) as it includes all the components of new information technology in the delivery of educational materials (Roberson, 2000). ICT involves using multimedia technologies, for instance, audiovisual aids that are good tools to enhance the teaching and learning process (ITEA, 2004). They have become commonplace in peoples' working and learning lives (Duggleby, Jennings, Pickering, & Schmoller, 2004).

Brown (2005) has also described the benefits of ICT for educators in their workforce as below:

- ICT offers educators new ways of teaching the same things
- ICT enables a focus on each and every learner style
- ICT is a tool in the annoury for tackling barriers to engagement
- ICT helps educators reduce bureaucratic burdens
- ICT saves time in lesson planning and administration
- ICT offers a more comprehensive approach to assessment

While ICT is challenging and becoming part of educational societies, today many types of ICT assist are being used and may be classified into two types: ICT devices and Software tools.
## ICT devices in education

<table>
<thead>
<tr>
<th>Type</th>
<th>Benefits</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>Support teaching in various ways such as:</td>
<td>Desktop, Laptop</td>
</tr>
<tr>
<td></td>
<td>• prepare or present lessons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• communicate with students, administrators, colleagues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• search for information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• generate or keep record data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• entertain users: researchers, lecturers, or students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• facilitate project based learning</td>
<td></td>
</tr>
<tr>
<td>Hand-Held ICT devices</td>
<td>Support indoor and outdoor activities for educational needs, such as:</td>
<td>PDA (Personal Digital Assistant),</td>
</tr>
<tr>
<td></td>
<td>• provide functions and the capacity close to desktops and laptops</td>
<td>Digital camera, and Mobile phone</td>
</tr>
<tr>
<td></td>
<td>• portable devices for education activities everywhere</td>
<td></td>
</tr>
<tr>
<td>Other ICT devices</td>
<td>Support educational activities in various tasks depending on the type or</td>
<td>Video, DVD player, projector,</td>
</tr>
<tr>
<td></td>
<td>the way they are used, such as:</td>
<td>CD, DVD-ROM drive, small data</td>
</tr>
<tr>
<td></td>
<td>• preparing, creating teaching aids</td>
<td>storage unit (USB drive, or thumb</td>
</tr>
<tr>
<td></td>
<td>• recording or transferring movies, photos, or sound</td>
<td>drive), Web camera</td>
</tr>
<tr>
<td></td>
<td>• storing data</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: ICT devices in education

Source: * = (Geisert & Futrell, 2000),
** = (Shelly, Cashman, & Vermaat, 2006)
## Software tools in education

<table>
<thead>
<tr>
<th>Type</th>
<th>Benefits</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Word Processor</td>
<td>Support educators to: *</td>
<td>Microsoft Word, WordStar,</td>
</tr>
<tr>
<td></td>
<td>• prepare instructional materials, individualized worksheets, reports</td>
<td>WordPerfect, MacWrite, Magic</td>
</tr>
<tr>
<td></td>
<td>• keep records (e.g. classroom records, school projects, or inventories)</td>
<td>Slate</td>
</tr>
<tr>
<td></td>
<td>• save student information in electronic files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• print out announcements, letters, reports, or worksheets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• check errors of spelling or grammar in the worksheets or reports by</td>
<td></td>
</tr>
<tr>
<td></td>
<td>using a spell checker</td>
<td></td>
</tr>
<tr>
<td>Spreadsheet software</td>
<td>Support educators to: *</td>
<td>Microsoft Excel</td>
</tr>
<tr>
<td></td>
<td>• organize data in tables and perform calculations on the data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Creating charts and graphs</td>
<td></td>
</tr>
<tr>
<td>Software presentation /</td>
<td>Support educators to: **</td>
<td>Microsoft PowerPoint,</td>
</tr>
<tr>
<td>Multimedia software</td>
<td>• improve presentations by using graphics, animation, or sound</td>
<td>Macromedia Director, and</td>
</tr>
<tr>
<td></td>
<td>• create teaching aids such as CAI</td>
<td>Macromedia Authorware</td>
</tr>
<tr>
<td>Graphics tools</td>
<td>Support educators to: **</td>
<td>Adobe Photoshop, Adobe</td>
</tr>
<tr>
<td></td>
<td>• create graphics for a variety of uses</td>
<td>Illustrator, CorelDraw,</td>
</tr>
<tr>
<td></td>
<td>• alter graphics from other source such as scanned images, pictures from</td>
<td>and PC Paint</td>
</tr>
<tr>
<td></td>
<td>the World Wide Web, clip art, photos from digital cameras, or previously</td>
<td></td>
</tr>
<tr>
<td></td>
<td>created graphics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• convert graphic formats so that they can be used with other software</td>
<td></td>
</tr>
<tr>
<td></td>
<td>programs, or other types of computer formats such as Windows and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Macintosh</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Benefits</td>
<td>Examples</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The Internet</td>
<td>Offers teachers and learners many opportunities to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• increase knowledge from the resources on the Internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• access a wide range of resources available at any time and place, allowing teachers and learners to maximize their teaching and learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• meet and have synchronous communication via chatting or asynchronous contact through e-mail or a forum</td>
<td></td>
</tr>
<tr>
<td>World Wide Web</td>
<td>Allows educators to access and view information on Web pages by using an application software called a Web browser. The information contains text, graphics, audio, video, and connection to other documents.</td>
<td></td>
</tr>
<tr>
<td>CAI (Computer Aided Instruction)</td>
<td>Makes the learning process more efficient because it:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• saves time and the cost of course instructors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• It is individualized and convenient for students to set up their own schedules and flexible because it can be moved to other places.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Software for CAI can track course progression, test scores, and be updated.</td>
<td></td>
</tr>
<tr>
<td>Search engines</td>
<td>Allow educators to find specific documents and information on the Internet through keyword search and menu choices.</td>
<td>Yahoo, Google, Lycos, AltaVista</td>
</tr>
<tr>
<td>Email</td>
<td>Allows educators to transfer messages, photos, electronic documents, audio and video clips and electronic files via a computer network.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2. Software tools in education

Source: * = (Geisert & Futrell, 2000), ** = (Forcier & Dese, 2005), *** = (Brusilovsky, 2001), **** = (Shelly et al., 2006)
2.6 An overview of Thailand

Thailand, classified as a developing country (Nasingkun, 2003) is located in Southeast Asia covering an area of 513,115 square kilometers, equivalent to the size of France (start.gov, 2004). It is divided into four natural regions: North, Northeastern, Central and Southern. It has 76 provinces and its capital, Bangkok, is located in the central part (Thuvasethakul & Kasititorn, 2003).

The U.S Department of State (start.gov, 2004) reports that in 2003, Thailand's population reached 64.2 million about 9.6 million of which are in Bangkok. The age structure between 0-14 years is 24.2%, 15-64 years is 68.8%, and 65 years and over is 7% respectively (theodora.com, 2004).

2.7 ICT in Thailand

<table>
<thead>
<tr>
<th>Country</th>
<th>Internet adoption in South-East Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High adoption rate</td>
</tr>
<tr>
<td>Singapore</td>
<td>51.48%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>25.15%</td>
</tr>
<tr>
<td>Thailand</td>
<td>9.5 and 11%</td>
</tr>
<tr>
<td>Brunei</td>
<td>9.97%</td>
</tr>
<tr>
<td>Philippines</td>
<td>7.77%</td>
</tr>
<tr>
<td>Low and very low adoption rate</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.93%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.49%</td>
</tr>
<tr>
<td>Laos</td>
<td>0.17%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.08%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

Table 2.3: Internet adoption in South-East Asia by Nua Internet Surveys (2003)
Source: (Poonsri, 2003)
After the World Bank had explored and evaluated knowledge and information systems in Thailand, it found Thailand's use of ICT (Information and Communication Technology) is still low (Koanantakool, 2003). Table 2.3 shows the percentage of Internet adoption in Thailand compared with other South-East Asian countries in 2003 (Poonsri, 2003) from which it can be seen that the Internet adoption rate of Thailand is between 9.5 to 11%. Thailand is given a medium rating in comparison with other countries in South-East Asia (Poonsri, 2003). It is higher than countries such as Indonesia, Vietnam, Laos, Cambodia, Myanmar but still low compared to Singapore and Malaysia.

However, according to the Asia Marketing Research publication “Internet Usage, Population Statistics and Information” (InternetWorldStats.com, 2003), the growth of ICT users in Thailand has increased from around 2.3 million to over 3.5 million users, over 50 percent within the last two years. The use of ICT in Thailand centres around Bangkok, and its surroundings, where the ICT facilities are better than in other areas. The pie chart below shows the percentage of Internet users in different parts of Thailand. It can be seen that 54.3% of Thai Internet users are living in Bangkok, 25.8% are in the vicinity, and 18.1% and 1.8% respectively are living in rural areas and abroad.

![Geographical location of Thai Internet users](image_url)

**Figure 2.1: Geographical location of Thai Internet users**

Source: (NECTEC & NSTDA, 2004)
Table 2 below classifies the percentages of Thai Internet users by career. The biggest percentages come from IT, education and research, (15.4%, 14.2%) respectively, however, this does not include other careers (15.2%).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>15.4</td>
</tr>
<tr>
<td>Education, Research</td>
<td>14.2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>6.9</td>
</tr>
<tr>
<td>Healthcare</td>
<td>6.3</td>
</tr>
<tr>
<td>Banking, Finance</td>
<td>5.1</td>
</tr>
<tr>
<td>Mass Communication, Advertising</td>
<td>4.6</td>
</tr>
<tr>
<td>Electricity, Telephone, Waterworks</td>
<td>3.9</td>
</tr>
<tr>
<td>Retail</td>
<td>3.7</td>
</tr>
<tr>
<td>Import, Export</td>
<td>3</td>
</tr>
<tr>
<td>Tourism, Hotel, Restaurant</td>
<td>3</td>
</tr>
<tr>
<td>Construction, Real Estate</td>
<td>2.9</td>
</tr>
<tr>
<td>Law</td>
<td>2.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2.7</td>
</tr>
<tr>
<td>Transportation, Warehousing</td>
<td>2.5</td>
</tr>
<tr>
<td>Wholesale</td>
<td>2.1</td>
</tr>
<tr>
<td>Entertainment, Art</td>
<td>1.8</td>
</tr>
<tr>
<td>Military</td>
<td>1.6</td>
</tr>
<tr>
<td>Government Policy Making</td>
<td>1.2</td>
</tr>
<tr>
<td>Business Consulting</td>
<td>1.1</td>
</tr>
<tr>
<td>Other careers</td>
<td>15.2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2.4: Internet user profile of Thailand 2003 classified by career
Source: (NECTEC & NSTDA, 2004)

The Thai Government and business organisations have cooperated and invested in enhancing ICT in Thailand recognising it as a potential issue for Thai social and economic development. Many policies and plans from the Government have been put forward from time to time, for instance, the IT 2000, IT 2010 policies which are to encourage, develop and lead Thailand to a Knowledge-based Economy (Koanantakool, 2003). According to the Thai Minister of Information and Communication Technology, Mr.Sunpong Suebwonglee, quoted from Thailand board of Investment (2003) the present Prime Minister of Thailand is committed to developing Thailand into a "knowledge-based society".
Moreover, the SE strategy, e-Government, e-Commerce, e-Industry, e-Education, and e-Society, have been included in Thailand's national information technology master plans (IT2010) in order to reach the Thai people and support their adoption and use of ICT (ICT_Expo2005, 2004). To date, the Government has launched several projects to help Thai people become aware of the use of ICT for example the “ICT Computers for Thais project” providing low-cost computers to low and middle-income families, students, and civil servants (Thairath.co.th, 2004), and “The SchoolNet”, a national school informatization program to empower all schools to access a large pool of information using the Internet (School.net.th, 2004).

Three other examples the “Thai ruralNet”, “Community Telecenter” and “the Government Information Network” (GINet) are all government backed networks to facilitate intra- and inter-agency communication and information exchanges (Thuvaseithakul & Koanantakool, 2002).

This background information on Thailand is important because it reveals the position of ICT in the country, indicates the trend that ICT users of the Internet are increasing annually, and that the Thai Government is enhancing ICT use by encouraging the Thai people to utilise its facilities by launching projects and policies to support it. However, as the majority of ICT facilities are located in the Bangkok area, the largest number of people using the Internet lives there.

2.8 ICT in education in Thailand

According to Tinio (2003):

For developing countries, ICT has the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalizing strategy for developing countries (p. 6).

Thailand is a member of the ASEAN group of countries and is classified as a developing country (Nasingkun, 2003). The Thai Government, wishing to encourage Thai people to use ICT, has launched the National ICT Plan specifically for education and provided both teachers and student with ICT resources, such as computers, support teachers and student learning. In addition, the Government is also encouraging Thai
teachers to become more familiar with ICT. To date, about 21% of all teachers have been trained in a variety of ICT programs to support their work depending on their needs. The ICT programs that are most requested and for which most teachers have been trained are Microsoft Office, Visual Basic, HTML, SQL, and CAI (Belawati, 2003). The Government is also planning to have at least 300,000 teachers who can use ICT by 2006, 70% of whom are located outside Bangkok and it is envisaged that at least 90% of new graduates from formal educational programs will be able to use ICT (Thuvasthakul & Kasititorn, 2003). In addition the Government has also initiated ICT projects for educational activities. For example, the project “SchoolNet Thailand” a national school “informatization action program” which linked about 5,000 schools online through their websites (Tubtimhim, 2001).

2.9 ICT and senior people in Thailand

The use of ICT among seniors in Thailand is still low. According to the bar graph (Figure 2.2), Internet usage by these over 60s is only a tiny fraction of the total, just 0.2%.

![Thai Internet users by Age (2004)](image)

**Figure 2.2: Thai Internet users by age (2004)**  
**Source:** (NECTEC & NSTDA, 2004)

A study conducted by Sungsri (1999) about the basic information needs of Thai senior citizens between 55-70 showed that although many still wished to obtain education, knowledge and information, the methods of disseminating and obtaining
knowledge and information they used most were not computers or the Internet, but television broadcasting, radio, newspapers, knowledgeable persons and textbooks. ICT is still not popular for this group of people.

![Employment of Thai Internet users](image)

**Figure 2.3: Percentage of employment of Thai Internet users (2003)**
Source: (NECTEC & NSTDA, 2004)

Moreover, Figure 2.3 shows that the retired only account for a very low proportion of total internet use, in fact they are the smallest group of internet users, at just 0.3% of the total number of users, and Thai senior educators also belong to this group. Regarding new technologies, however, Thai senior educators have more contact with them than other group of seniors. According to the Thai Government’s policy, these people are still needed. The policy extend the retire age of Thai senior educators has been raised from 60 to 65 and also encourages those who still have ability and good health to teach and continue to provide support in their education fields (Khaosod, 2002). Therefore, one aim of this study is to investigate how this group can become familiar with ICT and realize the gains from its use.

### 2.10 Theories related to the study

Andragogy is defined by Knowles (1970) as "the art and science of helping adults to learn", and has evolved to describe all adult learning. As this study concerns senior persons regarding their use and learning how to use ICT to support their professional goals, andragogy is important. In addition, the Characteristics of Adults as Learners (CAL) model and the difference between pedagogy and andragogy, as well as
other issues concerning adults and learning will be used to guide and frame the research and are detailed in the following section.

Principles of adult learning

Malcolm Knowles was important in establishing theories on how adults learn and in describing adult learning (Dunn, 2000). His concepts have been used widely and become accepted as principles of adult learning today (O'Brien, 2004).

Lieb (1991), Dunn (2000), LaLonde (2004), and O'Brien (2004) define the principles of adult learning from Knowles' theories as follows:

- Adult learners are “self-directed”. They need to be free to decide by themselves what they want to know or to learn. This includes implementing, planning and evaluating their learning activities. However, trainers can help them by acting as facilitators and guide participants rather than just supplying them with content.

- Adults prefer to learn, when they perceive the importance of new learning. They must see a reason for learning something and it has to be applicable to their work or other responsibilities and to be of value. Therefore, trainers must clearly identify the objective of learning and why learning things will be useful and help achieve goals.

- Adults have considerable knowledge, skills and experience from their past, far more than younger people. This is the difference between adults and younger people so trainers should consider this experience and use it as a resource to help them obtain new knowledge.

- All adult learners need to be shown respect. Trainers need to take into consideration the knowledge and experience that they bring into classes, they should allow them to voice their views freely, and encourage equal participation for all in the class.
These principles of adult learning need to be taken into consideration in this study. As such, a researcher must consider these concepts to obtain an understanding of the information received from the participants. The work of other theorists such as Merriam & Caffarella (1991, pp. 123-125), Mezirow (1999, pp.3-33) and Brookfield (1988, pp.3-50), is also of interest.

The Characteristics of the Adults as Learners (CAL) model.

The Characteristics of Adults as Learners (CAL) model was developed by Cross (1981) and integrates many elements from other theories. It involves two characteristics or variables, personal (aging, life phases, and developmental stages) and situational (part-time versus full-time learning, and voluntary versus compulsory learning). The model, based on these principles, will be used in the study and in the design of research tools. This model concerning adult learning will be used as a guideline for this research into Thai senior educators and their learning to use ICT. It helps the researcher to reach an improved understanding of the characteristics of senior educators and to design the research tools more meaningfully, especially the interviews. The particular principles that have influence this study are as follows:

- Adult learning programs should capitalize on the experience of participants.

- Adult learning programs should adapt to the ageing limitations of the participants.

- Adults should be challenged to move on to increasingly advanced stages of personal development.

- Adults should have as much choice as possible in the availability and organization of learning programs.
Differences between pedagogy and andragogy as learners:

Table 2.5 below shows the differences between pedagogy and andragogy in learning as defined by Mihail & Belloti (1999).

<table>
<thead>
<tr>
<th>Pedagogy</th>
<th>Andragogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rely on others to decide what is important to be learned</td>
<td>Decide for themselves what is important to be learned</td>
</tr>
<tr>
<td>Accept the information being presented at face value</td>
<td>Need to validate the information based on their beliefs and experience</td>
</tr>
<tr>
<td>Expect what they are learning to be useful in their long-term future</td>
<td>Expect what they are learning to be immediately useful</td>
</tr>
<tr>
<td>Have little or no experience upon which to draw are relatively &quot;clean slate.&quot;</td>
<td>Have much experience upon which to draw - may have fixed viewpoints</td>
</tr>
<tr>
<td>Little ability to serve as a knowledgeable resource to teacher or fellow classmates</td>
<td>Significant ability to serve as knowledgeable resource to trainer and fellow learners</td>
</tr>
</tbody>
</table>

Table 2.5: The differences between pedagogy and andragogy as learners

It can be seen from the above table that adults have certain special characteristics in their learning style which differ from those of younger students. Adults have a need to learn depending on their desires and will make decisions themselves based on their beliefs and experiences. These concepts are similar to the principles of adult learning and the CAL model and also are significant points for this study.

To sum up, this section has introduced a range of principles of adult learning that will have an impact on the study, the characteristics of adult learner models and the different learning patterns that apply to andragogy and pedagogy. They will be used to help the researcher design and account for research tools, understand the findings from the participants, and draw the conclusions of the thesis.
2.11 Similar study

There have been other studies relating to the use of ICT by older people but they have not been concerned with senior educators in Thailand and none provide significant evidence of beliefs, attitudes and needs in ICT.

A study similar to this research, "Lifelong learning, ICT, and elderly people" was carried out by Danni & Maria (2001). The authors focused on to what extent people aged 60 and above in the UK and Greece use public libraries, and particularly ICT, for lifelong learning purposes. It also identified the kind of services provided by these libraries to support the learning needs of elderly people. Emphasis was placed on ICT infrastructure and an analysis compared the findings showing what Greece could learn from the UK and it finally suggested ways for improvement in both countries.

The researchers found that older people used mainly printed documents such as books and newspapers and sometimes microfilms and CD-ROMs for information retrieval. ICT was mainly used for information retrieval and word processing. They often feel scared about the technology but are willing to try to use it provided someone instructs them. Finally their study shows that older people are concerned about where they can learn and what staffs support will be provided to encourage learning ICT.

Although this study has some similarities to the present study in terms of investigating the use of ICT by older people, it was conducted in Europe where ICT facilities are often quite sophisticated. It did not cover developing countries and was not specific about older people in particular careers. This research, does focus on a particular career group, senior educators in Thailand. The results of their study, however, are relevant to this thesis and will be used as a reference point in designing tools.
2.12 Summary

This chapter presents information on the ICT world, ICT in Thailand, and ICT in Education. It also mentions the relationship between older people and ICT, including senior educators in Thailand and reveals its importance in education. However, as the relationship between senior people and ICT is still low, so as to be able more research needs to be carried out on their attitudes, beliefs and needs to acquaint older persons of the advantages of using this powerful information tool.
3.1 Introduction

This chapter describes the study’s research methodology and includes the following sections: Research methodology, mixed methods (quantitative research and qualitative research), case study, data collection (Questionnaire surveys, In-depth Interviews), data analysis, sample, language translation and transcription, reliability and validity, ethical considerations, and conceptual framework.

3.2 Research methodology

There is a wide variety of methods that can be used to gather data for a research project. The most common distinction used in educational research is between quantitative and qualitative methods. Quantitative methods are usually based on collecting information in the form of numbers that produce a more generalisable picture of a problem (Bell, 1993) and qualitative methods is most effective for gathering information that contributes to the depth and detail of qualitative inquiry (Patton, 1990). However, as this research concerns the beliefs, attitudes, levels of needs and goals of a particular group of academic retirees in Thailand, to obtain answers to the research questions, quantitative methods were undertaken in the questionnaire surveys to explore their beliefs, attitudes, level of needs, and the best way for them to learn ICT. Qualitative methods, however, were required to obtain information in the In-depth interviews, therefore, the author believes that a mixed method, a combination of quantitative and qualitative research methods, is the most appropriate and it is used for this study.
3.3 Quantitative research

Quantitative research is a method which aims to explain and predict or to confirm and validate; it emphasizes the testing of theory supporting the research purposes. It concerns numbers, statistical data including numerical data and the methods of data collection, usually large samples (Leedy, 2001). It is also an investigation into the distinguishing characteristics, elemental properties, and empirical boundaries and tends to measure "how much or "how often" (Nou, 1995). The method is commonly based on collecting data, including questionnaire surveys (Bell, 1993).

3.4 Qualitative research

According to Hayllar & Veal (2000):

Qualitative research methods are concerned with collecting information which does not involve numbers. They typically focus on a small number of people and produce large amounts of information about these people (p. 30).

In addition, qualitative research seeks to gain insight into human characteristics such as motivation, attitudes and behaviour in order to increase the understanding of a problem (Bell, 1993). The methods were developed to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research, ethnography and grounded theory.

Myers (1997) suggested the choice of collecting data in qualitative research, for instance, can include observation, participant observation (fieldwork), interviews and questionnaires.
3.5 Mixed methods

Johnson & Onwuegbuzie (2004) defined mixed methods as follows:

Mixed method research is formally defined here as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study (p. 14).

In social and behavioral sciences, mixed methods are the most appropriate and more efficient in answering research questions rather than employing quantitative or qualitative approaches alone (Tashakkori & Teddlie, 1988).

Qualitative and quantitative methods can be integrated and used together as mixed methods. Stecker, McLeroy, Goodman, Bird, & McCormick (1992) have described the four main ways of integrating methods in their work as follows:

- Qualitative methods are used to develop quantitative measures; for example, focus groups used to develop questionnaire items.
- Qualitative methods are used to help explain quantitative findings; for example, in-depth interviews to find out why compliance in drug trial was low.
- Quantitative methods are used to help explain qualitative findings; for example, the observation that women are reluctant to participate in exercise is qualified by a survey which reveals that it is older women who participate least.
- Qualitative and quantitative methods are used together for cross-validation and triangulation; for example, before and after trials for smoking cessation is compared with recording of advice given, and in-depth interview with clients pre and post the intervention.

Using mixed research methods, combining qualitative and quantitative data is a methodology endorsed and used by many eminent researchers (Oburai, Wai, & Baker, 2005).

Previous researchers, for example, Chanslip (2003) chose mixed research methods incorporating quantitative approaches and qualitative for his study. A quantitative design, quasi-experimental, was chosen to determine if there would be
improved performance among students and qualitative design involving observation and interviews was used to explore the impact of the tool and to establish casual relationships between its use and the performance of the students.

The research of Oburai, Wai, & Baker (2005) also used mixed research methods to investigate patterns in marketing channels and international marketing strategies. The data collection in their study is exploratory and qualitative involving in-depth interviews of their samples and public sources.

Vncharaskunee (2000) conducted research concerning Thai teachers' beliefs on the topic "Target language avoidance by Thai teachers of English: Thai teachers' beliefs". Her study was based on survey methods and focus group interviews. A qualitative method was used with the interviews and a quantitative method was undertaken with the data from questionnaires.

For this research, the author has chosen mixed methods, combining quantitative and qualitative research, to accomplish the goals of the study, the details of which are outlined in the paragraphs on data collection.

3.6 Case study research

The research focus for this study concerns beliefs, attitudes, and goals of a particular group, academic retirees in Thailand. Therefore, the choice of the research method undertaken must be in line with the aims, the questions posed and the limitations of the research. The research method approached is "Case study research", details of which are outlined in the paragraphs below.

The term "Case study" has a variety of meanings. It can be used to describe a unit of analysis, for example, a case of a particular organisation or to describe a research method (Myers, 1997). According to Struman (1997) a case study is a generic term for the investigation of an individual, group or phenomena.
Orlikowski & Baroudi (1991) mention case study research as one type of qualitative method and the most commonly used in information systems. A distinguishing feature of the approach is that in order to explain, predict or generalise from a single case, it is necessary to conduct an "in-depth investigation of the interdependencies of parts and of the patterns that emerge" (Struman, 1997).

In addition, Yin (2002) defines the scope of a case study that it is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

This case study investigates Thai senior educators from Thai universities and how they utilise ICT to support their needs. In-depth information will be collected from this particular group to acquire answers to the research questions. The case study approach was chosen of this study focuses on a particular group of people. The answers to the research questions use mainly come from qualitative data so a case study methodology is suitable to investigate and analyse the information from a particular group.

3.7 Data collection

The study is concerned with investigating information from a specific group to answer the research questions and the data collection methods used include quantitative and qualitative techniques. The quantitative technique employed is a questionnaire survey (multiple choice and Likert scale forms) and the qualitative technique included open-ended questionnaires and in-depth interviews.

3.7.1 The Questionnaire Survey

Mitchell & Jolley (1988, p.288) state "A survey can be a relatively inexpensive way to get information about peoples' attitudes, beliefs, and behaviours". A questionnaire survey is one commonly used approach to obtain information or data from
n large number of people and is particularly useful when a respondent wishes to enjoy confidentiality (Hayllar & Veal, 2000).

The questionnaire survey is an important tool in this research for obtaining qualitative and quantitative data based on the research questions. It was used in the initial stage of collection, pilot testing and in the real testing stage. It consisted of open-ended, multiple choice questions and Likert scale forms and was sent by mail or delivered in person to participants.

3.7.2 In-depth Interviews

Another important tool for data collection in this study is the in-depth interview. Interviews were conducted with a small sub-group after the questionnaire survey had been completed. The results and information obtained from the initial stage were analysed and used to design the tools for the interviews and to aid in the selection of interviewees.

In general, interviews can contribute a great deal of useful information to a researcher. They can ask any related questions and observe any reactions from respondents, for example, the facts, people's beliefs about the facts, feelings, motives, present and past behaviours, standards of behaviour, and conscious reasons for actions or feelings (Silvennann, 1993). An in-depth interview usually involves a small sample (10 or less) to a site. (Hayllar & Veal, 2000).

Concerning collecting data by in-depth interviewing Berry (1999) states that:

There are many types of interviews that have been used for data collection, however, in-depth interviewing also, as known as unstructured interview or semi-structured interview, is now the one that is widely used in educational research and is generally regarded as a powerful tool in extracting data, in particular qualitative in nature (p. 1).

In this study, respondents who provided meaningful comments, interesting data and a range of opinions were selected for interview. The in-depth interview attempted to obtain greater depth of information on the research topic and act as a supplement to the data received from the questionnaire. The in-depth interview also tries to find out why respondents answered as they did on the questionnaire by asking probing questions.
3.8 Data analysis

Traditionally, qualitative data were analysed by hand, using a filing system (southalabama.edu, 2004). To date, computer software is now commonplace in analysing qualitative data (Jemmott, 2004). In this study, multiple choice data and the Likert scale data were analysed according to the frequency count and mean percentage calculations by using the computer software SPSS for Windows.

Another computer software package “NUDIST Vivo”, usually called “Nvivo”, was used for the open-ended questions and the in-depth interview stage. Nvivo ordinarily provides a guide through many options and possibilities in qualitative data analysis, assists researchers handling non-numeric unstructured data by indexing, searching and theorising. In addition, “it allows the researcher to manage documents and ideas easily, rigorously and flexibly, in symmetrical systems and it also helps the researcher to review the results of the coding qualitatively” (Lin, 2002).

3.9 Sample

In this study, the sample group is Thai senior educators from Thai universities. The size of the sample is difficult to gauge because factors, such as time, geography and change of address can possibly impose limitations. Therefore, the sampling was based on two methods; Purposive sampling and Availability sampling and only Thai senior educators living in Bangkok and its surroundings as far as possible were selected. The initial sample size of the survey was estimated at a minimum of 50 and a maximum of 100 respondents for the questionnaire survey and around 6 to attend an in-depth interview. However, in the real exploratory stage, respondents in the questionnaire survey totaled 160 and 8 interviewees attended in-depth Interviews. The real sizes were more than the initial estimations which was good for it gives a broader range of respondents' opinions.
3.10 Language, translation and transcription

The language used during the data collection was Thai, the main language of the population. Using the local language helps the researcher and participants to act in rapport. It also helps them to express themselves comfortably. In Thailand people speak Thai and many seldom speak, read or listen to English. The researcher, a Thai national speaks and understands Thai therefore, the challenges of note-taking or meanings and symbolism of words used did not affect the methodology and results of the research.

The data collection tools, the questionnaire for and the interviews, were conducted in Thai, however, they were translated into English. Results from the survey, interviews and the research were also translated. The transcriptions and translations were done by the researcher and were also double-checked by a professional translator from Thai to English.

3.11 Reliability and validity

Reliability and validity are two important considerations in any type of research method (Leedy, 2001). Generally, reliability means the consistency of measurement, the degree to which an instrument measures the same way each time it is used under the same conditions with the same subjects (Hingston, 2003a) and validity means the accuracy of the instrument for the purpose of measurement (Leedy, 2001).

In this research, the validity of the measurement and the instruments were analysed based on the Content Validity method. This makes the tools valid because they use the information and knowledge based on textbooks, literature reviews, and formal surveys related to the study. Moreover, they were prepared by the researcher to obtain detailed information for successful processing. In addition, the research measurements were also checked by experts (Appendix D), specialists able to make comments on and give feedback about the research tools before a try-out (Gatesigh, 2002).
In addition, the measurement and the instruments were trialed out with a small similar sample group of 12 (pilot testing) and after which they were tested for reliability by using Cronbach's Alpha technique (SPSS program). These techniques will contribute to the reliability and validity of the research measurements of this study before being used in the data collecting phase (see p. 37).

3.12 Ethical considerations

The awareness of ethical issues is an important aspect of any research that involves a human subject. A quote from Hingston (2003b) said “If you are going to do research, then you need to be aware of, and adhere to, the general agreements shared among researchers about what's proper and improper in the conduct of scientific inquiry”.

As this research does not expose participants to undue physical harm, there is no reason to believe that the study would present any risk to the lives of the sample group. However, it deals with human beings and it focuses on the investigation of personal beliefs, attitudes, and needs. Ethical considerations therefore, are also paramount in all aspects starting from research design (the questions for the questionnaire and the interviews) to the fieldwork period and finally to the writing of the thesis. Informed consent was present as a precaution for all tools or methods involved in the particular issues above. The names and addresses of research participants were kept secret and be identified only by an alphanumerical code, rather than their names or addresses. Documentary records were stored in a locked filing cabinet in the researcher's house in Thailand, the researcher being the only person with a key to the cabinet. The data on laptop were encrypted and protected by a password known only to the researcher. The data will be stored and retained for five years after the research project has been completed. They will be kept under the secure conditions mentioned above in Thailand after which they will be destroyed. The documents will be shredded and tapes of interviews wiped clean. Electronic data will be deleted by formatting and overwriting of the contents of the media using a file shredder software.

This enables sample groups to feel confident that the results of this study will not cause them any harm.
3.13 Conceptual framework

This study uses the mixed research method, using a selected sample group as a case study. The conceptual framework for the study is as follows:

![Conceptual Framework Diagram]

- **Explore and investigate literature**
- **Designing and developing the tools**
- **Pilot testing**
- **Collecting the data**
  - Questionnaire surveys
  - In-depth interviews
- **Analysis of the results, conclusions and recommendations**

Figure 3.1: Conceptual Framework

**Explore and investigate**

This stage aims to understand the beliefs, attitudes, and goals of Thai senior educators by conducting a literature review, formal research on the topic area of older peoples' use of ICT, the benefits of ICT for older people, ICT in educational societies past, present, and future, ICT situations in Thailand and the ICT concerning seniors in Thailand. The information was collected from documents, textbooks, journals, newspapers, similar research articles, Government policy papers, National master plan data and information from electronic sources such as the World Wide Web. In addition, it included interviewing experts on the ICT topic in order to prepare the research tools.
Designing and developing the tools

The questionnaires and semi-structured interviews forms were designed based on the research aims and planned to cover all the research questions. Information from the literature was used in this stage. The questionnaires contained multiple choice questions, Likert scale questions and open-ended questions and consisted of 5 sections. The aim of each section was as follows:

Section 1: The participant's profile,
Section 2: To explore senior Thai educators' beliefs in using ICT for their professional goals
Section 3: To explore senior Thai educators' attitudes in using ICT to achieve their professional goals
Section 4: To explore the level of the senior Thai educators' needs of ICT to achieve their academic goals
Section 5: To explore what ICT is suitable to support the senior Thai educators' goals
Section 6: To explore the best way of learning how to use appropriate ICT in the senior Thai educators' life.

(see Appendices B and C)

The semi-structured interview form was used to obtain in-depth information from the particular sample and to supplement questionnaire data. Both questionnaires and semi-interview forms were examined by experts who are specialists in this particular field and able to make comments and give feedback on the research tools in order to measure content validity before the pilot test. The experts included four senior lecturers and a non-teaching researcher from a Thai university.

Ethical considerations of the research tools were reviewed and have been granted ethical approval by The ECU (Edith Cowan University) Human Research Ethics Committee (HREC). The comments were valuable for amendments which were incorporated into the final questionnaire. The Informed consent form and the information letters to participants were prepared as a precaution for both questionnaires and the interviews for pilot testing and real testing each time.
Pilot testing

The questionnaires were sent for sample pilot testing in Thailand in order to test the reliability of the tools. The feedback from the 21 samples was analyzed for reliability using the SPSS program. The results were very good and produced a very high reliability. Below are the reliability figures in Sections 2, 3 and 4 of the questionnaire which are the rating scale questions asking about beliefs, attitudes, and levels of their needs.

In Section 2: To explore senior Thai educators' beliefs in using ICT for their professional goals

Questions 2.1.1-2.1.4 = .8889
Questions 2.2.1-2.2.6 = .9019
Questions 2.3.1-2.3.7 = .8025
Questions 2.4.1-2.4.6 = .9091

In Section 3: To explore senior Thai educators' attitudes in using ICT to achieve their professional goals

Questions 3.1-3.10 = .9261

In Section 4: To explore the level of the senior Thai educators' needs of ICT to achieve their academic goals

Questions 4.1-4.10 = .8733

Total (Section 2-4) = .9070

However, Sections 1, 5 and 6 could not be tested for reliability because these sections were about profiles and some asked about facts, for instance, "What was your last or current educational position?", "How long do you think you want to continue to work?" or "Do you use ICT in your work time?" etc.

For the interview part, a small pilot sample was interviewed in Thailand and another relevant sample was obtained from Perth.

Collecting the data

This stage included 2 phases, the questionnaire survey and in-depth interviews. In the first phase, the results were analysed and in-depth interviews prepared for the next step.
Analysis of the results, conclusions and recommendations

This phase consists of data analysis, conclusion and recommendations. Two different types of data, Quantitative data and Qualitative data, were analysed.

First, the results of the Quantitative data from the questionnaires included descriptive statistics data and correlation data. Descriptive statistics results illustrated the frequency and the percentage in order to compare the variables and the results and the correlation results showed the relationships between two or more variables in this study. The correlation technique used Pearson's r technique to calculate and to find the magnitude of the relationship and its statistical significance. These particular data were analysed using computer software SPSS (version 11.0 for WINDOWS).

The Qualitative results from the interview and open-end questions were analysed via the NVivo program. These responses were collected as Word documents and imported as rich text where they were coded line by line into NVivo. This program has assisted the researcher and enhanced the analysis of qualitative data in combining subtle codes, linking the data and searching the data of the participants.

Finally, conclusions were reached and recommendations suggested at the end of this stage and can be found in Chapter 5.

3.14 Conclusions

The methodology used for this study was a mixed methods, a combination of the Quantitative method and the Qualitative method. The case study focus in this study was Thai senior educators from Thai universities who live in Bangkok and its surrounds. A Quantitative questionnaire was used in the first phase of the data collection with a sample size of 160 participants. The second phase was an In-depth Interview, a Qualitative method and 11 interviewees were selected. Pilot testing was carried out to test the reliability of the tools before real collection of the data. Copies of the questionnaire questions and the semi-structured interviews forms are in Appendices B and C.
CHAPTER 4
RESULTS

4.1 Introduction

This chapter will present the analysis of the results; quantitative data, questionnaire survey and the qualitative data, open-ended questions and in-depth interviews in order to answer each of the research questions. It contains two sections. First, the descriptive data of all participants and second, the results of the questionnaire survey will be reported using descriptive statistics relating to the goals and will cover all the research questions.

In addition, the qualitative results from the open-ended questions and the in-depth interviews of interviewees will provide answers to the research questions in more detail according to each research question in this section.

The procedure for the analysis of the interview transcripts was analyzed and using the computer software package NUD.IST NVivo.

4.2 Descriptive results: participants’ questionnaire data

Out of the 220 questionnaires sent out, 160 were returned. The distributions of the demographic characteristics are summarized in Table 4.1 and Figure 4.1.
4.2.1 Gender

![Gender Pie Chart]

Figure 4.1: Percentages of the gender of participants

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>68</td>
<td>42.5</td>
</tr>
<tr>
<td>Female</td>
<td>91</td>
<td>56.9</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>99.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.1: Gender of the participants

From the data above, it can be seen that the percentage of males and females were 42.5% and 52.9% respectively and 0.6% were of unknown gender. The percentage of the sexes between males and females is not very different which is good for balancing participants’ opinions. It is also in line with the Thai population data relevant to this study. For example:

- According to data from the Department of Provincial Administration (Thailand) in 2005, the percentages of Thai males and females are 49.38% and 50.62% respectively (DOPA.Dep, 2005).

- The percentages of Thai seniors over 60 between males and females from 1993-1997 were 54.39% and 45.61%, 55.09% and 45.01%, 53.72% and 46.28%, 53.95% and 46.05% respectively (nso.go.th, 2005).

- In addition, the percentages of Thai males and females who graduated in education and teaching programs from Thai universities were 47.26% and 52.74% respectively (mua.go.th, 2005).
According to the Thai population data above and the numbers of participants in this study, the ratio of the percentages of Thai males to females in the data are not very different.

4.2.2 Age

![Graph showing age distribution]

**Figure 4.2: Percentages of the ages of participants**

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>63</td>
<td>38</td>
<td>23.8</td>
</tr>
<tr>
<td>62</td>
<td>53</td>
<td>33.1</td>
</tr>
<tr>
<td>61</td>
<td>38</td>
<td>23.8</td>
</tr>
<tr>
<td>60</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
<td>91.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table 4.2: Ages of participants**

In Figure 4.2, most of the senior educators in the sample were between 61-63. Even though 60 is the official age for retirement of Thai public servants, some still have the desire and ability to work and contribute to society.
4.2.3 Current position

Figure 4.3: Percentage of the last or current educational position of participants

<table>
<thead>
<tr>
<th>Position</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>Assistant Prof.</td>
<td>59</td>
<td>36.9</td>
</tr>
<tr>
<td>Associate Prof.</td>
<td>72</td>
<td>45.0</td>
</tr>
<tr>
<td>Professor</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>99.4</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.3: Last or current educational position of participants

In Figure 4.3, it can be seen that the last or current position of the senior educators in this sample were Associate Professors (45%) and Assistant Professors (36.9%) respectively which means most of the participants in this sample have a high level of knowledge, skills and experience in their fields.

4.3 Answering the Research Questions

In this section, the discussions are based on the two major research questions. The first concerns the professional goals of senior educators in Thailand. The second illustrates the beliefs of senior educators in Thailand regarding which is the best way for them to learn ICT.
The first major questions

4.3.1 Research Question 1: "What are their professional goals?"

The methodology used to collect the data to explore the answer to this question is
data collection from the questionnaire survey, data correlation of questions, and
qualitative data from open-ended question and in-depth interviews.

4.3.1.1 Data collection from questionnaires

To answer this particular question, the 5 questions below from the questionnaire
were used in the analysis as follows:

• Do you think your current skills and abilities can continue to be used to support
  your work in your professional life?
• Will you keep working to support your professional life?
• How long do you think you want to continue to work?
• Which of these activities are you currently doing that involve your educational skills
  and abilities?
  o Classroom lecturer
  o Instructional Aid design and development
  o Curriculum specialist
  o Special education lecturer
  o Administrator
  o Researcher
  o Academic writer
  o Consultant
  o Others
• Which of these activities do you intend to do in the future?
  o Classroom lecturer
  o Instructional Aid design and development
  o Curriculum specialist
  o Special education lecturer
  o Administrator
  o Researcher
  o Academic writer
  o Consultant
  o Others
Current skills and abilities

![Pie chart showing current skills and abilities](image)

Figure 4.4: Current skills and abilities of senior educators to support their professional life

<table>
<thead>
<tr>
<th>Do you think your current skills and abilities can continue to be used to support your work in your professional life?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>132</td>
<td>82.5</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Not sure</td>
<td>23</td>
<td>14.4</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>98.8</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.4: Current skills and abilities of senior educators to support their professional life

From the results of the participants on this issue, Figure 4.4 and Table 4.4 show that 82.5% of the participants think their current skills and abilities can still be used to support their work in their professional life. Only 1.9% denied that their skills and abilities can assist in their work and 14.4% are not sure at the moment. This result confirms that the majority of senior educators in Thailand believe they are a good human resource able to use their knowledge, skills, and experience to assist society.
Will they keep working to support their professional life?

Figure 4.5: Keeping working to support their professional life

<table>
<thead>
<tr>
<th>Will you keep working to support your professional life?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>109</td>
<td>68.1%</td>
</tr>
<tr>
<td>No</td>
<td>31</td>
<td>19.4%</td>
</tr>
<tr>
<td>Not sure</td>
<td>18</td>
<td>11.3%</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>98.8%</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>1.3%</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4.5: Keeping working to support their professional life

The question asks “Will they keep working to support their professional life?” The answers were; 68.1% will continue, 19.4% will not and 11.3% are still not sure whether to work or not to work. Most of them do not want to stop working even though they are retired. They desire to continue working in their professional life which is good both for the senior educators themselves and for society too.
Most senior educators who still work after retiring said they want to continue to work for 1-5 years (36.3%), 26.9% said they wanted to work as long as they could, 3.8% denied wanting to work. There were respondents who did not answer this question [Missing data] about 27.5%. The number of people in this particular group also included people who said in the previous question (Figure 4.5) that they will not keep working to support their professional life (15.6%).

However, the overall impression from these results is most senior educators do not want to stop working in their fields but intend to continue to use their knowledge, skills and experience to work even though they have already retired.
Current activities of senior educators

Figure 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities?

<table>
<thead>
<tr>
<th>Question 1.5</th>
<th>Frequency</th>
<th>Percent of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom lecturer</td>
<td>39</td>
<td>9.9</td>
</tr>
<tr>
<td>Instructional Aid design and development</td>
<td>16</td>
<td>4.1</td>
</tr>
<tr>
<td>Curriculum Specialist</td>
<td>31</td>
<td>7.9</td>
</tr>
<tr>
<td>Part time Lecturer</td>
<td>90</td>
<td>22.8</td>
</tr>
<tr>
<td>Administrator</td>
<td>20</td>
<td>5.1</td>
</tr>
<tr>
<td>Researcher</td>
<td>37</td>
<td>9.4</td>
</tr>
<tr>
<td>Academic writer</td>
<td>53</td>
<td>13.4</td>
</tr>
<tr>
<td>Consultant</td>
<td>82</td>
<td>20.8</td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
<td>6.6</td>
</tr>
<tr>
<td>Total</td>
<td>394</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities?

From Figure 4.7, it can be seen that the two most popular areas senior educators are currently involved in are special education lecturers and consultants (22.8% and 20.8% respectively). A further 13.5% were academic writers. Classroom lecturers and researchers were 9.9% and 9.4%. The minimum percentages of responses selected for administrators and instructional aid design and development were 5.1% and 4.1%. From the results, it can be seen that after retiring, senior educators still keep working in a range of academic fields.
Future activities senior educators intend to do

Which of these activities do you intend to do in the future?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Percent of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom lecturer</td>
<td>23</td>
<td>6.4</td>
</tr>
<tr>
<td>Instructional Aid design and development</td>
<td>16</td>
<td>4.4</td>
</tr>
<tr>
<td>Curriculum Specialist</td>
<td>21</td>
<td>5.8</td>
</tr>
<tr>
<td>Special Education Lecturer</td>
<td>88</td>
<td>24.3</td>
</tr>
<tr>
<td>Administrator</td>
<td>14</td>
<td>3.9</td>
</tr>
<tr>
<td>Researcher</td>
<td>41</td>
<td>11.4</td>
</tr>
<tr>
<td>Academic writer</td>
<td>51</td>
<td>14.1</td>
</tr>
<tr>
<td>Consultant</td>
<td>79</td>
<td>21.9</td>
</tr>
<tr>
<td>Others</td>
<td>28</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>361</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.8: Activities that senior educators intend to do in the future

The activities senior educators intend to do in the future according to Figure 4.8 are special education lecturers and consultants 24.4% and 21.9% respectively. 14.1% of responses said they intend to be academic writers, whereas 11.4% want to be researchers. The researcher noticed the minimum percentages of responses are 4.4% and 3.9% for administrators and instructional aid design and development. In addition, the results also indicate that most like to work as lecturers (including classroom lecturers and part time lecturers) therefore it can be said that teaching, the main activity of all educators, is still their favorite occupation.
Figure 4.9: A comparison between current activities of senior educators and the future activities they intend to do

A comparison of the percentages between each current activity of senior educators and each activity that they intend to do in future from Figure 4.9 shows the ranges are similar. Most activities senior educators wish to do in the future remain the same as at present. However, the percentages of three future activities are lower than before: Classroom lecturers, Curriculum specialists, and Administrators. This is perhaps because the work loads and time schedules need to be considered more than other activities, for example, classroom teaching, curriculum specialists and administrators as they impact on their personal time as retirees.
### 4.3.1.2 Data correlation

Data correlations represent the relationships of two variables. The following shows the inter-correlation matrix of the data participants provided for each question. These data will be used to answer Research Question 1: What are Thai senior educators' professional goals.

The inter-correlation matrix between:

**Question 1.2:** Do you think your current skills and abilities can continue to be used to support your work in your professional life?

**Question 1.3:** Will you keep working to support your professional life? If yes, please describe your professional goals.

<table>
<thead>
<tr>
<th></th>
<th>Q1.2</th>
<th>Q1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1.2</td>
<td></td>
<td>.395 **</td>
</tr>
<tr>
<td>Q1.3</td>
<td>.395 **</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

*(r = .395, p = .001)*

Table 4.9 Correlation of two variables

From the correlation coefficients shown in Table 4.9, both variables (Questions 1.2 and 1.3) have a positive correlation (r = .395, p = .001), that means senior educators who think that their current skills and abilities can continue to be used to support their work in their professional life are willing to keep working.
In addition, there is a strong positive correlation among the current activities of the participants and the activities they intend to do in the future. The correlation matrix table, Table 4.9a, is as follows:

<table>
<thead>
<tr>
<th>Future activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.721***</td>
<td>.019</td>
<td>.023</td>
<td>.109</td>
<td>.006</td>
<td>.197*</td>
<td>.202*</td>
<td>.077</td>
</tr>
<tr>
<td>2</td>
<td>.005</td>
<td>.722***</td>
<td>.047</td>
<td>.042</td>
<td>.063</td>
<td>.015</td>
<td>.20</td>
<td>.033</td>
</tr>
<tr>
<td>3</td>
<td>.048</td>
<td>.036</td>
<td>.746***</td>
<td>.082</td>
<td>.133</td>
<td>.182*</td>
<td>.198*</td>
<td>.194*</td>
</tr>
<tr>
<td>4</td>
<td>.075</td>
<td>.034</td>
<td>.157*</td>
<td>.747***</td>
<td>.009</td>
<td>.109</td>
<td>.210**</td>
<td>.374**</td>
</tr>
<tr>
<td>5</td>
<td>.073</td>
<td>.104</td>
<td>.184*</td>
<td>.050</td>
<td>.619***</td>
<td>.012</td>
<td>.017</td>
<td>.189*</td>
</tr>
<tr>
<td>6</td>
<td>.234***</td>
<td>.005</td>
<td>.202***</td>
<td>.171*</td>
<td>.124</td>
<td>.731***</td>
<td>.286**</td>
<td>.257**</td>
</tr>
<tr>
<td>7</td>
<td>.299***</td>
<td>.130</td>
<td>.242***</td>
<td>.225*</td>
<td>.066</td>
<td>.197*</td>
<td>.773***</td>
<td>.291**</td>
</tr>
<tr>
<td>8</td>
<td>.007</td>
<td>.004</td>
<td>.275**</td>
<td>.357***</td>
<td>.269**</td>
<td>.170*</td>
<td>.314**</td>
<td>.788***</td>
</tr>
</tbody>
</table>

Table 4.9a Correlation matrix of the current activities of the participants and the activities they intend to do in the future

1 = Classroom lecturer
2 = Instructional Aid design and development
3 = Curriculum specialist
4 = Part time lecturer
5 = Administrator
6 = Researcher
7 = Academic writer
8 = Consultant

From Table 4.9a, it can be seen that the correlation between current activities and the activities that each person intends to do in the future have strong positive correlations which mean most senior educators would still like to continue doing the same thing in future.

For example, most senior educators whose current activity is classroom teaching intend to continue it in future ($r = .721, p = 0.001$).
4.3.1.3 Qualitative data collection

The qualitative data collection consists of open-ended question and in-depth interviews.

- The open-ended question

To explore senior educators’ opinions in more detail, the questionnaire survey provided open-ended question in order to obtain supplementary information to support this particular research question. The question was “Will you keep working to support your professional life? If yes, please describe what your professional goals are?

Participants who said that they would keep on working to support their professional life described their professional goals and some of their opinions in the open-ended Question 1.3. The opinions of senior educators about their professional goals can be summarized in two groups as follows:

Firstly, the professional goals that provides benefits directly for themselves. This also includes their personal preferences.

Example opinions such as:

"I hope to develop my general knowledge"
"I would like to be an academic writer"
"I would like to be an advisor"
"I like to be a lecturer"
"I would like to continue developing my performance"
"I will develop myself for the new technology"

Secondly, the professional goals providing benefits for themselves and society were expressed as follows:

"I publicize my experience by writing articles for the Engineering Society Association"
"I provide knowledge and experience to the youth in order to help them to be effective persons in society"
"I use my skills and abilities to work for society"
"I would like to publicize my experience"

"I would like to explore the new know-how and apply it to my present experience and make it available to the new generation"

"I would like to be a lecturer for general people and people who lack education"

"I would like to do research and to evaluate Government projects and private organizations"

"I will provide knowledge to students and general people"

"I intend to provide knowledge in education for society"

"I would like to develop people in society so that they can gain knowledge and use it"

"To provide knowledge for society and young people in order to make them good persons for the country"

"I intend to provide my knowledge and experience for the public"

"I am seeking new knowledge and would like to provide it to students as much as I can"

* In-depth Interviews:

Eight participants took part in the in-depth interviews. The details of which are in the following table:

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Gender</th>
<th>Job/Position before retiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee A</td>
<td>Female</td>
<td>A former university vice president</td>
</tr>
<tr>
<td>Interviewee B</td>
<td>Female</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee C</td>
<td>Male</td>
<td>A formal university lecturer/ Asst. Prof.</td>
</tr>
<tr>
<td>Interviewee D</td>
<td>Female</td>
<td>A formal university lecturer/ Asst. Prof</td>
</tr>
<tr>
<td>Interviewee E</td>
<td>Male</td>
<td>A formal university lecturer/ Asst. Prof</td>
</tr>
<tr>
<td>Interviewee F</td>
<td>Male</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee G</td>
<td>Female</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee H</td>
<td>Male</td>
<td>A former university lecturer/ Asst. Prof</td>
</tr>
</tbody>
</table>

Table 4.9b Brief of interview respondents' backgrounds
The interviews were particularly useful in seeking in-depth information to support and answer research questions. The questions were a semi-interview transcript form and in this issue, interviewees were asked their opinions about life after retirement. They were guided by the following sub-questions on:

- Work status
- Work detail
- Motivation

**Work status**

The interviewer asked about the work status of the participants and answers indicated they would all like to continue working in their academic fields or other fields and use their academic knowledge, skills and experience. However, they did not wish to have a 100% workload as they did before retiring.

This is an example of the interview question

"...From your feedback, I know that you have already retired, however you are still working in the academic field aren't you?"

Here are examples of interviewees' responses,

"Yes I am but only 1 day a week. Um I also am an advisor for a factory"

(Interviewee H, a male Assistant professor)

"Yes, I teach at Master Degree level"

(Interviewee A, a female former university Vice President)

"Yes, a little bit"

(Interviewee B, a female senior university lecturer)

"Yes, I am. I still teach regularly as a part time lecturer for 3 universities"

(Interviewee D, a female Assistant professor)

"After retiring I taught for 3 years. Now I have just stopped my teaching, however, I will take it up again if I am required"

(Interviewee E, a male Assistant professor)

"Yes, I still teach at the university"

(Interviewee G, a female senior university lecturer)
Work details

The interviewer asked about their kind of job and if it was similar to the job they did before retirement or not.

The interview questions were:

"What is your job about?"
And "Is your job similar to the jobs you had before retiring?"

Examples of interviewees' responses were:

"Not at all but some things are similar, I apply my knowledge and experience to work for the factory"

(Interviewee H, a male Assistant professor)

"After retiring, I have been a part time lecturer and Masters Degree's advisor and also write academic text books."

(Interviewee G, a female senior university lecturer)

"I am a part time lecturer, a trainer, and work for the financial department in my university. ... Some things are similar, for example, being a lecturer and an advisor for the new colleges."

(Interviewee C, a male Assistant professor)

"I am a technical advisor for an industrial company and advise on students' projects."

(Interviewee B, a female senior university lecturer)

"I use a computer to develop computer software, create a website by using HTML, and am now writing 2 academic text books about computer application software. ... I have stopped teaching for a while because I have to take care of my grandchildren. However, when they grow up I may go back to teach again because my faculty is asking me to help them again. Whenever I have time, I will be back."

(Interviewee F, a male senior university lecturer)
Motivation

The participants also explained what motivated them to work even though they had already retired. Their motivation can be divided into 4 factors:

Factor 1: The convenience
An example of an interviewee's response:

"Umm it so happens that it is convenient. Everything is there so I like to work."

(Interviewee H, a male Assistant professor)

Factor 2: Professional dedication
Examples of interviewees' responses:

"Whatever I have learnt I would like to let other people know as well. I do not want to keep it only for myself."

(Interviewee B, a female senior university lecturer)

"I would like to transfer my knowledge, skill and experience to the new generation as long as I can because these things if I keep them to myself, I will forget and the knowledge will be lost. Therefore, as I still can work, I will work and provide knowledge according to their requests."

(Interviewee F, a male senior university lecturer)

"I love being a teacher so much. When I had just graduated, I worked for international organization and my family and I had many chances to go abroad for work and study. I obtained a great deal of knowledge and experience from this and I would like to share my experience with other people and my students. I would like them to have an opportunity like me and would like to see them to be good members of society."

(Interviewee A, a female former university vice president)

"I would like to provide knowledge from my experience for my students. Now I am doing just that."

(Interviewee G, a female senior university lecturer)

"I still have enough energy therefore, if there is anything helpful that I can do for society, I am happy to do it."

(Interviewee C, a male Assistant professor)
"I like to work and learn new things."

(Interviewee D, a female Assistant professor)

Factor 3: Concern for their students
Examples of interviewees' responses:

"I am thinking of my students. I would like to provide them with knowledge. That is what I want to do."

(Interviewee H, a male Assistant professor)

Factor 4: Personal beliefs
Examples of interviewees' responses:

"I believe in that if we give our knowledge freely, then we will receive good things back."

(Interviewee B, a female senior university lecturer)

"I am a person who wants to teach because when I teach somebody else, I also practise and gain knowledge too."

(Interviewee H, a male Assistant professor)

4.3.1.4 Summary

The results in this part are from the questionnaire, data correlation of questions, and the qualitative data from open-ended question and in-depth interviews provide answers for research Question 1 showing:

- The majority of senior educators believed that their current skills and abilities can continue be used to support their work in their professional life and they are willing to keep working.

- Most of them think they have the ability to work and want to continue working at least 5 years or as long as they can.

- After retiring, senior educators still use their knowledge, skills and experience to support their activities in both current and future activities.
• Most of their activities are similar to those they did before retiring but their work load is less.

• Professional goals include professional goals that benefit themselves and society.

• The participants detailed the motivation that led them to continue working in categories such as convenience, professional dedication, concern for students, and personal beliefs.
4.3.2 Research Question 2:

"What are their attitudes about using ICT to achieve their professional goals?"

In order to explore the attitudes of senior educators about using ICT to achieve their professional goals, two methodologies, data collection from the questionnaire surveys (Likert scale forms) and data correlation, were used to collect and analyse the data. The results of the two methods are described in more detail below.

4.3.2.1 Data collection from questionnaires

The 10 Likert scale questions from the questionnaire 3.1-3.10 in Section 3 indicate the attitudes of senior educators to using ICT to achieve their goals. The lists of questions and the results in this particular section are as follows.

Section 3, the questions indicate how much you agree or disagree with the following statements. The numbers 1-5 that respondents put beside each statement most accurately reflect their views.

5 = strongly agree 4 = agree 3 = neither agree nor disagree
2 = disagree 1 = strongly disagree

- Question 3.1 Computers and the Internet now play great roles in education
- Question 3.2 ICT is only suitable for younger people
- Question 3.3 Everybody should know how to use a computer and the Internet
- Question 3.4 Educators should know how to use computers and the Internet
- Question 3.5 Using ICT helps me to gain more skills, experience, and better performance in my professional goals
- Question 3.6 ICT will provide more advantages for my professional life than disadvantages
- Question 3.7 I am quite familiar with using ICT in my professional life.
- Question 3.8 ICT is not hard to use if I have a good advisor to guide me
- Question 3.9 I should not fear using ICT
- Question 3.10 The computer and the Internet are important in supporting my academic goals
Computers and the Internet now play great roles in education

Figure 4.10: How much senior educators agree or disagree with “Computers and the Internet now play great roles in education”

<table>
<thead>
<tr>
<th>Question 3.1</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>133</td>
<td>83.1</td>
</tr>
<tr>
<td>4 agree</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.10: How much senior educators agree or disagree with “Computers and the Internet now play great roles in education”

Figure 4.10 shows the attitudes of senior educators to the statement “Computers and the Internet now play great roles in education”. Most strongly agree (83.1%), a few hold other opinions but no one selected “strongly disagree”. This shows that nowadays senior educators believe ICT plays an important role and has an influence on education.
Regarding the assertion “ICT is only suitable for young people”, from Figure 4.11 it can be seen that 35% of respondents strongly disagree and 27.5% agree with “ICT is only suitable for younger people”. However, some respondents are still not sure (16.3%) and some either considered it is not suitable or strongly not suitable for them but this number of people constituted only a small percentage overall, 11.9% and 5.6% respectively. The results show there is a strong trend among senior educators towards accepting that new technology is not only for specific groups of people, for instance, younger people, but may be suitable for anyone who is interested in it.
Everybody should know how to use a computer and the Internet

![Bar chart showing frequency of responses to the question about knowing how to use a computer and the Internet.]

Figure 4.12: How much senior educators agree or disagree with “Everybody should know how to use a computer and the Internet”

<table>
<thead>
<tr>
<th>Question 3.3</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>69</td>
<td>43.1</td>
</tr>
<tr>
<td>4 agree</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>19</td>
<td>1.9</td>
</tr>
<tr>
<td>2 disagree</td>
<td></td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td><strong>160</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 4.12: How much senior educators agree or disagree with “Everybody should know how to use a computer and the Internet”

Most senior educators either strongly agree or agree that everybody should know how to use a computer and the Internet (43.1% and 41.3% respectively). This result supports the results in Figures 4.10 and 4.11 that ICT is now important and everyone should know how to use it. Therefore, there is no doubt why the percentage of people who disagree with this statement is very low (0.6%) and nobody selected “strongly disagree” (0%).

62
Educators should know how to use computers and the Internet

Figure 4.13: How much senior educators agree or disagree with
"Educators should know how to use computers and the Internet"

<table>
<thead>
<tr>
<th>Question 3.4</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>120</td>
<td>75</td>
</tr>
<tr>
<td>4 agree</td>
<td>32</td>
<td>20</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>96.3</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.13: How much senior educators agree or disagree with
"Educators should know how to use computers and the Internet"

The results to this particular question in Figure 4.13 show that most senior educators agree with "Educators should know how to use computers and the Internet". The percentages of respondents who strongly agreed and agree are 75% and 20% respectively. Again, a few respondents disagreed (1.3%) and no one strongly disagreed (0%) with this statement. This result shows that these senior educators believe all people in education should know how to use ICT.
Using ICT helps me to gain more skills, experience, and better performance in my profession goals

Figure 4.14: How much senior educators agree or disagree with

"Using ICT helps me to gain more skills, experience, and better performance in my professional goals"

<table>
<thead>
<tr>
<th>Question 3.5</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Strongly agree</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>4 agree</td>
<td>57</td>
<td>35.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>2 disagree</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.14: How much senior educators agree or disagree with

"Using ICT helps me to gain more skills, experience, and better performance in my professional goals"

Figure 4.14 shows 48.8% of respondents strongly agree that using ICT can help them to gain more skills, experience, and better performance in their professional goals. Only 2% disagree and 0% strongly disagree with this statement. This means senior educators think ICT is useful for achieving their professional goals.
ICT will provide more advantages for my professional life than disadvantages

Figure 4.15: How much senior educators agree or disagree with

"ICT provides more advantages for my professional life than disadvantages"

<table>
<thead>
<tr>
<th>Question 3.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>4 agree</td>
<td>57</td>
<td>35.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>2 disagree</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.15: How much senior educators agree or disagree with

"ICT provides more advantages for my professional life than disadvantages"

Figure 4.15 shows 43.8% of respondents strongly agree and 35.6% agree that ICT provides more advantages than disadvantages for their professional life. Just a few people dispute this statement but the percentage is very low. In addition, no one strongly disagreed with this particular statement (0%). From these results, it can be seen that even though some people think ICT may have some weaknesses, the attitude of the majority of senior educators is that it provides them with more advantages than disadvantages.
I am quite familiar with using ICT in my professional life

Figure 4.16: How much senior educators agree or disagree with "I am quite familiar with using ICT in my professional life"

<table>
<thead>
<tr>
<th>Question 3.7</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>31</td>
<td>19.4</td>
</tr>
<tr>
<td>4 agree</td>
<td>54</td>
<td>33.8</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>2 disagree</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>1 strongly disagree</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.16: How much senior educators agree or disagree with "I am quite familiar with using ICT in my professional life"

The percentages of respondents who agree and who neither agree nor disagree for this particular question do not show a wide gap. Figure 4.16 shows even though the most respondents agree that they are quite familiar with using ICT in their professional life (33.8%), however, 28.1% of respondents are still not sure whether they agree or disagree with this or not. On the other hand some respondents disagree (9.4%) and strongly disagree (5%) as well. This result can be interpreted to mean that not all senior educators are familiar with ICT; some are still not familiar with it at all.
ICT is not hard to use if I have a good advisor to guide me

Figure 4.17: How much senior educators agree or disagree with

"ICT is not hard to use if I have a good advisor to guide me"

<table>
<thead>
<tr>
<th>Question 3.8</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>59</td>
<td>36.9</td>
</tr>
<tr>
<td>4 agree</td>
<td>73</td>
<td>45.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.17: How much senior educators agree or disagree with

"ICT is not hard to use if I have a good advisor to guide me"

Figure 4.17 shows 45.6% agree and 36.9% strongly agree that ICT is not hard for them to use if they have a good advisor. Respondents who are not sure whether to agree or disagree are 11.9%. Only 1 person disagrees and no one strongly disagreed with this statement. This result means senior educators think it is not hard for them to learn ICT if they have an advisor. On the other hand, providing a good advisor is no guarantee he/she will to help them learn ICT because the majority of respondents agree but not strongly agree with this statement.
I should not fear using ICT

![Graph showing percentage of respondents]

Figure 4.18: How much senior educators agree or disagree with

"I should not fear using ICT"

<table>
<thead>
<tr>
<th>Question 3.9</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>67</td>
<td>41.9</td>
</tr>
<tr>
<td>4 agree</td>
<td>61</td>
<td>38.1</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>1 strongly disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.18: How much senior educators agree or disagree with

"I should not fear using ICT"

Figure 4.18 shows 41.9% of respondents strongly agree and 38.1% agree that they should not fear to use ICT. Even though 13.8% neither agree nor disagree, only 0.6% disagree and 1.3% strongly disagree with this point. From these results, the trend is, 80% of them agree which means they are ready to learn ICT without fear of the new technology.
The computer and the Internet are important in supporting my academic goals

Figure 4.19: How much senior educators agree or disagree with

"The computer and the Internet are important in supporting my academic goals"

<table>
<thead>
<tr>
<th>Question 3.10</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>14.4</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.19: How much senior educators agree or disagree with

"The computer and the Internet are important in supporting my academic goals"

Figure 4.19 shows 41.3% of respondents agree and 35% strongly agree that the computer and the Internet are important in supporting their academic goals. Some respondents neither agree nor disagree with this point (14.4%) while 3.8% and 1.3% disagree and strongly disagree respectively. From these results it can be seen that the majority of senior educators agree and strongly agree that ICT such as the computer and the Internet are important for their jobs. These results are also in line with the previous results (Figures 4.10-4.15).
4.3.2.2 Data correlation

In order to acquire clear answers to the research questions "What are their attitudes about using ICT to achieve their professional goals?" data correlations in this particular section analysed the attitudes of participants among the different variables. The details are described in the following section:

The inter-correlation matrix of how much they agree or disagree with each statement among Question 3.1: Computer, and the Internet now play great roles in education and the following questions:

- Question 3.3: Everybody should know how to use a computer and the Internet
- Question 3.4: Educators should know how to use computers and the Internet
- Question 3.5: Using ICT helps me to gain more skills, experience, and better performance in my profession goals
- Question 3.6: ICT will provide more advantages for my professional life than disadvantages

Correlations

<table>
<thead>
<tr>
<th>Pearson's Correlation</th>
<th>Q3.3</th>
<th>Q3.4</th>
<th>Q3.5</th>
<th>Q3.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

Table 4.19a Correlation of two variables

The table of the correlation coefficients shows the results from Question 3.1 have positive correlations with Question 3.3, 3.4, and 3.5 ($r = .739$, $p = .001$), ($r = .773$, $p = .001$), ($r = .616$, $p = .001$), and ($r = .728$, $p = .001$) respectively. From these results, it can be seen that senior educators who agree computers and the Internet now play great roles in education also agree that it provides more advantages for their professional life than disadvantages. They also believe that using ICT can help them to gain more skills, experience, and achieve better performance in their profession goals. Finally, they think everybody should know how to use a computer and the Internet and in particular, senior educators.
4.3.2.3 Summary

The results in this section showed that the attitudes of senior educators about using ICT to achieve their professional goals tend to be positive. The results of the data collection from the questionnaires can be summarized as follows:

Senior educators in Thailand believe:

- Computers and the Internet now play great roles in education
- ICT is not just suitable for younger people
- Everybody should know how to use a computer and the Internet
- Educators should know how to use computers and the Internet
- Using ICT helps them to gain more skills, experience, and achieve better performance in their professional goals
- ICT will provide more advantages for their professional life than disadvantages
- Not all of senior educators are familiar with ICT, some are still not familiar with it.
- ICT is not hard to use if they have a good advisor to guide them but it may not be enough because some are not sure that providing an advisor will help them to learn ICT or not.
- They are not afraid of using ICT
- The computer and the Internet are important in supporting their academic goals

In addition, there are positive correlations between senior educators' attitudes to the statements “Computers and the Internet now play great roles in education” “Everybody should know how to use a computer and the Internet”, “Educators should know how to use computers and the Internet”, “Using ICT helps me to gain more skills, experience, and achieve better performance in my professional goals”, and “ICT will provide more advantages for my professional life than disadvantages” (r = .739, p = .001), (r = .773, p = .001), (r = .616, p = .001), and (r = .728, p = .001) respectively.
4.3.3 Research Question 3:

"How much do they [Thai senior educators] believe ICT can help?"

This section investigates the beliefs of Thai senior educators with regard to how much ICT can help them.

To seek how much they believe ICT can help, the questions asked were classified into eight parts.

- The first and second parts focused on how much they believe ICT assists them to achieve their goals.
- The third part concerned hindrances and how much they believe these will obstruct them in using ICT to achieve their goals.
- Part four asked how strongly they believe it will encourage them to use ICT.
- Part five asked senior educators how ICT can help them if they were once familiar with it.
- Parts six and seven asked how much they believe using ICT can help and if they have an opportunity to use it, do they believe it can help them to achieve their professional goals or not.
- The final part sought their views on how ICT can benefit current education.

The results in this particular section will answer Research Question 3 "How much do they [Thai senior educators] believe ICT can help?"
4.3.3.1 Data collection from questionnaires

The beliefs of Thai senior educators how ICT can assist in the accomplishment of their professional goals

![Bar chart showing the beliefs of Thai senior educators about the assistance of ICT in accomplishing professional goals.]

Figure 4.20: How much do they [Thai senior educators] believe that ICT assists in the accomplishment of their professional goals?

<table>
<thead>
<tr>
<th>Question 2.1</th>
<th>Using ICT can save working time</th>
<th>Using ICT increases working convenience</th>
<th>Using ICT enables work to be done more efficiently</th>
<th>Using ICT increases work capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly believe</td>
<td>66.3%</td>
<td>68.8%</td>
<td>50%</td>
<td>59.4%</td>
</tr>
<tr>
<td>Believe</td>
<td>27.5%</td>
<td>25%</td>
<td>41.3%</td>
<td>31.9%</td>
</tr>
<tr>
<td>Neither believe nor not believe</td>
<td>2.5%</td>
<td>1.9%</td>
<td>4.4%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Not believe</td>
<td>0.6%</td>
<td>1.3%</td>
<td>0.6%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>96.9%</td>
<td>96.9%</td>
<td>96.3%</td>
<td>96.9%</td>
</tr>
<tr>
<td>Missing</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.20: How much do they [Thai senior educators] believe that ICT assists in the accomplishment of their professional goals?
From the feedback of Thai senior educators acquired through the questionnaire, it can be seen that their beliefs about using ICT to accomplish their goals are very positive. Figure 4.20 shows most respondents believe that using ICT can save their working time (66.3%), increase their working convenience (68.8%), enable their work to be done more efficiently (50%), and increase their work capability (59.4%). In contrast, the percentages of respondents who are uncertain are very low and only a few do not believe ICT can help them in these particular points (0.6%, 1.3%, 0.6%, and 0% respectively). None strongly do not believe, these points to be true.

The beliefs of Thai senior educators in using ICT.

Figure 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals?
The results from the six statements in this part described respondents' opinions about using ICT to achieve their professional tasks. They suggest that in most of the task activities, the majority of respondents strongly believe ICT can help to customize their own resources to support their teaching (51.3%), allow them to communicate with other people easily (51.9%), enable them to be inspired and motivated by new and innovative methods of learning (41.3%), and can improve learning and teaching (46.9%). In designing their own educational aids and to enable them follow students' progress, the majority of respondents did not strongly believe ICT can help, but they still believe ICT can help (41.9% and 31.9% respectively). In this part, there were only two task activities that the respondents said they strongly did not believe. First using ICT enables you to design your own educational aids and second, using ICT allows you to follow your students' progress (0.6% and 2.5% respectively).
How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?

![Bar chart showing the percentage of Thai senior educators who believe various statements obstruct their use of ICT.](image)

**Figure 4.22**: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?

<table>
<thead>
<tr>
<th>Question 2.3</th>
<th>Do not own / have ICT facilities or devices</th>
<th>Afraid/lack confidence to use it</th>
<th>Costly</th>
<th>Have tried but did not enjoy it</th>
<th>Have a disability that makes it difficult</th>
<th>Have no interest</th>
<th>Not enough time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly believe</td>
<td>25.6%</td>
<td>13.8%</td>
<td>13.8%</td>
<td>7.5%</td>
<td>8.8%</td>
<td>6.9%</td>
<td>5%</td>
</tr>
<tr>
<td>Believe</td>
<td>20%</td>
<td>20%</td>
<td>17.5%</td>
<td>10.6%</td>
<td>16.3%</td>
<td>10.6%</td>
<td>15%</td>
</tr>
<tr>
<td>Neither believe nor not believe</td>
<td>17.5%</td>
<td>28.8%</td>
<td>29.4%</td>
<td>31.9%</td>
<td>28.8%</td>
<td>25.6%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Not believe</td>
<td>15.6%</td>
<td>13.8%</td>
<td>22.5%</td>
<td>21.3%</td>
<td>21.9%</td>
<td>24.4%</td>
<td>19.4%</td>
</tr>
<tr>
<td>Strongly not believe</td>
<td>15%</td>
<td>18.1%</td>
<td>11.3%</td>
<td>23.8%</td>
<td>18.1%</td>
<td>26.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Total</td>
<td>93.8%</td>
<td>94.4%</td>
<td>94.4%</td>
<td>95%</td>
<td>93.8%</td>
<td>94.4%</td>
<td>93.1%</td>
</tr>
<tr>
<td>Missing</td>
<td>6.3%</td>
<td>5.6%</td>
<td>5.6%</td>
<td>5%</td>
<td>6.3%</td>
<td>5.6%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 4.22**: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?
The results in this part consisted of seven statements that concerned barriers and how much Thai senior educators believe they could be obstructed by using ICT for their professional goals. These statements are shown in Figure 4.22 and can be interpreted as follows:

First, if Thai senior educators do not have their own ICT facilities or ICT devices, it will very hard for them to use or learn how to use ICT to achieve their goals. In Figure 4.22 high percentages of respondents strongly believe that this particular statement will be a barrier for them to use it for their professional goals (25.6%).

Second, regarding fear of and lacking confidence in using ICT which can cause obstruction, 20% believed and 13.8% strongly believed in this statement. However, it was not a serious point because the majority neither believe do nor not believe (28.8%), which implies that if they are afraid/lack confidence, they can still use it.

The third statement refers to the cost of using ICT. The results in this statement are similar to the results in statement two [afraid/lack confidence to use ICT]. Most respondents are uncertain or do not use it if the cost is high.

For the fourth statement, the results showed (Figure 4.22) that the majority of respondent said that they neither believe nor do not believe. If Thai senior educators tried to use ICT but did not enjoy it, it would be a barrier for them to achieve their goals. This applies to 18% of the respondents in this study.

As in statement four, the results in statement five show that if they have a disability that makes it difficult for them to use it, most respondents still neither believe nor do not believe it will be a barrier for them to use ICT.

In statement six, most respondents do not think that if they have no interest in ICT, it will stop them using it. According to Figure 4.22, 26.9% of respondents strongly do not believe and 24.4% do not believe in this particular point.

The results in the last statement show that most respondents neither believe nor do not believe it will be an obstruction to use ICT if they do not have enough time.
According to the results from Figure 4.22, the highest percentages from the respondents chose neither believe nor not believe in this particular statement (30.6%).

From the statements in this part, it can be seen that the most important obstruction for their use of ICT is that they do not own / have ICT facilities or devices.

How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?

![Figure 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?](image)

Figure 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?
This part concerns how strongly Thai senior educators believe the statements provided would encourage them to use ICT to achieve their professional goals. The particular statements are:

1. Better learning/education facilities to help me learn ICT
2. If I had more time
3. If costs were reduced
4. If it were a more convenient way to learn ICT
5. If it would expose me to more education facilities
6. If I had someone to train me.

The results shown in Figure 4.23 can be interpreted as follows.

Most respondents strongly believe that if learning to use ICT is good or if there are good facilities, they are willing to use it to support their professional goals. The percentages of respondents who either strongly believe or believe in this issue are 53.8% and 36.3% respectively. In addition, no respondents do not believe or strongly do not believe in this point (0%).
The second statement asked about time and it can be seen that most respondents strongly believe time is another factor to encourage them to use ICT. Regarding the results in the previous part, most respondents neither believe nor not believe if they do not have enough time it will be an obstruction for them to use ICT. On the other hand, this particular result showed that if they have more time to become familiar with ICT, they said they strongly believe as this will encourage them to use it.

The third statement focused on reducing the cost of ICT. The results seem similar to the previous statement. They said they were uncertain to use or not use ICT if it were costly. However, if there is a reduction in cost, most respondents strongly believe this factor will encourage them to use it.

The fourth statement asked respondents if they were provided with a more convenient way of learning ICT, how much they strongly believe this will encourage them to use ICT. The results showed 44.4% strongly believe and 36.9% believe it can encourage them to use ICT.

Statement 5 referred to most senior educators' beliefs and strong beliefs, 41.3% and 42.5% respectively that if there is exposure to more education facilities, they will be willing to use ICT.

The last statement asked respondents if they were provided with someone to train them whether it would encourage them to use ICT or not. The results showed that most strongly believe this will encourage them to use ICT. Most respondents said they strongly believe (46.9%). In contrast, respondents who do not believe and strongly do not believe were only 4.4% and 2.5% respectively.
Once you are familiar with using ICT, do you believe it will help you to achieve your professional goals more easily?

![Pie chart showing percentage of respondents.]

Figure 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals?

<table>
<thead>
<tr>
<th>Question 2.5</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>132</td>
<td>82.5</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Not sure</td>
<td>20</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals?

The question in this part asked Thai senior educators, both familiar and unfamiliar with ICT, that if once they were familiar with it do they believe it can assist them to achieve their goals or not. The results in Figure 4.24 show that 82.5% of the respondents said they believe that once they were familiar with using ICT, it could help them to be successful in their goals. Twenty (12.5%) said they were not sure and only three said they do not believe it can assist them. From these results, it seems that if they have an opportunity to familiarize themselves with ICT, it will not be hard for them to apply this knowledge in their professional life to support their goals. How much do you believe using ICT can help you to achieve your professional goals?
How much do you believe using ICT can help you to achieve your professional goals?

![Pie chart showing the distribution of responses to Question 2.6 regarding the belief in the help of ICT for professional goals. The chart indicates that 30% believe very much, 56.9% believe much, 6.3% believe not much, and 2.5% do not know.]

Figure 4.25: How much do you believe using ICT can help you to achieve your professional goals?

<table>
<thead>
<tr>
<th>Question 2.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much</td>
<td>48</td>
<td>30</td>
</tr>
<tr>
<td>Much</td>
<td>91</td>
<td>56.9</td>
</tr>
<tr>
<td>Not much</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Do not know</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.25: How much do you believe using ICT can help you to achieve your professional goals?

As has already been mentioned, in many task activities, it can be seen that most respondents believe using ICT helps them to perform more easily but that it also presented barriers that they believe could hinder them achieve their professional goals.

The question here asked Thai senior educators “How much do you believe using ICT can help you to achieve your professional goals?” to discover their beliefs in this particular point. The results in Figure 4.25 show that most respondents believe using ICT can help them to achieve their professional goals (56.9%). The percentages of the respondents who strongly believe in the same issue were 30%. On the other hand, the
percentages of respondents who do not believe and who do not know are very low (6.3% and 2.5% respectively). The results show that the majority believe using ICT can help them achieve their goals.

If you have an opportunity to use ICT, for example, a computer, the Internet, or PowerPoint presentation programs, would you like to try these facilities?

![Pie chart showing responses](image)

Figure 4.26: How if they have an opportunity to use ICT would they like to try their facilities?

<table>
<thead>
<tr>
<th>Question 2.7</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>136</td>
<td>85</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Not sure</td>
<td>12</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.26: How if they have an opportunity to use ICT would they like to try their facilities?

Similar to the results in part five, Thai senior educators will not hesitate to try to use ICT if they have an opportunity. In Figure 4.26, 85% of the respondents said if they had an opportunity to use ICT, a computer, the Internet, or PowerPoint presentation programs, they would try. Only 7.5% were still uncertain and 4.4% said no, which is a very low percentage compared to the majority of respondents.
Do you believe that ICT benefits current educational societies?

![Pie chart showing the percentage of respondents who believe ICT benefits current educational societies.](image)

Figure 4.27: Do you believe that ICT benefits current educational societies?

<table>
<thead>
<tr>
<th>Question 2.8</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>154</td>
<td>96.3%</td>
</tr>
<tr>
<td>Not sure</td>
<td>3</td>
<td>1.9%</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>98.1%</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>1.9%</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.27: Do you believe that ICT benefits current educational societies?

The final part in this section focused on ICT benefits for current educational societies. From the overall feedback, it can be seen that in Figure 4.27 most respondents said they believe ICT provides benefits to education (96.3%) and only 3 were not sure. No one in this particular issue said they do not believe.

### 4.3.3.2 Summary

Overall, the majority of Thai senior educators believed at high levels that using ICT is helpful (beneficial both for them and society). ICT is accepted by most respondents as it can help them in activities that relate to their professional goals. They also believed if they have an opportunity to use ICT, they will try it because when they become familiar with it, they believe it will help achieve their professional goals more easily.
Furthermore, to own or to have ICT facilities or devices is very important otherwise there can be a barrier to learn how to use it. In addition, being afraid/lacking confidence to use ICT or if the cost is too high and time is limited, these factors also hinders them from using ICT. On the other hand, to encourage them to use ICT, most respondents believed that if there are better learning or education facilities for ICT, or if time spent learning to use it is appropriate and the cost is cheap, they are willing to use ICT.
4.3.4 Research Question 4: “What level of ICT do they need?”

To explore the level of senior educators’ needs of ICT in their academic life in this section is one of the purposes of this study. The results also are used to answer Research Question 4 “What level of ICT do they need?.” The methodologies used are quantitative data analyses from Likert scale questions and qualitative data from in-depth interviews.

Answers to the Likert scale questions are classified numerically into 5. The numbers of the scale in each statement of the answers are between 5-1. These indicate accurately respondents’ views (5 = strong need, 4 = need, 3 = uncertain, 2 = not needed, 1 = definitely not needed). The details and the results are illustrated as follows:

4.3.4.1 Data collection from questionnaires

Need to use ICT such as the computer and the Internet to support academic life

![Figure 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life](image)

<table>
<thead>
<tr>
<th>Question 4.1</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>4 need</td>
<td>59</td>
<td>36.9</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>16</td>
<td>10.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life
Figure 4.28 shows that 43% of respondents indicated strong need and 36.9% the need to use ICT such as the computer and the Internet to support their academic life respectively. These results indicate that most senior educators feel there is a need to use ICT or try to use it to support their work life especially when compared with the other results, such as uncertain 10%, not needed 3.8%, and definitely not needed only 0.6%.

The level of need of the benefit of using ICT to help achieve academic goals

Figure 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals

<table>
<thead>
<tr>
<th>Question 4.2</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>64</td>
<td>40.0</td>
</tr>
<tr>
<td>4 need</td>
<td>64</td>
<td>40.0</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>18</td>
<td>11.3</td>
</tr>
<tr>
<td>2 not needed</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals

The percentage of senior educators who reflect a strong need and who need to apply the benefit of using ICT to help them achieve their academic goals is 40% for each level. These results it can be interpreted that the level of needs of senior educators of the benefits of using ICT is higher than people who do not need it. Six said do not need and no one chose definitely not needed.
Nevertheless, 11.3% are uncertain and the percentage of those who do not need in this particular issue is similar to Figure 4.28. It may be these groups of people are still unsure about the benefits of ICT or what ICT functions they can use or how can they apply it to achieve their work goals.

According to an in-depth interview, one interviewee stated that he was not sure of the benefits of using ICT and how it could help his academic work as follows;

"I have never used it because I do not have many classes. When I teach, I provide documents paper and worksheets for my students and sometime use a pen to draw the structure of chemical formula on the overhead transparency. I am not sure if PowerPoint can do this thing or not?"

Therefore, providing senior educators with details of the advantages of using ICT and how it can enable them to achieve their academic goals is an important factor that should be taken into consideration.

**Desire to use ICT to help achieve professional goals**

![Desire to use ICT to help achieve professional goals](image)

Figure 4.30: The level of senior educators' desire to use ICT to help achieve their professional goals

<table>
<thead>
<tr>
<th>Question 4.3</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>68</td>
<td>42.5</td>
</tr>
<tr>
<td>4 need</td>
<td>58</td>
<td>36.3</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>17</td>
<td>10.6</td>
</tr>
<tr>
<td>2 not needed</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.30: The level of senior educators' desire to use ICT to help achieve their professional goals
Figure 4.30 shows the level of senior educators' desire to use ICT in order to help them achieve their professional goals. Most respondents indicated strong need and need to use ICT to help achieve their professional goals (42.9% and 36.3% respectively). Meanwhile, 10.6% were still uncertain selecting need or do not need.

The inter-correlation matrix between:

Question 4.2: The level of need of senior educators of the benefits of using ICT to help them achieve their academic goals.

Question 4.3: The level of senior educators' desire to use ICT to help achieve their professional goals.

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Q 4.2</th>
<th>Q 4.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q 4.2</td>
<td>1</td>
<td>.851**</td>
</tr>
<tr>
<td>Q 4.3</td>
<td>.851**</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

Table 4.30: Correlation of two variables

From the correlation coefficients shown in Table 4.30, both variables (Questions 4.2 and 4.3) have a very high positive correlation ($r = .851, p = .001$). This relates to the result in Figure 4.29 that whenever they are still not sure about the benefits or performance of using ICT to help in achieving academic goals, they feel a greater desire to use it.

Nevertheless, low percentages said they do not need to use ICT according to Figure 4.30. Senior educators who said they do not need it and definitely not needed, are very low (10.6% and 4.4% respectively).
Need own computer at home

![Bar chart showing the level of senior educators' needs of a computer at home.](image)

**Figure 4.31: The level of senior educators' needs of a computer at home**

<table>
<thead>
<tr>
<th>Question 4.4</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>62</td>
<td>38.8</td>
</tr>
<tr>
<td>4 need</td>
<td>53</td>
<td>33.1</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>24</td>
<td>15.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table 4.31: The level of senior educators’ needs of a computer at home**

The computer, one of most powerful pieces of equipment in ICT, is very popular everywhere both at the work place or at home. However, educators who have been using it at their institutes can never use it at home because they do not possess their own computer. Figure 4.31 shows the percentage of senior educators who need a computer at home. The percentages showing strong need and need for their own computer at home are 38.8% and 33.1% respectively. Those who are uncertain totalled 15%. On the other hand, only 6.9% said they do not need a computer at home and no one said they definitely did not need one.
The Internet plays a great role in education and lecturers, teachers and researchers use it for their academic goals, for example, searching for information to prepare lessons or do research. It is now common place in institutes and it is very convenient to use at the workplace. However, Internet access from home can provide more opportunities and is convenient for people who use it at their institutes or have never used it before.

In addition, it may also be of extra importance for senior educators because some are part-time who spend a lot of time on preparation at home rather than at the institute. This question explored the level of senior educators’ needs to access the Internet from home and shows in Figure 4.32 that most of them report strong need and need to access the Internet from home (38.8% and 34.4% respectively). There is a percentage, 13.8%, who are still uncertain, but only 6.9% said do not need it.

Finally, no one said they definitely do not need to access the Internet from home (0%).
Need to keep work and paper documents in hard disk or CD ROM

![Bar chart showing levels of need for keeping documents in hard disk or CD Rom]

Figure 4.33: The level of senior educators’ needs to keep their work and paper documents in their Hard disk or CD Rom

<table>
<thead>
<tr>
<th>Question 4.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>74</td>
<td>46.3</td>
</tr>
<tr>
<td>4 need</td>
<td>53</td>
<td>33.1</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>2 not needed</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.33: The level of senior educators’ needs to keep their work and paper documents in their Hard disk or CD Rom

It is common practice now to store data in a hard disk or on a CD Rom. The hard disk drives at present provide huge capacities and are smaller than in the past. There are many new types available for users, for example, the USB thumb drive, or Moveable Hard disc. DVD disks are also now very popular for keeping recorded data. As the capacity of a DVD disc is much larger than a normal CD Rom, it is not surprising that most senior educators choose to keep their work and paper documents in these kinds of storage tools. Figure 4.33 shows 46.3% of senior educators voice a strong need and 33.1% needed to use these ICT tools to help them in their academic life. Only 5.6% and 0.6% do not need and definitely do not need them respectively.
Need to use email to communicate with colleagues and pupils

![Bar chart showing the levels of need for senior educators to use email to communicate with colleagues and pupils. The chart is divided into two questions: Question 4.7 (Communicate with colleagues) and Question 4.8 (Communicate with pupils). The chart indicates that most educators feel a strong need to use email to communicate with colleagues, with frequencies of 45 (28.1%) and 37 (23.1%) respectively. The need for email communication with pupils is also high, with frequencies of 61 (38.1%) and 49 (30.6%) respectively.](image)

Figure 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

<table>
<thead>
<tr>
<th>Question 4.7</th>
<th>Question 4.8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communicate with colleagues</strong></td>
<td><strong>Communicate with pupils</strong></td>
</tr>
<tr>
<td>The level of needs</td>
<td>Frequency</td>
</tr>
<tr>
<td>5 strongly need</td>
<td>45</td>
</tr>
<tr>
<td>4 need</td>
<td>61</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>30</td>
</tr>
<tr>
<td>2 not needed</td>
<td>10</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
</tr>
</tbody>
</table>

Table 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

Figure 4.34 shows the levels of Thai senior educators' needs to use email to communicate with colleagues and students. Most like to use email to communicate with colleagues, those who feel a strong need and need being 23.1% and 30.6% respectively. Regarding using email to communicate with students, 28.1% said there was a strong need and 38.1% indicated need. If the graphs of those who need to use email to communicate between colleagues and pupils is compared, the percentage of the need to contact colleagues is higher than pupils.
Need to prepare lessons by PowerPoint program

Figure 4.35: The level of senior educators’ needs to prepare lessons by PowerPoint

<table>
<thead>
<tr>
<th>Question 4.9</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly need</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>4 need</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>24</td>
<td>15.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>93.1</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.35: The level of senior educators’ needs to prepare lessons by PowerPoint

Senior educators need to use ICT software such as PowerPoint to support their academic work. Figure 4.35 shows PowerPoint is needed to prepare lessons at the same level between strong need and need (35%) because PowerPoint is very popular software that can be used to support academic goals. The results from Question 4.2 show some people still do not know the benefits of this program, 15% are, therefore, still uncertain. However, it was found only 6.3% do not need and 3 respondents indicated they definitely did not need it respectively which is a very low percentage.
Need ICT to support me to achieve academic goals

Figure 4.36: The level of senior educators’ needs of ICT to support them in achieving their academic goals

<table>
<thead>
<tr>
<th>Question 4.10</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly need</td>
<td>63</td>
<td>39.4</td>
</tr>
<tr>
<td>4 need</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>16</td>
<td>10.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.36: The level of senior educators’ needs of ICT to support them in achieving their academic goals

The last question in this section of the questionnaire asked them what level of ICT they needed to support them to achieve their academic goals. Most indicated strong need and need, 39.4% and 41.3% respectively. This means ICT is necessary to help achieve academic goals. In contrast, only 1 person definitely recorded not needed.
4.4.2 Summary

The results in this section answer Research Question 4 and showed that most senior educators need ICT. From the results in every question, overall senior educators’ needs of ICT in their academic life are at a very high level. The percentages of senior educators who do not need and who definitely do not need ICT are very low. Some are still uncertain about need or do not need ICT because of factors such as they do not have enough information about the variety of benefits to be obtained from using ICT to help them achieve academic goals or they have no previous experience with ICT. However, these groups of people may state a need to use ICT in the future if they are provided with more information about the various kinds available.

4.5 Research Question 5: “How can ICT help them to be successful?”

The results in this section answer Research Question 5 “How can ICT help them to be successful [professional goals]”. In this section, there are two parts, task activities involving the use of ICT and using a computer to support senior educators’ professional goals.
4.3.5.1 Data collection from questionnaires

First, the respondents were asked how suitable the following tasks were in assisting them to achieve their professional goals. The results are shown in Figure 4.37 below.

Figure 4.37: A comparison of task activities of senior educators in supporting their professional goals
<table>
<thead>
<tr>
<th>Task</th>
<th>5 Very suitable</th>
<th>4 Suitable</th>
<th>3 Neutral</th>
<th>2 Unsuitable</th>
<th>1 Definitely unsuitable</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>67</td>
<td>41.9</td>
<td>52</td>
<td>32.5</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>Searching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on weblogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2</td>
<td>71</td>
<td>44.4</td>
<td>48</td>
<td>30</td>
<td>22</td>
<td>14.4</td>
</tr>
<tr>
<td>Using a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>search</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>engine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to seek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 3</td>
<td>20</td>
<td>12.5</td>
<td>30</td>
<td>18.8</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Creating a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>webpage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 4</td>
<td>38</td>
<td>23.8</td>
<td>47</td>
<td>29.4</td>
<td>45</td>
<td>21.1</td>
</tr>
<tr>
<td>Transferring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>photos or</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>data to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>persons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 5</td>
<td>56</td>
<td>35</td>
<td>46</td>
<td>28.8</td>
<td>27</td>
<td>16.9</td>
</tr>
<tr>
<td>Checking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>email</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 6</td>
<td>31</td>
<td>19.4</td>
<td>56</td>
<td>35</td>
<td>41</td>
<td>25.6</td>
</tr>
<tr>
<td>Checking a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 7</td>
<td>54</td>
<td>33.8</td>
<td>62</td>
<td>38.8</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>Making</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>educational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arrangements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 8</td>
<td>76</td>
<td>47.5</td>
<td>54</td>
<td>33.8</td>
<td>14</td>
<td>8.8</td>
</tr>
<tr>
<td>Need more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 9</td>
<td>17</td>
<td>10.6</td>
<td>35</td>
<td>21.9</td>
<td>62</td>
<td>39.4</td>
</tr>
<tr>
<td>Posting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>messages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on the</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>webpage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 10</td>
<td>9</td>
<td>5.6</td>
<td>19</td>
<td>11.9</td>
<td>52</td>
<td>32.5</td>
</tr>
<tr>
<td>Buying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>something</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>via</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-commerce</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 11</td>
<td>21</td>
<td>13.1</td>
<td>37</td>
<td>23.1</td>
<td>48</td>
<td>30</td>
</tr>
<tr>
<td>Receiving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 12</td>
<td>20</td>
<td>12.5</td>
<td>42</td>
<td>26.3</td>
<td>41</td>
<td>25.6</td>
</tr>
<tr>
<td>Using VDO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>streaming,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>watching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>movies or</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>news</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 13</td>
<td>17</td>
<td>10.6</td>
<td>50</td>
<td>31.3</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>Discussing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or chatting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>persons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.37: A comparison of task activities of senior educators in supporting their professional goals
From the results in Table 4.37, it can be seen that 4 activities (Tasks 1, 2, 5, and 8) with high percentages that respondents consider are very suitable to support them in their professional goals.

Task 1 is searching for information on websites. Table 4.37 shows 41.9% of the senior educators consider searching websites a very suitable activity. Whilst, 32.5% of respondents think it suitable. This indicates that Thai senior educators believe this task can support them to attain in their professional goals.

Task 2 is using a search engine to seek information. A search engine is a tool that can help senior educators in their professional goals. Table 4.37 shows 44.4% of respondents think using it to seek information is a very suitable ICT activity. Another group, 30% think this task is suitable. The percentage of respondents who are uncertain considering it as neither suitable nor unsuitable is 14.4%. However, the overview of the feedback in this section is that the majority of participants (74.4%) believed using a search engine to seek information is a very suitable task activity for senior educators searching information on the World Wide Web and that this task can help support their goals.

Using email, senior educators can easily communicate with other persons for instance, pupils, colleagues, and administrators. In Task 5 which is checking e-mail, there are strong positive results in answer to the research question that using email is an activity that can help senior educators achieve their goals. Most senior educators chose checking e-mail as either a very suitable task (35%) or a suitable task (28.8%) for them to be successful in their goals.

Senior educators think that Task 8, regarding needing more direction on using ICT to search for information, is suitable. Figure 4.44 shows the overview of respondents who consider this particular task is either very suitable or suitable (47.5% and 33.8% respectively). The percentage of respondents who think this particular task is unsuitable is 1.9%.

The results for these particular task activities show only a few respondents think Task 1, 2, 5, and 8 are definitely unsuitable with 2, 1, 6, and zero respectively.

Tasks 4, 6, 7, 12, and 13 are activities considered suitable for their professional goals. The results show a high percentage of respondents think Task 4: transferring a
photo or data to others by using ICT is suitable (29.4%), Task 6: Checking time schedules revealed 39% of respondents support this item. In addition, Task 7: Making educational arrangements, Task 12: Using VDO streaming, Watching movies or news, and Task 13: Discussing or chatting with other persons, are also suitable task activities according to the high percentages of these particular activities (38.8%, 26.8% and 31.3% respectively). Even though, the percentages of respondents who chose “very suitable” in these particular tasks are less than “suitable”, but in combining the very suitable and suitable scores, the overview of suitability of these tasks is suitable. As a result, Tasks 4, 6, 7, 12, and 13 are suitable activities for senior educators.

A high percentage of respondents think some tasks may be neutral for supporting their professional goals, for example Task 3: creating a webpage (36.9%), Task 9: Posting messages on the web board (39.4%), Task 10: Buying something via e-commerce (32.5%) Task 11: and Registering information (30%).

Regarding the results in this part, there is no task activity that the majority of respondents think is unsuitable and definitely unsuitable, but there is interesting data from Task 10: buying something via e-commerce because 23.1% and 18.8% of respondents think this task activity is unsuitable and definitely unsuitable. This will be discussed in the next chapter. The missing data in this section which involves respondents who did not select any answers, usually lower than 10%, will be discussed in the next chapter.
The second part asked senior educators how suitable it is for them to use a computer for professional tasks (Tasks 1-12) to support their goals. The results are as follows:

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Perce ntual Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>Keep records such as grades and attendance</td>
<td>24.4% in Very suitable, 36% in Suitable</td>
</tr>
<tr>
<td>Task 2</td>
<td>Word processing of test, handouts, other materials</td>
<td>37.5% in Very suitable, 31.3% in Suitable</td>
</tr>
<tr>
<td>Task 3</td>
<td>Prepare lesson plans</td>
<td>38.8% in Very suitable, 36% in Suitable</td>
</tr>
<tr>
<td>Task 4</td>
<td>Present lessons</td>
<td>33.8% in Very suitable, 31.3% in Suitable</td>
</tr>
<tr>
<td>Task 5</td>
<td>Facilitate project-based learning</td>
<td>33.1% in Very suitable, 31.3% in Suitable</td>
</tr>
<tr>
<td>Task 6</td>
<td>Communicate with students and parents</td>
<td>36.9% in Very suitable, 33.8% in Suitable</td>
</tr>
<tr>
<td>Task 7</td>
<td>Communicate with your colleagues</td>
<td>35.9% in Very suitable, 34.4% in Suitable</td>
</tr>
<tr>
<td>Task 8</td>
<td>Communicate with administrators</td>
<td>31.3% in Very suitable, 29.4% in Suitable</td>
</tr>
<tr>
<td>Task 9</td>
<td>Participate in online professional development</td>
<td>34.4% in Very suitable, 26.9% in Suitable</td>
</tr>
<tr>
<td>Task 10</td>
<td>Search information for your students</td>
<td>31.9% in Very suitable, 24.4% in Suitable</td>
</tr>
<tr>
<td>Task 11</td>
<td>Conduct student assessments</td>
<td>36.3% in Very suitable, 29.4% in Suitable</td>
</tr>
<tr>
<td>Task 12</td>
<td>Seek peer-to-peer advice and counseling</td>
<td>28.9% in Very suitable, 20% in Suitable</td>
</tr>
</tbody>
</table>

Figure 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals
<table>
<thead>
<tr>
<th>Task</th>
<th>Very suitable N</th>
<th>Very suitable %</th>
<th>Suitable N</th>
<th>Suitable %</th>
<th>Neutral N</th>
<th>Neutral %</th>
<th>Unsuitable N</th>
<th>Unsuitable %</th>
<th>Definitely unsuitable N</th>
<th>Definitely unsuitable %</th>
<th>Missing N</th>
<th>Missing %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>Keep records such as grades and attendance</td>
<td>39</td>
<td>24.4</td>
<td>56</td>
<td>35</td>
<td>31</td>
<td>19.4</td>
<td>7</td>
<td>4.4</td>
<td>10</td>
<td>6.3</td>
<td>17</td>
</tr>
<tr>
<td>Task 2</td>
<td>Word processing of test, handouts, other materials</td>
<td>60</td>
<td>37.5</td>
<td>53</td>
<td>33</td>
<td>20</td>
<td>12.5</td>
<td>6</td>
<td>3.8</td>
<td>5</td>
<td>3.1</td>
<td>16</td>
</tr>
<tr>
<td>Task 3</td>
<td>Prepare lesson plans</td>
<td>56</td>
<td>35</td>
<td>66</td>
<td>41.3</td>
<td>13</td>
<td>8.1</td>
<td>6</td>
<td>3.8</td>
<td>4</td>
<td>2.5</td>
<td>15</td>
</tr>
<tr>
<td>Task 4</td>
<td>Present lessons</td>
<td>62</td>
<td>38.8</td>
<td>56</td>
<td>35</td>
<td>16</td>
<td>10</td>
<td>6</td>
<td>3.8</td>
<td>3</td>
<td>1.9</td>
<td>17</td>
</tr>
<tr>
<td>Task 5</td>
<td>Facilitate project-based learning</td>
<td>50</td>
<td>31.3</td>
<td>54</td>
<td>33.8</td>
<td>32</td>
<td>20</td>
<td>4</td>
<td>2.5</td>
<td>3</td>
<td>1.9</td>
<td>17</td>
</tr>
<tr>
<td>Task 6</td>
<td>Communicate with students and parents</td>
<td>27</td>
<td>16.9</td>
<td>39</td>
<td>24.4</td>
<td>53</td>
<td>33.1</td>
<td>16</td>
<td>10</td>
<td>9</td>
<td>5.6</td>
<td>16</td>
</tr>
<tr>
<td>Task 7</td>
<td>Communicate with your colleagues</td>
<td>34</td>
<td>22.5</td>
<td>59</td>
<td>36.9</td>
<td>30</td>
<td>18.8</td>
<td>13</td>
<td>8.1</td>
<td>8</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Task 8</td>
<td>Communicate with administrators</td>
<td>24</td>
<td>15</td>
<td>44</td>
<td>27.5</td>
<td>50</td>
<td>31.3</td>
<td>13</td>
<td>8.1</td>
<td>13</td>
<td>8.1</td>
<td>16</td>
</tr>
<tr>
<td>Task 9</td>
<td>Participate in online professional development</td>
<td>34</td>
<td>21.3</td>
<td>55</td>
<td>34.4</td>
<td>43</td>
<td>26.9</td>
<td>5</td>
<td>3.1</td>
<td>7</td>
<td>4.4</td>
<td>16</td>
</tr>
<tr>
<td>Task 10</td>
<td>Search information for your students</td>
<td>51</td>
<td>31.9</td>
<td>64</td>
<td>40</td>
<td>20</td>
<td>12.5</td>
<td>7</td>
<td>4.4</td>
<td>3</td>
<td>1.9</td>
<td>15</td>
</tr>
<tr>
<td>Task 11</td>
<td>Conduct student assessments</td>
<td>30</td>
<td>18.8</td>
<td>58</td>
<td>36.3</td>
<td>40</td>
<td>25</td>
<td>9</td>
<td>5.6</td>
<td>7</td>
<td>4.4</td>
<td>16</td>
</tr>
<tr>
<td>Task 12</td>
<td>Seek peer-to-peer advice and counseling</td>
<td>24</td>
<td>15</td>
<td>47</td>
<td>29.4</td>
<td>43</td>
<td>26.9</td>
<td>19</td>
<td>11.9</td>
<td>12</td>
<td>7.5</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals
From the results in Table 4.38, using a computer in Tasks 2 and 4 is considered a very suitable activity for Thai senior educators as indicated by the high percentages. The results are interpreted as follows.

For Task 2, the word processing of tests, handouts and other materials, the respondents think it very suitable to use a computer to perform these jobs. In this particular group, 37.5% believed it to be very suitable and a further, 33.1% agreed that it is suitable. On the other hand, there are low percentages for respondents who think it is unsuitable and definitely unsuitable (3.8% and 3.1% respectively).

Task 4 concerns presenting lessons by using a computer. The results show most respondents agreed that using a computer is very suitable in presenting lessons, 38.8%. 35% also think the activity is suitable. Very low percentages of respondents think it is unsuitable and definitely unsuitable 3.8% and 19% respectively. The percentages of respondents who are still uncertain about this particular task is also low, at 10%.

Although the highest agreement about suitability was given to Tasks 2 and 4, strong percentages from respondents in Tasks 1, 3, 5, 7, 9, 10, 11, and 12 also revealed that these tasks are “suitable” to support their goals as well.

Task 1 asked respondents how suitable it was for them to use a computer for keeping records or storing information and the results show they believe it is suitable. Figure 4.50 shows 39% and 24% of the respondents agree using a computer to do this task is very suitable and suitable respectively. In contrast, the percentages of respondents who think it is unsuitable and definitely unsuitable are low (4.4% and 6.3% respectively).

For Task 3, preparing lesson plans, the results show senior educators agree that using a computer is a suitable activity that can help achieve their goals. Figure 4.52 shows the majority of respondents feel that using a computer to do this task is suitable (41.3%). In addition, 35% think a computer is a very suitable for this particular as well. Only 6 and 4 participants think it is unsuitable and definitely unsuitable respectively.

Task 5 indicated opinions about using a computer to facilitate a project-based learning activity. The results show 33.8% of senior educators agreed that it is suitable to use a computer to support project-based learning and 31.3% think it very suitable. Both percentages of suitable and very suitable scores are high, on the other hand, the percentages of the respondents who have contrasting views on this topic are very
low, 2.5% unsuitable and 1.9% definitely unsuitable. Therefore, it can be said that the use of a computer to facilitate a project-based learning activity is a suitable activity to support Thai senior educators' professional goals.

Task 7 concerns communicating with colleagues. It seems senior educators are likely to use a computer for the results in Figure 4.56 show that 59.4% believe it enhances communication between colleagues, (22.5% very suitable, 36.9% suitable). In addition, the percentage of senior educators who think it is unsuitable and definitely unsuitable are very low (8.1% and 5% respectively). According to the high percentages of very suitable and suitable scores, it can be interpreted that this activity is suitable for them as well.

Task 9 shows most respondents think using a computer for participation in online professional development is a suitable activity (34.4%) and the percentages of the respondents who think this task is very suitable is 23.1%. Only 3.1% think it unsuitable and 4.4% think it definitely unsuitable. Some respondents, 26.9%, are not sure if this activity will be suitable or unsuitable. However, the general overview of respondents is they think particular task is suitable.

Task 10 asks about using a computer to search for information for students. It is common today to see lecturers using a computer to search for information for their pupils. Senior educators think this particular activity is either suitable or very suitable for them (40% and 31.9% respectively). Only 3 people thought it definitely unsuitable.

With reference to using a computer to assess a student's studies, respondents thought it suitable. Task 11 shows the majority of senior educators feel that a computer is suitable for conducting student assessments (36.3%), 18.8% think this task is very suitable but some respondents are still uncertain about this particular issue whether suitable or unsuitable (25%). However, in comparing the percentages between suitable and unsuitable, it can be seen that most respondents still believe that this activity is suitable to support their goals.

Task 12 refers to using a computer to seek peer-to-peer advice and for counselling. Table 1.38 shows most respondents think it is suitable to use a computer for seeking peer-to-peer advice and for counselling (29.4%) and some think it is very suitable (1.5%). However, this particular percentage is not very different to the
percentages of neither suitable nor unsuitable (26.9%). The results from this section seem suitable but not very suitable.

Nevertheless, the percentages of respondents who think using a computer may neither be suitable nor unsuitable are very high in Tasks 6 and 8 which included using a computer to communicate with students and parents of the student, and using a computer to communicate with administrators, 33.1% and 31.3% respectively. The percentages of respondents who think it is unsuitable and definitely unsuitable for all tasks are presented in Table 4.38 (Tasks 1 – 12). These results will be discussed in the next chapter.

4.3.5.2 Summary

The results in this section showed ICT can help Thai senior educators in many suitable tasks and activities to accomplish their professional goals. The particular activities that most respondents think are very suitable are searching for information on websites, using a search engine to seek information, and needing more direction. In addition, using a computer can help them in their many professional tasks too. To use one to support their activities, most respondents agreed using Word processing to manage and organize tests, handouts, prepare materials and using Presentations in lessons are very suitable, while most respondents think they are only suitable, neither nor unsuitable, or unsuitable, and definitely unsuitable.
4.3.6 Research Question 6: "What appropriate ICT do they need to succeed?"

Because of the rapid development of ICT today, there are many devices and software applications that are assisting educators in their academic activities. Each type of ICT has various benefits and functions in support of their goals. However, for some senior educators not familiar with the new technology, not every type will be suitable because they think some may be difficult to use and may be they do not often have much chance to use them. Therefore, considering what ICT to use, how often to use it and how much they believe a particular ICT can assist in the accomplishment of their professional goals, is important. These factors will help them understand what ICT may be suitable for them.

This section presents correlations between what ICT senior educators use very often and how much they believe it will help them to achieve their goals in order to answer the Research Question 6 "What appropriate ICT do they [senior educators] need to succeed". The appropriate ICT in these areas has been classified into, first the ICT devices and second software tools.
### Data correlation

#### Thai senior educators' beliefs in how a particular ICT can assist in the accomplishment of their professional goals

<table>
<thead>
<tr>
<th>Frequency of use of ICT devices</th>
<th>Pearson Correlation, Slg. (2-tailed)</th>
<th>N=160</th>
</tr>
</thead>
<tbody>
<tr>
<td>A desktop computer</td>
<td>.330**</td>
<td></td>
</tr>
<tr>
<td>A laptop computer</td>
<td>.191*</td>
<td></td>
</tr>
<tr>
<td>A cell phone</td>
<td>.499***</td>
<td></td>
</tr>
<tr>
<td>APDA (Personal Digital Assistant)</td>
<td>.133</td>
<td></td>
</tr>
<tr>
<td>A scanner</td>
<td>.303***</td>
<td></td>
</tr>
<tr>
<td>A printer</td>
<td>.346***</td>
<td></td>
</tr>
<tr>
<td>A projector</td>
<td>.201*</td>
<td></td>
</tr>
<tr>
<td>A digital camera</td>
<td>.268**</td>
<td></td>
</tr>
<tr>
<td>A CD burner</td>
<td>.290*</td>
<td></td>
</tr>
<tr>
<td>A TV, VCD or DVD Player</td>
<td>.227**</td>
<td></td>
</tr>
<tr>
<td>A web camera</td>
<td>.181*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of use of Software tools</th>
<th>Pearson Correlation, Slg. (2-tailed)</th>
<th>N=160</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI (Computer Aided Instruction)</td>
<td>.289**</td>
<td></td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>.318***</td>
<td></td>
</tr>
<tr>
<td>Word processor</td>
<td>.345***</td>
<td></td>
</tr>
<tr>
<td>Software presentation</td>
<td>.337***</td>
<td></td>
</tr>
<tr>
<td>Graphics and multimedia</td>
<td>.270*</td>
<td></td>
</tr>
<tr>
<td>World Wide Web browsers</td>
<td>.174*</td>
<td></td>
</tr>
<tr>
<td>Calculation programs</td>
<td>.193*</td>
<td></td>
</tr>
<tr>
<td>Search engines</td>
<td>.286*</td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 (p) level (2-tailed).
** Correlation is significant at the 0.01 (p) level (2-tailed).
*** Correlation is significant at the 0.001 (p) level (2-tailed).

Table 4.3.1 Correlation matrix of Thai senior educators' beliefs in how a particular type of ICT can assist in the accomplishment of their professional goals and how much they use ICT.

The results in Table 4.39 show the correlation matrix between Thai senior educators in this study who believe ICT can assist them to achieve their professional goals and how often they use it. In this particular table, ICT is divided into two parts: ICT devices and Software tools.

#### ICT devices

From the correlation coefficients shown in Table 4.39, the ICT devices that have strong correlations between Thai senior educators' use of particular ICT and their belief that this particular item can assist in the accomplishment of their professional goals are: a cell phone ($r = 0.489, \ p = 0.001$), a printer ($r = 0.346, \ p = 0.001$), a desktop computer ($r = 0.330, \ p = 0.001$), and a scanner ($r = 0.303, \ p = 0.001$) respectively. These results indicate...
that Thai senior educators believe these particular devices that they use very often can help to achieve their professional goals at a high level.

In addition, it can be seen that other devices, where there is a correlation in this particular issue at medium level, are a digital camera \( r = 0.268, p = 0.1 \) and a TV, VCD or DVD player \( r = 0.227, p = 0.1 \). On the other hand, Laptops, Projectors, CD burners, and Web cameras have a very low correlation \( p = 0.5 \). The ICT device that has no correlation is PDA \( r = 0.133 \).

Software tools

The strongest correlation between software tools often used by Thai senior educators and their beliefs that these particular tools can assist in the accomplishment of their professional goals are a Word processor \( r = 0.345, p = 0.001 \), Software presentation \( r = 0.337, p = 0.001 \) and Spreadsheets \( r = 0.318, p = 0.001 \) respectively.

CAI, Search engines, and Graphics and multimedia programs show correlations at a medium level \( r = 0.289, p = 0.01 \), \( r = 0.286, p = 0.01 \), and \( r = 0.270, p = 0.01 \) respectively. Low correlation coefficients for software tools are Calculations programs \( r = 0.193, p = 0.01 \) and World Wide Web browsers \( r = 0.174, p = 0.01 \).

4.3.6.1 Summary

In summary, from the strong correlations of ICT often used by Thai senior educators and their beliefs that these particular tools can assist in the accomplishment of their professional goals, it can be concluded that a cell phone is the most appropriate ICT device, being used widely not only in Thailand but everywhere in today's societies. In addition, a printer, a desktop computer, and a scanner also are considered suitable devices. The most suitable software tools appropriate for Thai senior educators are a word processor, software presentations and spreadsheets respectively. On the other hand, Table 4.39 shows, some ICT devices and software tools that are not considered to be suitable for them are a PDA or calculation programs.

Finally, it can be interpreted that familiarity with ICT tools increases the chances of their being considered useful for goal achievement. This means whenever Thai senior educators have become familiar with or have been using ICT tools themselves, they realize the benefits and apply these tools in supporting their professional goals over those who have never used ICT.
The second major questions

4.3.7 Research Question 7:

"What do they [Thai senior educators] believe will be the best way for them to learn ICT?"

The choice of a suitable method for senior educators to learn how to use ICT is very important. Which method would be the best for them is the aim of this research question and they were asked, "What do you believe will be the best way for you to learn ICT?" The answers to this particular question are listed below.

4.3.7.1 The best method for Thai senior educators to learn how to use ICT

To obtain quantitative data, 160 respondents were asked in the questionnaire which of the five scenarios best describes methods they could use to learn how to use appropriate ICT and why they chose this method.

Scenario 1 Workshop by a lecturer in front of the class
Scenario 2 Workshop by peer to peertraining in groups with one peer and one trainer in each group
Scenario 3 Workshop in small group training with one mentor in each group
Scenario 4 Self learning by using E-learning or with CAI
Scenario 5 Learning from an instructional book
From the above methods, respondents selected the one that they believe it would be the best way for them to learn ICT and the details of which are shown in Figure 4.62.

![Pie chart showing percentages of scenario methods selected by respondents](image)

Figure 4.39: The percentages of scenario methods that were selected by the respondents.

<table>
<thead>
<tr>
<th>Question 6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1 Workshop with lecturer</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Scenario 2</strong></td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>Workshop by peer to peer training in groups with one peer and one trainer in each group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario 3 Workshop in small group training with one mentor in each group</td>
<td>58</td>
<td>36.3</td>
</tr>
<tr>
<td>Scenario 4 Self learning by using E-learning or with CAI</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>Scenario 5 Learning from an instructional book</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>89.4</td>
</tr>
<tr>
<td>Missing</td>
<td>17</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.39: The percentages of scenario methods that were selected by the respondents.
Figure 4.39b shows that, Scenario 3, the workshop in small group training with one mentor in each group (36.3%) was the most popular choice. The reasons they believed this particular method would be best are as follows:

1. It is small group training therefore people can be selected in each group depending on the difficulty of the lessons or the level of learners in the groups.
2. They feel this particular method is not boring because they have friends with whom they can confer not only the lecturer or the tutor.
3. This method is cheaper than Scenario 2
4. Members in small groups can exchange ideas, knowledge, and analyse problems between themselves in a short time because the number of people in each is small.
5. Learning in small groups enables them to feel less shy and nervous.
6. The tutors can monitor learners easily.

Respondents who chose Scenario 2, the workshop by peer to peer training in groups with one peer and one trainer in each group accounted for 28.1% because they believed:

1. They have a "buddy" of the same age learning together and they can also discuss or share ideas with their friends in case of doubt.
2. There is more opportunity to practise than learning in a big class.
3. The tutor and learners are closer than in a big workshop.
4. Some expressed that belief that this method would be better than the methods they had tried before.
The percentages of respondents who chose Scenario 4, Self-learning by using E-learning or with CAI, and Scenario 5, Learning from an instructional book, are 13.1% and 9.4% respectively.

Senior educators who selected Scenario 4 expressed their views as follows:

1. They can manage and organize their time to learn ICT, meaning they can learn whenever they wish.
2. It is a convenient method and saves travelling time.
3. No matter the skills and speed of learners by using this method they can learn by themselves so do not need to worry about any inability to follow other people or that they will disturb other learners.
4. They think this method is better than Method 5 but do not say why.

The percentage of respondents who selected Scenario 5 is slightly lower than Scenario 4. Participants stated that:

1. This method is very familiar and it is the basic method in learning for everyone.
2. People can learn anytime they are free and it is convenient in everyday life.
3. It is a learning method for people who want to have basic knowledge before going to the workshop class.

The least popular scenario was a workshop by a lecturer in front of the class (4 respondents, 2.5%). They made the following comments:

1. This is intensive course learning because the number of learners is greater than in the other methods as they are learning together at the same time.
2. Everyone can ask the lecturer
3. Learners have to concentrate a great deal to understand clearly.
The supplemental question asked "What other methods would you like to use to learn about ICT?" The respondents' comments have been summarized as follows:

1. They suggested that some time people like to learn by asking directly from the experts in ICT.
2. They sometimes ask their children at home.
3. They can learn by themselves from public media such as the TV or the Newspaper.
4. If it is computer software, they can try to learn from help functions in each program.
5. They would like to have an individual tutor.
6. They may choose the long distance learning method using satellite technology.

Moreover, respondents gave additional suggestions about this particular issue stating:

1. There should be a club for senior people who can exchange knowledge and information and communication technology.
2. Instruction should be continuous and there should an evaluation of the results after the training finishes.
3. There should be demonstrations of the new ICT programs or ICT hardware via the public media and to allow senior educators to try it too.
4. The textbook should be brief and easy to understand.

4.3.7.2 In-depth Interviews

In-depth interviews were conducted to obtain a greater depth of information to explore respondents' answers to this particular issue. They used semi-structured forms where the questions were flexible according to reactions, and conscious reasons for actions or feelings from the interviewees. This allows the researcher to receive a great deal of extra useful information to cover the aim of the research question.
Interviewees were asked about several points that related to the particular issue: "What do you believe will be the best way for you to learn ICT". The information was classified under 4 headings:

1. Learning ICT
2. Difficulties in learning ICT
3. Appropriate ways to learn ICT
4. Other suggestions

4.3.7.3 Learning ICT

There were varied opinions on how interviewees learned to use ICT.

For example, one senior female (Interviewee A), responded to questions related to training as below:

- At first how did you learn to use ICT?
  "At my university I had training courses but I still do not have good skills".

- What kind of training course did you attend?
  "Workshop training"

- How many people were there in the class?
  "It was quite a large workshop There was one expert in front of the class and other mentors helped".
- It seems you are familiar with ICT. May I ask, how you learnt it?

  "I attended training courses at my university. The technology just came when we were getting old and about to retire. If we still have to work, why we not learn how to use it? We have to concentrate. I think 90% of the staff in my university need to know how to use it."

  (Interviewee B, a female senior university lecturer)

  - How are people trained?

  "Sometimes they invite other lecturers from outside even though we already have our own computer lecturers. There are about 30-40 persons in one class, but numerous mentors to help us. The training courses have many levels, beginning from the basic level which has lots of students who have no skills or cannot operate the computer in the class to advanced levels where the classes are smaller. In the beginning classes may be large."

  (Interviewee B, a female senior university lecturer)

  - Normally, older people of a similar age as you, are not much interested in technology but you are different. Did you learn it by yourself or did you learn from somewhere?

  "I was trained. I also like to seek new information and knowledge from the Internet rather than go to a library."

  (Interviewee C, a male Assistant professor)

  - Where did you learn to use ICT?

  "Actually, there were courses but my free time did not allow me to attend very much. I was trained once or twice but some I didn’t use. For example, I learnt Excel but I didn’t use it. PowerPoint I have used a little bit. The courses were short about half a day for 2-3 days. After that I learned by myself. I have text books but never use them. I learn by trial and error. Even though I want to learn, I could not follow them because there was only 1 lecturer in the class and it was inconvenient to ask. If I ask friends in class, it may not be a good thing because it will disturb their time. Therefore, it seems I did not really learn. Excel I cannot use but PowerPoint I know a little."

  (Interviewee D, a female Assistant professor)

  - What kind of training course did you attend?
"It was a large group about 30 people and we had to learn at the same time. The lecturer taught and used PowerPoint but I did not have the basic skills".

(Interviewee D, a female Assistant professor)

- Was there any mentor?

"There was one mentor".

(Interviewee D, a female Assistant professor)

- That means you mainly learned by yourself and you asked when you had a problem.

"I ask someone to tell me the steps and then I practise at that time. I am not like young people who can learn in the normal way very quickly".

(Interviewee E, a male Assistant professor)

- Have you used PowerPoint since before retiring and after retiring?

"Yes, I can use it tolerably well. Usually, when I begin learning, I will take some short notes how to do it step by step. After that I will practise by myself. I sometimes search for interesting information from the Internet, then I will record it. This information is so useful for my teaching. Another important thing is I have to use or practise it everyday. Fortunately, when I was about to retire, there was a computer on my table at my office. I wanted to try it but I didn't know how to turn it on, so I just asked other people how to turn on and off. After that, I have practised regularly and took short notes. After that, I learnt how to use functions. Now I can use it and I also use email to contact my colleagues. It is so useful for me".

(Interviewee E, a male Assistant professor)

From the respondents' answers, it can be seen that the common ways senior educators learnt were training courses with a lecturer in front of the class or tutors around the workshops. Workshops usually dealt with a large number of learners. The other ways they used to learn were learning by themselves and asking other people.
4.3.7.4 Difficulties in learning ICT

The interviews revealed that many experienced difficulties in learning how to use ICT. First, they suffered problems about the facilities available to learn and to practise. Second, the ICT basic skills of each person are still not good. Third, they also suffered because the number of people in each workshop was too high. The details of the results (questions and answers) in this particular issue are given below.

- What difficulties do you experience when you use ICT?

"The problems are, first, the hardware is not updated. The updated one is too expensive for us. The capacity of the computer is not good enough, the software licenses are not cheap and maintenance costs are high. Secondly, the problems belong to users for they have different skill levels."

(Interviewee F, a male senior university lecturer)

- As you are familiar with ICT, do you have any problems or what difficulties do you experience when you use ICT?

"Mainly, I learn by myself. It was learning by trial and error. Sometimes I learn from textbooks or instructional books and by asking experts. I am not expert in these things just medium level. I am a user, I am working in the education fields and am not good at IT, so the problem is my computer skills are not good so they hinder my work."

(Interviewee C, a male Assistant professor)

- To use ICT, there should be supporting facilities, shouldn’t there? Where do you use these things?

"There are many things. For example, I have a Login name from my university to connect to the Internet."

(Interviewee C, a male Assistant professor)

- Is there any training in ICT at your university?

"Yes, but it was very hard to learn because it was conducted in a big group."

(Interviewee E, a male Assistant professor)
### 4.3.7.5 Appropriate ways to learn ICT

There were many ways interviewees thought might be suitable to learn ICT. Learning with people of the same age group in friendly environments which included entertainment, a club or a society, was a way that more than one interviewee mentioned. If it is necessary to provide a workshop, there should not be too many members in the class. CAI is useful to help people learning about ICT, however, the computer skills of learners should be considered and also its contents should be attractive. Learning by asking experts and taking notes in order to practise was another method considered successful. In addition, interviewees also stressed that it is important to consider the level of the learners. They also believed that to use only one method may not be enough because each method has different advantages and disadvantages. Using multiple methods should, therefore, be appropriate for this group of people. The information (questions and answers) gives details of what they said regarding this particular issue:

- For senior people who want to learn ICT which method do you think is suitable?

  "There is a club for older persons in Thailand which has been set up to train them to use computers and the Internet. Some older people have learnt ICT and now they have many friends on the Internet and they can also teach other older people to use ICT. So it depends on a person's interests. If we also think we are silly and slow, we will never be familiar with it. If we do not think like that, we may be able to learn. We have to practise many times and if there is any problem, we have to ask an expert".

  (Interviewee B, a female senior university lecturer)

- What do you think if researchers or course developers investigate ICT training aids or training course to assist senior educators make them familiar with the use of ICT?

  "Very good, I strongly agree with this because many senior educators who are already retired or are not yet retired, still work or still have academic goals and have no chance to use this particular technology. For me I think it is very important for people who still want to be in academic fields".

  (Interviewee A, a female former university Vice-president)
So far, have you ever provided workshop training?

"Yes"

(Interviewee F, a male senior university lecturer)

How was it? Was it a workshop by a lecturer in front of the class or for a small group of people with one tutor in each group, or anything else?

"Normally, we set up a workshop with around 25-30 persons with one lecturer and 1-2 mentors."

(Interviewee F, a male senior university lecturer)

What about learning from CAI?

"I think it is a good idea but it may be slow. We have to understand the learners' skills. If they do not have any, we must balance them. I remember the first time I was trained in PowerPoint. Some lecturers taught based on their understanding. They did not give the reasons why they did this. I could not remember. If they had explained it would have been very helpful, not only for senior educators who had never used ICT, but also for the younger people. It is pity."

(Interviewee B, a female senior university lecturer)

Have you ever provided CAI for them? Is it possible to use CAI to do this?

"It is hard because of several factors. For example, some people don't know how to operate the computer. If we provide them with CAI, it will be very difficult for them."

(Interviewee F, a male senior university lecturer)

What about training courses for older people? Should they be in a big class or in a small group?

"It does not matter, a small or big group, but the thing is, we must balance the skills of the learners. Second, if we do not balance their skills, we have to pretest them and then put them into the right level. Finally, it is necessary to
provide the correct number of tutors or TA's may be 3-10 people a class or sometimes 1 tutor per student.  

(Interviewee B, a female senior university lecturer)

• If we have to encourage senior people to use ICT, in your opinion, how can it be done or what suitable methods do you believe are best for this group of people to learn ICT and receive its benefits?

"I would like to give an example. Nowadays, adult education, lifelong learning, or education related to older people have already been put into the Government policies (1999-2002). Therefore, if we practise regularly, we will not forget it. However, for senior people to encourage them to use ICT, the education should be taken into consideration. That means to encourage them we will have to include two things: 1 knowledge, 2 entertainment".

(Interviewee C, a male Assistant professor)

• In your opinion, which method do you believe is the best for you to learn ICT? Why do you choose this method?

"I think workshop training would be good because we can do it by ourselves at that time. To learn from instructional books or CAI alone may be very slow especially for older people. There is a group of people to teach older people how to use computers and the Internet. The members of this group are all older people. They not only provide the knowledge but they have activities to entertain older people. They will help older to overcome the fear of the computer and make them not feel lonely. Older people who have been trained by this group can talk about IT with their children at home and will not feel out of date".

(Interviewee A, a female former university vice president)

• That means there are regular activities and they must be special for older people. Are they different from normal training?

"Yes and the participants are of the same age".

(Interviewee A, a female former university vice president)
• And they still need to use ICT too.

"Yes, because some people have to contact people in other countries".

(Interviewee A, a female former university vice president)

• Today which ICT resources have you used?

"Normally, I ask my staff to do for me, I am a user".

(Interviewee A, a female former university vice president)

• If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?

"I think it would be useful. Actually, I have many books both in English and in Thai but they are not attractive to learners. It would be good if they were more attractive".

(Interviewee D, a female Assistant professor)

• Could you follow them [a big group workshop]?

"I could but it did not understand very clearly. After that I needed to learn using the method I told you about. I can go faster than my friends of the same age group and learn in the normal way I practice and when I have questions, I ask. For senior people, I think this method is quite successful and it is better than to learn from the beginning. Because we are old, we need to learn by short cuts. This is my understanding because I have tried myself and was successful".

(Interviewee E, a male Assistant professor)

• Do you think it is good to use CAI to help senior educators use ICT?

"CAI actually is needed. Learning from CAI is not old fashioned. It is especially useful for older people who live faraway from the city and find it inconvenient to travel. Therefore CAI is still important in my view".

(Interviewee G, a female senior university lecturer)
If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?

"I strongly agree with this, especially for senior educators because we find that these groups of people still need to learn by themselves and it is sometimes not convenient to travel".

(Interviewee G, a female senior university lecturer)

Between CAI and organizing a workshop or course in small groups, which would be suitable for senior educators?

"I will not choose to learn only one method because learning in a group with other people such as younger people will cause the class to run slowly. As I am a hit slow, learning by oneself with instructional books is good because I can learn without any time limit and do not disturb other people. However, older people normally stay alone so to learn in a group, older people will have friends and not feel lonely because they can talk with other senior people. Therefore, I will choose the middle way, e.g. using multi methods".

(Interviewee D, a female Assistant professor)

4.3.7.6 Other suggestions

In the interviews, interviewees were given a chance to talk or add other suggestions about this question and details of their comments are as follows:

Finally, do you have any suggestions for the researcher in this particular issue?

"Remember senior educators will use ICT whenever

1 They feel it is convenient
2 They have time
3 When they have an advisor.

(Interviewee H, a male Assistant professor)

If there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think it is a good idea?

"In my opinion, we have to look at the goals, what they want to learn ICT for. Whenever learners have goals and know what to learn, it will be a success if
not, they may be interested only at the beginning but after that they will become bored and not understand and not want to learn any more. If we train people who are really interested, they will be likely to learn and become familiar with ICT. To sum up, the goals of the learners are important."  

(Interviewee F, a male senior university lecturer)

Finally, do you have any suggestions for the researcher in this particular issue?

"We have to focus on the skills of the learners and their goals to use ICT. We still have to train them then let them learn from the CAI alone. Sometimes we give them the CAI but they never turn it on because they don’t understand or have no time, so it is useless. Therefore, the thing we have to do is to make them understand how to use it and the exact significance of using ICT. If we train them, we must know how to encourage them to use it.”  

(Interviewee F, a male senior university lecturer)

So self learning is still difficult for them, is it?

"In self learning, learners must have goals first. If we just give them CAI, they may not be interested. Like a student, the teacher must detail the objectives of learning for them and then students will study”.  

(Interviewee F, a male senior university lecturer)

Finally, if there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think this is a good idea?

"We must understand that the nature of older people is they may be slow. They know ICT is important but they are still slow”.  

(Interviewee A, a female former university vice president)

Finally, do you have any suggestions for the researcher in this particular issue?

"The researcher should consider that learners have many levels so the tools or teaching aids or training courses should be based at the level of the learners”.  

(Interviewee G, a female senior university lecturer)
"Today, technology has many facets, but how can we merge them and encourage people at every age to realise the benefits. This is an important point. The Government should have a policy to encourage people to learn about ICT otherwise we cannot compete with other countries."

(Interviewee C, a male Assistant professor)

"I am sure, it is useful."

(Interviewee D, a female Assistant professor)

- Are you still interested in ICT?

"Yes, I am and I think other senior people will think the same as me. Don’t forget to make it attractive with sound and movies for then it would be good."

(Interviewee D, a female Assistant professor)

- If there is a researcher who would like to develop teaching aids for senior educators to learn ICT, do you have any suggestion?

"It depends on personal interest. We need to study how necessary ICT is for them. The study does not need to focus on only senior educators, however it can be any older person. Another thing is we need to provide facilities for them such as user name and passwords to logon the Internet."

(Interviewee C, a male Assistant professor)

- Finally, if there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think is it a good idea?

"As I told you, there are many ways to learn. Learning from the beginning step by step, the learners will know exactly, but for senior people, it is hard because it is rather slow. For me, this strategy was successful and I also advise other older people to learn in this particular way for I am sure they will enjoy success too."

(Interviewee E, a male Assistant professor)
4.3.4.8 Summary

In this section, quantitative and qualitative results from respondents revealed Thai senior educators' opinions regarding the best way to learn ICT. Overall, it can be seen that they believed Method 3, Workshops in small group training with one mentor in each group is preferred. Learning in a small group is easier because people can be placed in each group according to levels, participants are less likely to feel bored, shy or nervous because they have friends with similar skills and ages to confer with, share ideas, knowledge and analyse problems between themselves or with their tutor Method 2, Workshop by peer to peer training in groups with one peer and one trainer in each group, was the method respondents chose next. Even though respondents said that it had similar advantages to Method 3, it costs was more expensive. Methods 4 and 5, Self learning by using E-learning or with CAI and Learning from an instructional book respectively, were chosen less than the other methods. However, the percentages of respondents who selected them were similar for Method 4 and 5. They can decrease problems of concerned Thai senior educators about limitations of time, place, travelling and the skills of learners. In addition, people were concerned about disturbing other learners if they could not follow lectures. Very few respondents chose Method 1, the intensive course because they were concerned about the large number of learners, time limitations, and difficulties in following the class when they lost concentration during lessons.

Furthermore, from many suggestions from the qualitative results involving open-ended questions, it can be concluded that learning by asking other people whenever there is doubt and taking notes and practising is an alternative suggestion, confirmed by Thai senior educators as successful. People who can give advice can be experts or even their children. Learning by using technology media such as satellites or television programs are other choices. A club for senior people to exchange knowledge, information and communication technology, learning and evaluating results to catch up, should be available regularly. Providing opportunities for senior educators to try new ICT programs or ICT hardware in public are also needed.

More suggestions received from the in-depth interviews were categorized into four issues as follows:
First, the learning styles of Thai senior educators are generally the result of workshop training, personal study, and by asking people.

Second, the difficulties in learning ICT for Thai senior educators are the lack of ICT facilities, including hardware and software, the handbooks are not easy for them to understand, and there is a lack of other facilities such as user name and passwords to access the Internet.

Third, appropriate ways to learn ICT are learning in a small group or a club with members of the same age. Entertainment learning or using self-learning tools such as suitable CAI are needed, and mixed methods, the advantages of various other methods is also advised by Thai senior educators.

Finally, other suggestions from Thai senior educators that should be noted; they will use ICT when they feel it is convenient, when they have time, when they have an advisor, and when they have goals and know what to learn. Moreover, the skills of learners and other factors influencing this particular age group, as discussed previously, should be noted.
5.1 Introduction

This chapter includes a discussion of the results from Chapter 4 and the conclusions of the study. In the discussion, quantitative information, qualitative information and the literature review will be integrated with the analysis and discussed for each research question. The final section, the conclusion, consists of a summary of the study and its findings and ends with recommendations for further study.

5.2 Discussion

The results in Chapter 4 presented facts and opinions of Thai senior educators about using ICT in their professional lives according to each research question. In this section, results from the analysis of the data in Chapter 4 and the literature review will be discussed. Seven research questions will be dealt with separately. Number 1-6 concern the professional goals of senior educators in Thailand and Question 7 illustrates their beliefs regarding the best way to learn ICT.

5.2.1 Research Question 1:

"What are their professional goals?"

Research Question 1 is the first main research question in this study. This section will discuss and explain what the professional goals of Thai senior educators are. The tool used to investigate the answers is a questionnaire, consisting of quantitative data, qualitative data from opened-ended questions, the data correlation of questions and data from in-depth interviews.
This study focuses on senior educators in Thailand aged sixty and over. Most of Thai public servants over sixty will retire, the official age for retirement, and will stay at home and others enjoy life with their children without any permanent work. Data from Research Question 1 shows that many Thai senior educators are different. Even though they have retired, the majority do not want to stop working but to continue in their professional life because they believe their current skills and abilities can be of service to the community. This is good for senior educators and for society too. It is similar to the results of the correlation coefficients that Thai senior educators who think their current skills and abilities can continue to be used to support their work in their professional life are willing to keep working. Moreover, the results found five years, or for as long as they can work, are appropriate periods for them to continue to work according to their needs and health.

Regarding the activities they wish to do in which they were involved before retiring, time and work loads are the important factors for them to consider. Even though the data from the correlation shows most of the activities they wish to do in the future or are doing at present, are similar to those they did before retiring, the percentages of some activities are less than the activities they did in the past which concerned classroom lecturing, work entailing curriculum specialists, and administrations. On the other hand, the trend of Thai senior educators eager to work as part-time lecturers, consultants, academic writers, and researchers has increased. Feedback from in-depth interviews revealed the work status and details of senior educators who are still working in educational fields. For example, teaching as part-time lecturers at the university and working for a company or a factory as advisors but not full time work. It can be clearly seen from these results that even though they have already retired, they have free time to work but still need private time. As they are also concerned about their work load, any activities they undertake do in the future should not disturb their personal time and should reflect a lower work load. This study found that their preferred activities were acting as part-time lecturers, consultants, academic writers, and researchers.

This study not only found what activities Thai senior educators intended to do after retiring, but the results from qualitative data; opened-ended questions and interviews showed their opinions about their professional goals. These opinions can be categorized into two main groups.
The first is the professional goals that provide benefits directly for themselves. They maintained that they hoped to continue developing their knowledge and performance in the new technology. One of the reasons is the Government's policy that these people are needed to teach and conduct research in their respective fields (Khaosod, 2002). As they still have the ability to perform and will be supported by the Government to work in their fields after retirement, most of them are willing to continue working as educators.

The second professional goal relates to the benefits they derive for themselves and to society and also includes personal preferences. Feedback from the interviewees also points out that there are not only Thai senior educators' benefits but their professional goals involve using their knowledge, skills and experience to assist society. For example, they can write academic articles in journals, explore new know-how and learn how to apply to their present job and make it available to the new generation (see the interviewees' transcripts in Chapter 4).

Nevertheless, the results from Research Question 1 revealed that in order to help accomplish professional goals four other factors need to be taken into consideration.

The first factor is convenience. From the results, Thai senior educators like and are willing to work when it is convenient and/or when there are proper facilities to support them. Thai senior educators agree that it is a factor that helps them to decide whether they will follow their professional goals or not.

The second is professional dedication. One participant explained that she loves to be a teacher so much because she can share her experiences with other people, and she would like to see them become good members of society. Participants also indicated that another reason they wish to keep working in their fields, because they do not want to keep their knowledge or experience only for themselves, but would like to let other people know what they have learnt as well.

The third factor is the concern for their students. The absorbed relationship between teacher and pupils is one factor that influences Thai senior educators staying longer in education. Participants explained that they are thinking of their students and that they would like to continue providing them with knowledge as they did before.
retiring. Therefore, it can be seen that whenever educators have an opportunity to teach and assist students, they are very willing to continue working in a professional position.

Finally, the personal beliefs of Thai senior educators is another factor that encourages them to continue working in their profession. One participant said that she believes that if we give our knowledge freely, then we will receive good things in return. Another commented that he wants to teach because when he teaches somebody else, he is also practising and gaining knowledge too. Even though each person has his/her own motives and reasoning on this particular point, in the end they would like to continue working to provide knowledge and experience to their students and society.

To sum up, even though the professional goals of Thai senior educators are to keep practising their knowledge and gaining experience and providing them to the public, they are still concerned about time and work loads. In addition four other factors, convenience, professional dedication, concern for their students and personal beliefs also impact on the achievement of their professional goals.

5.2.2 Research Question 2:

"What are their attitudes about using ICT to achieve their professional goals?"

The analysis of the data and data correlations from the questionnaire for this question revealed that the attitudes of Thai senior educators about using ICT to achieve their professional goals tend to be good.

The data collections used 10 Likert scale sub questions to address the attitudes of Thai senior educators toward how much they agree or disagree with the statements in each question as follows.

The first question mentioned "Computers and the Internet now play great roles in education" and the analysis of the results indicated that most participants had highly positive attitudes towards computers and the Internet now plays importance in the education. Only one person disagrees and no one selected strongly disagree with this point. The reasons the majority answered in the same way are today computers and the Internet are common teaching aids in education and the use of these tools provides huge
advantages in supporting their work activities. Oliver (1998) mentioned that computers have been used in this particular setting since the late 60s. Even though some senior educators have not been formally trained in ICT, they have become very aware of its value. Today it is very common to see computers being used in supporting teaching activities. In addition, the literature review also reveals that there are many advantages of using a computer in education, for example, presenting pictures, finding information, or talking to students and colleagues. Moreover, computers can be entertainers for educators too (Geisert & Futrell, 2000). These are the reasons this group of people agrees with the statement in this question.

The second question concerns the statement "It is only suitable for younger people". Senior educators show by their attitudes that very high percentages strongly disagree and disagree that ICT is an appropriate tool only for younger people because today older people too are interested in using it in everyday life. Many articles in the literature and research support these results. For example, a survey by Age Concern and Barclays shows that two-thirds of IT users who are above 55 agree that the Internet has had a positive impact on their lives (Ageconcern.org.uk, 2002). In Australia, growth in the use of the Internet of people 55 and older is growing dramatically as it as in the United States and Canada (Merkes, 2000). In Thailand, even though the numbers of people over 60 are using ICTs, for example, the Internet, numbers are still lower than other aged groups. However, the highest percentage of Thai Internet users come from IT, education and research careers (NECTEC & NSTDA, 2004) because persons in these careers realize the benefits of using ICTs for various purposes. Participants in this study who are still working in educational environments with day to day contact with ICT facilities think age should not be a limitation for using ICTs.

The third statement is "Everybody should know how to use a computer and the Internet". These technologies are widely accepted and used in human societies around the world (Nasingkun, 2003). Most senior educators agree that everybody should know how to use a computer and the Internet too as the percentages of either strongly agree or agree are very high. While, the percentages of participants who strongly agree in the next statement that "Educators should know how to use computers and the Internet" are very high as well (75%) for this particular point, no one disagrees or strongly disagrees. These results show that Thai senior educators' views about everyone using ICT are
positive. In addition, as educators, they believe ICT is necessary so they should be familiar with it.

Thai senior educators think ICT is useful for achieving their professional goals. The results show high percentages to support the fifth and sixth statements that "Using ICT helps me to gain more skills, experience, and better performance in my [Thai senior educator] professional goals" and "ICT will provide more advantages for my [Thai senior educator] professional life than disadvantages" respectively. They believe they can benefit from using ICT in several ways, their views being supported by Brown (2005) who state that by using ICTs in education, new ways can be learnt to teach students, time can be saved in lesson planning and administration, and a more comprehensive approach to assessment can be realised.

Even though Thai senior educators think ICT is useful for achieving their professional goals, most are still uncertain about statement seven, "I am quite familiar with using ICT in my professional life" because, like other older people, they are still concerned about using new technology. Heuston (2002) mentioned that poor performance of sensory organs of the body, lack of confidence, fear of embarrassment in training or tutorial setting, and difficulties of transport hinder or may obstruct older people getting used to the new technology. Even if they know ICTs provide benefits to support their professional goals, they have to face these problems, therefore, it may be hard for them to familiarize themselves with ICTs. Researchers and those who have to deal with senior people should take these factors into consideration.

Regarding the statement "ICT is not hard to use if I have a good advisor to guide me", the results show most agree. While older people are slower in getting used to new technology than younger people, if Thai senior educators have received good training appropriate for older people or know someone who understands the nature of older people very well to advise or ask when they have some questions, then they think using ICT is not too hard to learn. For these reasons, therefore, the results shown in statement seven are the majority of Thai senior educators agree with "I should not fear using ICT". However, some may still be concerned with the barriers explained in the previous paragraph.
It cannot be denied that today computers and the Internet play great roles in education. For the last statement, in their opinions on "The computer and the Internet are important in supporting their academic goals", they indicated how ICTs can help as will be explained in the next question (How can ICT help them to be successful).

This research question clearly found that the attitudes about using ICT to achieve Thai senior educators' professional goals were likely to be positive as the results can be interpreted that they agree using ICT is a useful activity to support their academic activities and assist in attaining their professional goals.

5.2.3 Research Question 3:

"How much do they [Thai senior educators] believe ICT can help?"

It is clear from Research Question 2 that Thai senior educators have positive attitudes about using ICT for their professional goals. The findings from the data analyzed concerning Research Question 3 (the beliefs of Thai senior educators with regard to how much ICT can help them) are discussed in this section. The analysis used a Likert scale and multiple-choice questions which were classified into eight parts.

The first and second parts of the results in Chapter 4 that concern Research Question 3 focused on how much they believe ICT assists them to achieve their goals. In the first part, the beliefs about using ICT to accomplish Thai senior educators' goals are very high. Most strongly believed that using ICT can increase working convenience, can save work time, can increase the volume of work capability, and enable their work to be done more efficiently. This shows that Thai senior educators realize the benefits of using ICT. The percentages of people who do not accept these benefits are very low and nobody chose "strongly not believe" in this section. The second part seeks respondents' opinions about using ICT to achieve professional tasks by asking about specific task activities that ICT can perform in education. The overview of respondents indicated very high percentages of beliefs about this point as they "strongly believe" ICT can help them in activities. For example, most of them strongly believe ICT can help to customize their own resources to support their teaching, enables them to be inspired and motivated by new and innovative methods of learning, and improves learning and teaching. As regarding designing educational aids and enabling them to follow students'
progress, even though the majority did not strongly believe ICT can help, still believe it can help at a high level. These results are in line with other views in Chapter 2 that ICT provides benefits to educational societies and can support educators in their professional life as well.

The third part concerned hindrances and how much they believed these would obstruct them in using ICT to achieve their goals. Thai senior educators were asked what they think about the following seven hindrances: first, do not own/ have ICT facilities or devices, second, afraid/lack confidence to use it, third, costly, fourth, have tried but did not enjoy it, fifth, have a disability that makes it difficult, sixth have no interest, and seventh, not enough time. From the analysis of the data in this part, it can be seen that the most important thing that can be an obstruction is that they do not own/ have ICT facilities or devices. On the other hand, time is the final point of concern. A few believe that it could hinder them using ICT because most do not work full time and the results to Research Question 1 indicated in the same way, that they prefer to have some private time and do not have too heavy a workload. Most of the others are not concerned about time limitations because they know they have time to use ICT. However, the important thing Thai senior educators or others who are related to these groups need to take into consideration focuses on ICT devices or facilities that senior educators can use.

Part 4 in Research Question 3 indicated how strongly Thai senior educators believe in the factors that will encourage them to use ICT. From the results, it can be clearly seen that most strongly believe that if learning to use ICT is good or if there are adequate facilities to learn, they are willing to use it to support their professional goals. This result is in line with the previous data in Part 3 that Thai senior educators believe facilities for supporting the use of ICT or to own ICT devices are important. Time is another factor that can encourage them to use ICT because if they have time to become familiar with ICT, they strongly believe this will encourage them to use it. Older persons however may take longer to get used to and work with the new technology unlike younger people whose physical movements and decision making are quicker. Even though they indicated cost is not a main hindrance, most believe that if the costs of ICT and its facilities are reduced, this will encourage more of educators to use it. In addition, the data revealed the majority felt that if they are provided with a more convenient way of learning ICT and if there is exposure to more education facilities, they are willing to use it. In this regard, Thai senior educators need someone who
understands the nature of older people to train them or who can be asked questions and or discuss their difficulties personally. They do not wish to be trained in a very big class.

The results in Part 5 show how senior educators' belief in ICT can help them if they were once familiar with it. From the results, it seems that if they have had an opportunity to use ICT, it will not hard for them to apply this knowledge. Nevertheless, to help them become more familiar with it, the factors explained previously should be taken into consideration as well.

Parts 6 and 7 asked how much they believe using ICT can help and if they have an opportunity to use it and do they believe it can help them achieve their professional goals or not? The results show high percentages of Thai senior educators strong believe and believe that ICT can help. Moreover, if they have an opportunity to use it, they are willing to try as everywhere the nature of every teacher is to consistently to seek or try to gain new knowledge.

Using ICT challenges the education system (Jensen, 2003) and also provides great benefits to education (Brown, 2005). From the literature study, there is no doubt why the results in the final part revealed their views on how ICT can benefit current education as very high percentages show that ICT can benefit educational societies. It can also be said that no matter their age, many different people believe ICT can provide benefits to education.

To sum up, after the discussion of the results of Research Question 3 involving an analysis of this question, the literature review and the study's research, it can be concluded that Thai senior educators believe ICT can help them to achieve their professional goals. However, some factors such as hardware, training facilities, time, and convenient ways to support them to master ICT need to be in focus with their particular needs.
52.4 Research Question 4:

"What level of ICT do they need?"

Using ICT in education is important for the majority of Thai senior educators. There are high positive beliefs and attitudes towards its use and from the results it can be clearly seen that overall Thai senior educators think ICT is needed for the attainment of their professional goals as well.

They need to use ICT, for example, a computer and the Internet to support their goals. It is widely acknowledged in education that the Internet offers people in these areas great opportunities to increase knowledge from the resources and the functions of the Internet (Forcier & Descy, 2005).

There are many benefits to be enjoyed from using ICT in education and Thai senior educators stated that whatever ICT can do, if it is beneficial they would like to use it but they feel some people know it can help but do not know exactly how they can use it to support their work. This makes them doubtful whether ICT can help them or not. For example, according to the results from an in-depth interview, one interviewee who needed to use ICT stated that he was not sure of the benefits of using it and how it could help his academic work as follows;

"I have never used it because I do not have many classes. When I teach, I provide documents paper and worksheets for my students and sometime use a pen to draw the structure of chemical formula on the overhead transparency. I am not sure if PowerPoint can do this thing or not?"

In asking about the level of senior educators' desire to use ICT to help achieve their professional goals, the results show most indicated that they do. This seems to be accepted by the majority because of the high correlations between the levels of their needs of using ICT to help them achieve academic goals and the levels of senior educators' desires to use ICT to help achieve professional goals stamp the results in this particular point as well.

However, it should be realised that the need to own an ICT device or to use ICT facilities are very important. Previous results show that they need the benefits of ICT to support their goals, but it may be hard because some are still not familiar with ICT. To get used to the devices and facilities is very important. For example, using a computer and the Internet for work may be hard for older people because to know about the
functions of and to use a computer may take time and skills. However, if they have opportunity to use it regularly at home, this may increase their familiarity with it and contact with a computer and the Internet will not worry them. Another reason is because most are part-time, they spend a great deal of time at home preparing rather than at an institute therefore they need an ICT device such as a computer and access to the Internet at home. The percentages of Thai senior educators who need and strongly need computers and internet access are higher than the other choices. Providing them with ICT should be taken into consideration because computers and the Internet these provide links to the use of other ICT they may need and will help them to become familiar with them later on.

The questions in this part also mention other types of ICT and of uses that Thai senior educators need such as keeping their work and paper documents in a hard disk or CD ROM, the use of email to communicate with others and to prepare lessons by PowerPoint programs. From the previous paragraph, one factor that will help them become familiar with ICT and be able to use it is they must have their own ICT to practices rather than just only using them for a short time at institutes. Practising using their own facilities will enhance their skills and will support their needs using in other ICT.

Finally, it can be seen that as Thai senior educators the desire to use ICT, most need to become familiar with it to support their professional goals. However, as there are many benefits from using it, is important to provide them with this information so they can use it according to their particular needs. Another factor is, if they have their own ICT devices, such as a computer and the Internet to practice and use at home, it will increase their knowledge of other ICT which can support their goals later on.

5.2.5 Research Question 5:

"How can ICT help them to be successful?"

This part discusses the results of Research Question 5 why various suitable ICT activities and the use of a computer in tasks can help Thai senior educators accomplish their professional goals.
As regards suitable ICT activities, the results classify these into 3 groups according to the level of their suitability: Very suitable, Suitable, and Neither suitable nor unsuitable, with reference to searching for information on websites, using a search engine to seek information and needing more direction on using ICT to search for information, high percentages of Thai senior educators believe they are very suitable activities for them. New technology influences access to the information in education today and helps speed the link to information and knowledge (Dellit, 2004). This makes it possible to search, or to receive information easier and quicker than ever before. For example, in the past, if a person needed to know something or to search for information he/she may have to go to a library or a bookstore. With the new technology, however, ICT can help them in just only one click of a finger to obtain that information quickly without the need to travel anywhere. They can use the benefits of ICT via online settings in different ways to do that, for example, to search for information from a website or Search engine on the Internet. In addition, using ICT in an offline system such as CAI to get more direction also can help senior educators gain more information and knowledge as well. Another reason, high percentages of Thai senior educators believe in activities such as transferring a photo or data to other people; checking time schedules; making educational arrangements; using VDO streaming, and watching movies or news, and discussing or chatting with other persons are other ways respondents think can help them achieve their professional goals. These particular activities were chosen by respondents as not the most suitable like the previous groups, but the overview was they were also suitable because many had also selected them.

There are activities about which they are uncertain whether they are suitable or not, such as creating a webpage; posting messages on the web board; buying something via e-commerce and registering information. An interesting point is, even though there is no activity that the majority chose as unsuitable or definitely unsuitable, many respondents thought buying something via e-commerce not suitable and definitely unsuitable more than other activities. They maintained these areas are still uncertain as they are quite new and even though they may be more convenient, they are concerned over the security of personal information. In addition, they still do not understand enough clear about these particular online activities. Therefore, as long as they do not share any confidence in these things, it may be hard to convince them ICT can provide them with benefits from these activities.
The second part in this particular section in Research Question 5 is how the use of a computer can help them. Computers provide considerable potential benefits to persons in educations (Geisert & Futrell, 2000). This seems to be acknowledged by Thai senior educators as results to Research Question 6 show that a desktop computer is one of the most suitable ICT devices. However, as a computer can do a variety of functions, the results in this section are discussed rating suitable task activities that can help Thai senior educators achieve their professional goals.

Two task activities can take advantage of using a computer; first, word processing of tests, handouts and other materials and second, presenting lessons, very suitable activities for Thai senior educators as indicated in the results in Chapter 4.

From an overview of the results in this particular question, preparing academic documents by using word processor programs seem to be the first choice for Thai senior educators because they believe it can enable them to undertake many document tasks that they need for their academic activities. As also mentioned by (Geisert & Futrell, 2000), the use of a Word processor in education, makes tasks easier and saves time and results in a high quality of work. These are reasons that can be interpreted why this particular activity can help them achieve goals.

Using a computer to present lessons is another appropriate activity in the view of senior educators. In the past, teachers used a chalkboard for lessons in front of a class and even though overhead transparencies were used to replace this method later, today using a computer enhances teaching more than past methods. Another reason Thai senior educators believe this activity is suitable and can help them to achieve their goals is the influence of a considerable numbers of software packages that support computers. In presentations, for example, PowerPoint permits the use of graphics, animation, and sound. This program was created by the Microsoft Corporation Company and it is the most popular software currently being used by many lecturers (Gibbs, 2002).

In addition to the features already mentioned, other ICT activities using a computer are keeping records or storing information, preparing lesson plans to facilitate project-based learning activity, communicating with colleagues, participation in online professional development, searching for information for students, assessing a student's studies, seeking peer-to-peer advice and counseling. Even though these activities are not "very suitable" in most Thai senior educators' views, however, high percentages still think they are "suitable" and combined with percentages of "very suitable", and
"suitable", it can be seen that these ICT activities can help achieve professional goals as well.

There are, however, respondents who think some ICT activities are "unsuitable" and "definitely unsuitable", for example, buying via e-commerce, using a computer to communicate with students and parents of the student and to communicate with administrators. Some respondents do not understand clearly what ICT activities in each question refer to because they are not familiar enough with ICT and the activities it can undertake. It is hard, therefore, for them to indicate their views in some questions. There is a small percentage of missing data for some respondents did not choose to indicate any opinion in the questionnaire.

In summary, as found in Research Question 1, Thai senior educators are concerned about convenience and are not comfortable if they have to work with unfamiliar new technology, even though some are interested in and familiar with it, they are not big groups. Professional dedication is one factor that causes them to decide to work with or have contact with ICT in their present life. If they are interested in it or if their duties require ICT to support their professional goals, then there will be groups we have to focus on because they know how ICT can help them. Furthermore they can be trained to apply the benefits from ICT towards the achievement of their professional goals. On the other hand, people who are not interested in or not familiar with the new technology, may think it is not very suitable and do not need to use it because they think the accustomed technology is enough. For example, using a telephone is easy and enough for them to contact other persons. If there is anything requiring technology skills, they will ask other people such as their staff or their children to do it for them. These particular groups may find it hard to become familiar with the new technology, however, if it can be shown how ICT can help them achieve their professional goals more and if they can realize the benefits of using ICT, it will encourage them to develop their skills even though they may not be as competent as people who are interested in ICT. They need to consider what ICT will be suitable and what it can do to help them to succeed. This is addressed in Research Question 6 in and will discussed in the next section.
5.2.6 Research Question 6:

"What appropriate ICT do they need to succeed?"

With the rapid development of ICT today, it can be seen that many devices and software are assisting educators in their academic activities. Each type of ICT has various benefits and functions depending on goals. However, for some senior educators who are not familiar with this new technology, not every type will be suitable because it may be thought some may be hard to use and there is not often much chance to use them. Therefore, to consider what ICT they can use, how often they use it and how much they believe a particular ICT can assist in the accomplishment of their professional goals, is important. These factors will help them understand what ICT is suitable.

The data correlation in Chapter 4 between Thai senior educators in this study who believe ICT can assist them to achieve their professional goals and how often they use it are investigated in Research Question 6. A cell-phone is thought to be one of the most useful ICT devices being used widely in today's educational societies. With its multiple functions, senior educators have an opportunity to select what functions they feel comfortable with and employ them to support their professional goals. The results show that they think this tool is a suitable form of ICT for them. Another device, a computer provides many advantages for education (Geisert & Futrell, 2000). From the results, there are strong indications supporting this particular point, most educators use desktop computers often and believe they can assist them in reaching their professional goals, thus a desktop computer is appropriate for their use. In addition, the results in this section revealed that a printer and a scanner are also considered suitable devices because these powerful tools can enhance a computer's applications. A scanner helps import data from the outside and transfers it into a data format that can be read and used with a computer. A printer helps educators present data in a document format which can be applied to work with other academic tasks according to each person's needs. Even though today a PDA (Personal Digital Assistant) is one of the most popular handheld pieces of technology in societies, and in some countries they have been provided to staff to support a variety of educational needs (Lamb, 2000), in Thailand the cost of this particular device is still high and the Government does not yet plan to support educators with this kind of tool. Therefore, in Thai senior educators' views, this tool may not be
appropriate at the moment compared with other ICT devices such as a desktop computer, a printer, or a scanner.

For Thai senior educators to gain benefits from computers, software tools are necessary. The results in Chapter 4 indicate that three software packages are considered the most suitable, the Word processor, Software presentations and Spreadsheets, as they can support educators in various ways.

In the literature, Geisert & Futrell (2000) detail the use of Word processor programs that help educators in preparing instructional materials, worksheets, reports and saving data into electronic files. Time and space are saved and it is easy to print them out. Spelling, errors and grammar can be checked too.

A presentation software tool is another program that is also used in education as it enhances and enriches classroom instruction in every subject area (Gibbs, 2002). In the majority of Thai senior educators' views, this software is suitable to support their professional goals even though some have trouble using the program, they said they do not have adequate skills or are not familiar with preparing lessons using this program. They are willing, however, to try and often obtain help from staff at their institutes (or from their own children).

Spreadsheet programs have become very popular software. They allow users to calculate, organise data in columns and rows and collect them in electronic worksheets and provide a variety of useful statistical function to create bar charts, and graphs (Shelly et al., 2006). The majority of Thai senior educators think this software tool is appropriate because it is popular in the education setting and having used it, realize its benefits to support their professional work. Some do not know how to use this program very well but still wish to learn it because they know it can help their work.

Other software tools provide benefits for education, for example, CAI, Search engines, Graphics and multimedia programs, however, results show that Thai senior educators' interest in these are at medium level. Even though these tools are not seen as appropriate software tools for this group at the moment, it does not mean they are definitely not appropriate. On the other hand, a few lecturers think they are of use. CAI,
Search engines, Graphics and multimedia programs should, therefore, also be taken into consideration for they may suitable them in the future.

Finally, interest in Calculation programs and World Wide Web browsers can be interpreted that they are not suitable software tools for Thai senior educators.

5.2.7 Research Question 7:

"What do they [Thai senior educators] believe will be the best way for them to learn ICT?"

Research Question 7 asked educators' opinions on what they believe is the best way to learn ICT. It investigated methods of learning to help researchers, and course developers understand it and why it is a suitable way. The answers can be applied in preparing appropriate training courses that will help groups get used to the new technology. It will provide useful data for researchers who are studying related topics.

As the results of this particular part were presented in quantitative data from the questionnaire data from opened-ended questions and In-depth interviews in Chapter 4, the results of this section are discussed as follows:

The questionnaire contained the following five scenarios for Thai senior educators covering all suitable current methods that can be used to learn ICT:

- Scenario 1: Workshop by a lecturer in front of the class
- Scenario 2: Workshop by peer to peer training in groups with one peer and one trainer in each group
- Scenario 3: Workshop in small group training with one mentor in each group
- Scenario 4: Self learning by using E-learning or with CAI
- Scenario 5: Learning from an instructional hook asked Thai senior educators

The results found that the usual learning styles of Thai senior educators have been by workshop training, self-instruction, and by asking people. However, in the survey of their opinions on the five scenarios in Chapter 4, the majority of them chose Scenario 3 to be their favoured method. The results found that Scenario 2 is also a popular choice. Respondents selected these methods because they used small group
training as it is easy to place people into groups according to the difficulty of the lessons based on a learner's ability. This is good for themselves and for lecturers, progress can be swifter because learners have the same skills and are not concerned with their own speed in relation to other learners. In Thailand the number of senior people who use ICT is still low compared to other age groups (Sungsri, 1999). Even though they may be of the same age, there are different skill levels and in small groups, they believe it is easy to classify levels and put them into small groups rather than have a big group.

Moreover, they said that by learning in a small group, they have more opportunities to exchange ideas, knowledge, information and analyse problems between members of their group in a short time. In a large group training course, it is hard to do this if members do not understand the content or fear disturbing others in the class. A lecturer may give opportunities to ask questions but this cannot be done too often. Another point is they feel less stress learning in small groups because they can ask questions directly to the tutors who can monitor them without causing them to be shy or nervous and they do not have to worry about disturbing other people in the class or stop the lesson while they asking questions.

Scenarios 3 and 2 have similar advantages, however, some differences between these methods cause Thai senior educators to think Method 3 (in small group training with one mentor in each group) is more suitable than Method 2 (Workshop by peer to peer training in groups with one peer and one trainer in each group). First, in learning in small groups, Thai senior educators feel entertained because they have friends of the same age and it is better than just talking to only 2 people in a group. This was indicated by many respondents in the interviews who stated that it is a normal characteristic of senior people to need to have friends to talk to. Secondly, learning in a workshop by peer to peer training in groups with one peer and one trainer in each group is costly. This method not only needs preparation by tutors for each learner, but also has to take into consideration lessons, places, and times for each learner as well, whereas, Method 3 can reduce costs. These are the reasons Thai senior educators chose workshops in small groups with one mentor in each group as the best method.

The percentages of respondents who chose Method 4, Self-learning by using e-Learning or with CAI and Method 5, Learning from on instructional book are at medium level. These methods provide certain advantages, in that they do not have to be concerned about the speed of learning or limited time availability. In addition, for
self-learning methods they can learn anywhere and at anytime. Method 4 requires learners to use computer technology and it seems they can be attracted by the entertainment factor in lessons. The results in general show Thai senior educators still want to communicate with other people rather than to study alone. Method 5 is a very simple technique that anybody can follow without any advisors or technology in support. However, the results indicated that to study from text books or instructional handbooks, Thai seniors educators need to learn by themselves which may be hard because if they have any questions, they cannot solve them by themselves and sometimes it is not possible to contact experts who know about a particular topic. In addition, the method makes them feel bored because they have to study alone and according to feedback from the interviews, they prefer to have friends with whom they can confer.

Only 4 people chose Method 1, a Workshop by a lecturer in front of the class, a common way to train people. It is a simple and intensive way which can be completed in one or two days and is good for a person who has some background or skills in those particular topics. However, in Thai senior educators' views, this method may not suitable because of the levels of the skills of the learners, the large number of members in the courses and the fact that they have to concentrate a great deal on the contents otherwise they may not understand.

In-depth interviews were conducted to obtain further information to explore respondents' answers and to support the quantitative results. A great deal of the extra material from the in-depth interviews can be classified into four issues; learning ICT, the difficulties in learning ICT, the appropriate way to learn ICT and other suggestions. These areas are discussed to complement the questionnaire information and to cover the aim of this particular research question.

Information from the interviews revealed some interesting suggestions that could be applied to learning methods. For example, learning in small groups by providing knowledge and entertainment, called Edutainment learning, is interesting. There could be clubs with members of the same age where learners will not only receive knowledge from joining in, but also are provided with entertainment from friends and tutors. These factors can make them feel more comfortable and help decrease stress and
nervousness when they are learning ICT. The clubs could be in their institute or set up somewhere outside.

The most appropriate learning methods are mainly in small groups, as seniors prefer a compromise with entertainment and knowledge in the lessons. However, another suggestion interviewees mentioned was using a variety of methods to support learning. It is a good idea to use mixed methods for Thai senior educators, for example, using self-learning tools such as suitable CAI, or practising from instructional books or using technology media such as satellites or television programs, all other choices on training courses. Nevertheless, these particular media must be attractive and designed specially for these groups to put them at ease, to create a friendly atmosphere and make it easy to learn.

In addition, some senior educators are still concerned about problems they may face when they are practising ICT. One interesting idea that can solve this problem is asking other people and taking notes and practising. Although this method seems simple, Thai senior educators confirmed it was as successful during the interviews. People who can give advice directly can be experts, their children or a tutor from a club.

Finally, regarding the discussion of the results from the quantitative and qualitative data for Research Question 7, it can be concluded that for Thai senior educators, the most appropriate way to learn would include the mixed method, learning by integrating in small groups with an entertainment environment, providing opportunities to confer with persons who can answer questions in the use of ICT and the chance practice by themselves with the media designed for these particular groups. There should be consistency in the method and results should be evaluated regularly so that Thai senior educators can learn how to use ICT.
5.3 Conclusions

This section starts by summarizing the purpose, significance, methods and results of the study. It also includes a discussion of the implications concerned with the use of ICT by Thai senior educators and the limitations of the study. Finally, recommendations are provided for further study.

5.3.1 Summary of the study

This study was initiated to investigate the use of ICT by Thai senior educators and to discover their beliefs, attitudes, and level of needs. It also explored appropriate ICT and the best way to learn to use it. The study focused on case studies of senior educators in Bangkok, the capital city of Thailand and its surroundings where there is central use of ICT and where facilities are good.

The study reveals significant results that can help Thai senior educators themselves and persons associated with these groups to understand how ICT can enable them to reach their professional goals. It also assists course developers and designers to make aids and conduct training courses to assist them to get used to appropriate ICT. In addition, once familiar with ICT, Thai senior educators can feel easier living in our modern society.

The results of the study answered the two major research questions. The first major question concerned their professional goals and this group consisted of six questions. The second concerned the best ways to learn ICT. The questions and the results are summarised as follows:

Research Question 1: Professional goals

The professional goals of Thai senior educators are to use their knowledge, skills and experience to support both their current and future activities, because the majority believed that their current skills and abilities can continue be used to support their work in their professional life and they are willing to keep working. In addition, this particular finding also reveals that Thai senior educators view their professional goals will benefit both themselves and society. They know they can use their abilities and would like to
continue working for at least 5 years or as long as the work is similar to what they had been doing before retiring, albeit with a reduced workload. The participants detailed the motivating factors that led them to continue working in categories such as convenience, professional dedication, concern for students, and personal beliefs.

**Research Question 2: The attitudes of Thai senior educators about using ICT to achieve their professional goals.**

From the results in this particular issue, it can be seen that the attitudes of Thai senior educators tend to be positive. They agree computers and the Internet now play great roles in education and are important in supporting their academic goals. ICT should not just be for younger people for respondents thought everybody should know how to use a computer and the Internet, especially educators. In addition, they acknowledged that using ICT can help them gain more skills, experience, and enable them to give better performance in their profession goals because they think ICT will provide more advantages for their professional life than disadvantages. They indicated that not all senior educators are familiar with ICT but it is not hard to learn how to use it if they have good advisors to guide them. This, however, may not be enough because some are still unsure that just providing an advisor may not be enough to help them learn ICT.

**Research Question 3: The beliefs of Thai senior educators in using ICT for their professional goals**

It can be seen that the majority of Thai senior educators believed at high levels that using ICT is helpful for them and for education in society. ICT is accepted by most respondents as it can help them in a variety of activities that relate to their professional goals. They also believed if they have an opportunity to use ICT, they will try it because once they become familiar with it, they believe it will help achieve their professional goals more easily. Moreover, to own or to have ICT facilities or devices is very important because without them, there are barriers for them to learn ICT. In addition, they state that being afraid/lacking confidence to use ICT, or if the cost is too high and if time is limited, also hinder them from using ICT. On the other hand, as an incentive, most respondents believed that if there are better learning facilities for ICT, or if time spent learning to use it is appropriate and the cost is cheap, they are willing to learn.
Research Question 4: The needs of ICT by Thai senior educators

Overall Thai senior educators' needs of ICT in their academic life is at a very high level. Furthermore, the percentage of senior educators who do not need and who definitely do not need ICT are very low. Some factors could have influenced these negative responses, maybe they do not have enough information about the variety of benefits from using ICT to help them achieve their goals and some have had no previous experience of ICT. However, these groups state there could be a need to use ICT in the future if they are provided with more information.

Research Question 5: How ICT can help Thai senior educators to be successful in their professional goals

The results indicated that ICT can help Thai senior educators in many suitable tasks and activities to accomplish their professional goals. Most respondents think that searching for information on websites, using a search engine to seek information and gaining more direction are suitable. In addition, using a computer can help them in many professional tasks too. To support their task activities, most respondents agreed Word processing was helpful to manage and organize tests, handouts, and other materials and giving presentations in class are considered very suitable.

Research Question 6: The appropriate ICT do Thai senior educators need.

The strong correlations of ICT often used by Thai senior educators and their beliefs these particular tools can assist in the accomplishment of their professional goals. It can be concluded that a cell phone is considered to the most appropriate ICT device but a printer, a desktop computer, and a scanner also are necessary. The most suitable software tools for Thai senior educators are a word processor, software presentations and spreadsheets. On the other hand, ICT devices and software tools that are not considered suitable are CAI and calculation programs.
Research Question 7: The best way for Thai senior educators to learn ICT

This, the second main research question area, concerns the beliefs of senior educators in Thailand regarding the best way to learn ICT. The results illustrated that the majority believed Workshops in small group training with one mentor in each group is the best way to learn. Workshops, peer to peer training in groups with one peer and one trainer in each group was the method respondents chose next. Self learning by using E-learning or with CAI and Learning from an instructional book were chosen at a similar level but less than previous methods. Very few respondents chose Workshops with a lecturer in front of the class.

Furthermore, from many suggestions from the qualitative results involving opened-ended questions, it can be concluded that learning by asking others and taking notes and practising is an alternative and was confirmed by Thai senior educators as successful. A club with regular meeting for senior people to enable them to catch up with learning and to evaluate results, and opportunities for senior educator to try out new ICT programs or ICT hardware were other suggestions.

Four other suggestions came from the In-depth interviews. First, Thai senior educators generally like to learn in workshop training, by themselves, and by asking people. Second, there are difficulties in learning ICT as the result of a lack of ICT facilities, hardware, software, and instruction handbooks, so more facilities are needed. Third, learning in a small group or a club should contain of members of the same age and include Education learning and self learning tools such as CAI. Fourthly, methods should be mixed and convenience, time and good advisors should be considered.

5.3.2 Implications of the study

Most research about the use of ICT that has been published today mentions only ICT for current educators or has been confined to limited research conducted on specific senior persons and their use of ICT. This research chose case studies of senior educators in Thailand, a specific career of lecturers who need to use ICT at higher levels than others in the same age group and aims to investigate their use of ICT. Therefore,
it is important that the results be relevant and able to contribute to education in Thailand. It involves research and literature on how ICT can be implemented for education. This will be potentially important for both themselves and the education system.

This study reveals the importance of providing ICT training and support for senior educators to ensure they remain active academics and are a valuable resource in the education system. It recommends that basic computer literacy and software applications, for example, Windows and its main functions should be taught to Thai senior educators in the initial stages of their ICT training. More specific software and other ICT tools should be introduced according to the needs of the particular groups. It should show the benefits of ICT and illustrate how it can help them achieve their professional goals because as they learn more about ICT, they will realize what other aspects they need to learn and how they can apply to them. This will motivate them to learn and make it easier for them to choose what devices and software tools are suitable or what they need to learn first. This concurs with a Bangkok UNESCO report that states:

"Training programs should always start with an introduction of the rationale and purpose of using ICTs in teaching/learning, the role of teachers in the new ICT environment and how they can benefit from the use of ICTs, even before the technical aspect is given. Experience in certain countries has shown that without the motivational push, teachers do not bring back what they have learned into classroom application."

(UNESCOBKK.org, 2006)

Hardware and facilities to support educators to use ICT are also suggested in this study and cost should be taken into consideration too. A computer was acknowledged by the majority of Thai senior educators as a necessary ICT device to help in attaining their professional goals. The Government of Thailand has launched the “ICT Computers for Thais project” providing low-cost computers to low and middle income families, students, and civil servants (Thairath.co.th, 2004). However, there should be a similar project for senior educators as well. The Internet is also very useful but, the costs of Internet facilities and service fees in Thailand are still a worry and can hinder its use. Senior educators need to be provided with opportunities to use the Internet and to play with and become familiar with its benefits to be encouraged to use it. This can be conducted by providing login accounts from their faculties to access the Internet from their homes. Once they are familiar with it, some may decide to shift to high speed
Internet Broad band or pay more to take advantage of more functions to enable them to handle their future needs.

The policy and planning to encourage people to use ICT should support Thai senior educators' needs as well. Tinio (2003) suggested that to implement ICT for education, policy and planning have to concentrate by demarcating both drivers and hinderers for current institutional practices and arrangements and consider the financial resources needed to prepare to support the projects. For this study, the Thai Government and institutes should take these points into consideration as well. Forming the policy and the regulations also mention authorities have to support senior educators providing financial resources for the long term. Budgets need to be prepared regarding promoting ICT to support training courses and the staff finding sponsors who will support them is an alternative way to get financial backing.

The best way for senior educators to learn ICT should not use only one method. Even though this study indicates that Workshops in small group training with one mentor in each group is the most preferred way, there are advantages from other methods as suggested by many participants. Therefore, to enable learning to take place, "mixed learning" is recommended and taken into consideration by course developers, teaching aid designers, teacher trainers and people in organizations concerned with these groups. In addition, the results of this study mention the learning style called "Edutainment" a system which can enhance motivation to learn ICT. It can be arranged in the form of a club or a society in a friendly environment which includes entertainment and knowledge. Mixed learning allows various learning methods and should be provided during club activities. Small workshop training with a tutor who can give advice to each group and self-learning by giving opportunities to practise with facilities that can support them should be organized. Using new technology such as projectors, wireless teaching tools, or CAI to support these particular settings will help them become familiar with the technology they are learning in the course. However, the report of ICT in education by UNESCO BKK.org (2006) also suggested providing instructional books, another good way to facilitate learning ICT. This study also agrees with this particular issue as many Thai senior educators mentioned that they prefer to learn or practise by this method. Learning in a small workshop with their friends and with a mentor, they gain both education and entertainment. To practise lessons learned before workshop training by using instructional books will allow them accumulate lessons rather than starting from zero and it will mean they will not miss contexts after
the class. Therefore, more than one method should be used and a variety of programs should be provided to cater for the learning styles of the class so that no one is left out without a way to learn that suits them.

To this end, it can be clearly seen that Thai senior educators' use of ICT provides benefits to them and also to education if it can be implemented but to succeed, certain factors need to be taken into consideration and must be cooperation from the Government and from organizations who have a duty to support these particular groups of people.

5.3.3 Limitation of the study

No one method can satisfy all the needs of the researcher (Hawthorne, 1992) therefore, he/she has obviously to concern him/herself with the scope and limitations of the study. This research is also limited by several factors that mean the results will not be the same if repeated with different groups.

First, the study was conducted with Thai senior educators in universities in Bangkok, Thailand who are 60 or above, as it regarded sixty as the official age for retirement of Thai public servants. If it were conducted with people in other careers or people who are not in the retiree group, the results would not necessarily be the same.

Second, the study was limited to Bangkok where ICT facilities in Thailand are at present very good compared to the provinces. The findings may not be generalized to other Thai senior educators in other parts of Thailand or other countries where the technology and the use of ICT may be different.

Third, new technology has been rapidly developed in today's societies, therefore, many ICT devices and software tools are being presented to support education. This research did not cover all aspects of ICT around the world and did not include any discussion of forthcoming products. This study, therefore, focused only on ICT that is currently being used in the educational field in Thailand.

Fourth, although this study has attempted to determine current ICT knowledge and awareness, past experience with ICT as well as support provided in professional development may have had an effect on results.
5.3.4 Recommendations for further study

This section consists of recommendations for further study as suggested by the present study.

First, this study was limited to the investigation of the use of ICT by Thai senior educators who live in Bangkok and the surrounding provinces where ICT facilities can be supported and the demand is higher than in other places in Thailand. It might not be similar if a study of the same topic were undertaken in other provinces in Thailand where the use of technology is less extensive than in the capital city. As regards to other countries where there are different geographic, economic and cultural demands on the use of ICT, obtaining results on this issue would require additional research.

Second, this is a pioneer study that concerns Thai senior educators and their use of ICT, whereas previous research has been done on senior people or concerned only general educators, therefore, it covers only one perspective of research regarding senior educators in Bangkok, Thailand. It does not focus on senior educators in each specific academic field or each county. These people may different uses of ICT according in their skills, experience, and needs. Much further study is required to investigate their use of ICT.

Finally, the results of this study reveal interesting and useful information regarding the use of ICT by Thai senior educators. Hopefully, this might be the starting points for further researchers, course developers and teaching aid designers to use in designing training courses and creating teaching models for experimental research later on.
REFERENCES


Campbell, P. (2002). The older generation and the European information society: Access to the information society (Final project report): Activity Center ISA and Promotion Office ISPO.


technology in schools and colleges. *Journal of Information Technology for Teacher Education, 8*(1), 51.


APPENDIX A

Glossary of terms
Glossary of Terms

Thai senior educators / senior educators: The sample group in this research consists of Thai lecturers in universities aged 60 and above who are working full-time, part-time or those who have retired but still have the desire and ability to work and contribute to society. The samples were taken from selected senior university educators living in Bangkok. The term “Thai senior educators” in particular may not refer to all Thai senior educators, rather only to those for whom a similar set of circumstances as the participants in this study applies.

Professional life: In its general meaning, professional life means a career in industry, commerce, or professional activities (Farlex, 2004). Professional life in this study refers to the activities that have made them professionals based on their experience and involves educators who have been researching and teaching. It includes both academic and research activities.

Academic activities: The present activities of educators in their work, for example, teaching in a school or tutoring.

Research activities: The present activities of educators or researchers that involve the systematic investigation, including research development, testing and evaluation, designed to develop or contribute to general knowledge. In this study research refers to the activities that educators have been undertaking in order to support their professional life in educational fields both in and out of school time, and perhaps all their life.
APPENDIX B

A copy of the questionnaire survey (English translation)
QUESTIONNAIRE SURVEY

Dear ............................................................

You are invited to participate in this survey “An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand”, part of the requirements for Doctor of Information Technology degree.

This survey will take approximately 30 minutes to complete and the study concentrates on how senior Thai educators use ICT to attain their professional goals and goals in their academic life. You are a senior Thai educator who has been chosen at random to participate in this study.

The purpose of this survey is:
1. To explore your beliefs in using ICT for your professional goals.
2. To explore your attitudes in using ICT to achieve your professional goals.
3. To explore the level of your needs of ICT in your academic life.
4. To explore what ICTs are suitable to support your goals.
5. To explore the best way of learning how to use appropriate ICT in your life.

The information from your comments will be used to complete a Doctoral student thesis. Your participation in this study is completely voluntary. You may decline altogether, or leave blank any questions you do not wish to answer. The Approximately 10 respondents who have provided meaningful comments, interesting data and a range of opinions will be selected for an in-depth interview. There are no risks to participation beyond those encountered in everyday life. Your responses will be confidential and the data from this research will be reported only in the aggregate. No one other than the researcher will know your individual answers to the questionnaire and the interview.
If you agree to participate in this survey, please complete the questionnaire and return it as soon as possible in the enclosed reply envelope. Respondents who provide a successfully completed questionnaire will receive a copy of the summary of research results from the researcher when the study is finished. Your help will be very much appreciated.

Thank you for your time and co-operation

If you have any question about this study, please feel free to contact the researcher at:

Nattavee Utakrit: the researcher
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia
Personal telephone: 
E-mail address: nutakrit@student.ecu.edu.au
Introduction

This questionnaire includes 5 sections as follows;

Section 1: Your profile
Section 2: To explore your beliefs in using ICT for your professional goals
Section 3: To explore attitudes in using ICT to achieve professional goals
Section 4: To explore the level of your needs of ICT to achieve your academic goals
Section 5: To explore what ICT is suitable to support your goals
Section 6: To explore the best way of learning how to use appropriate ICT in your life.

Section 1: Respondent profile

Please put a check mark (✓) in the box that you choose or write in the spaces provided

Sex  □ Male  □ Female
Age  ..........  

1. What was your last or current educational position?
   □ Professor  □ Associate Professor
   □ Assistant Professor  □ Lecturer
   □ Other (Specify) ...........................................

2. Do you think your current skills and abilities can continue be used to support your work in your professional life?
   □ Yes  □ No  □ Not sure
3. Will you keep working to support your professional life? If yes, please describe your professional goals.
   - Yes (please describe below then go to Question 4)
   - No (then go to Question 7)
   - Not sure (then go to Question 5)

   Your professional goals are
   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................
   ..............................................................................................................................

4. How long do you think you want to continue to work?
   - 1-5 years
   - 6-10 years
   - As long as I can
   - Do not want to work (then go to Question 7)

5. Which of these activities are you currently doing that involve your educational skills and abilities? (Check more than one if applicable)
   - Classroom lecturer
   - Instructional Aid design and development
   - Curriculum Specialist
   - Special Education Lecturer
   - Administrator
   - Researcher
   - Academic writer
   - Consultant
   - Others (Specify) .................................................................

6. Which of these activities do you intend to do in the future? (check more than one if applicable)
   - Classroom lecturer
   - Instructional Aid design and development
   - Curriculum Specialist
   - Special Education Lecturer
   - Administrator
   - Researcher
   - Academic writer
   - Consultant
   - Others (Specify) .................................................................
7. Do you use ICT in your work time?
   □ Yes □ No

8. Do you have a computer with Internet access at home?
   □ Yes □ No
   □ No, but I access in workplace / friend's house or other places

9. Do you have a personal email account (excluding your institute email account)?
   □ Yes □ No

10. If yes, (for Question 3) do you use your email account to communicate with...
    (check all that apply)
    □ Family □ Students
    □ Administrators □ Other teachers at your institute
    □ Professional associations □ Other teachers not at your institute
    □ Other (Specify) ... □ Never use an email

11. Would you be willing to participate in an in-depth interview after the questionnaire has been analysed.
    □ Yes □ No

Please complete the details below so that a summary of the research results can be sent to you and so that arrangements can be made for the in-depth interview.

Name: ___________________ Surname: ___________________
E-mail: _____________________
Address: ________________________________
                               ________________________________
Telephone number: _______________
Section 2: To explore your beliefs in using ICT for your professional goals

In Questions 2.1 - 2.4 please put a check in the number beside each statement that most accurately reflects your view.

5 = strongly believe  4 = believe  3 = neither believe nor do not believe  2 = do not believe  1 = strongly do not believe

<table>
<thead>
<tr>
<th>Question</th>
<th>Statement</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>How much do you believe that ICT assists in the accomplishment of your professional goals?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using ICT can save working time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using ICT increases working convenience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using ICT enables work to be done more efficiently</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Using ICT increases work capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2.2      | How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals? | 5 | 4 | 3 | 2 | 1 |
|          | Using ICT enables you to design your own educational aids |   |   |   |   |   |
|          | Using ICT you can customize your own resources to support your teaching |   |   |   |   |   |
|          | Using ICT allows you to follow your students' progress |   |   |   |   |   |
|          | Using ICT allows you to communicate with other people easily |   |   |   |   |   |
|          | Using ICT enables you to be inspired and motivated by new and innovative methods of learning |   |   |   |   |   |
|          | Using ICT can result in improved learning and teaching |   |   |   |   |   |
|          | Other (Specify) |   |   |   |   |   |
2.3 How strongly do you believe the following statements obstruct you in using ICT for your professional goals?

Do not own / have ICT facilities or devices
Afraid / lack confidence to use it
Costly
Have tried but did not enjoy it
Have a disability that makes it difficult
Have no interest
Not enough time
Other (Specify) .............................................

2.4 How strongly do you believe the following statements would encourage you to use ICT in your professional goals?

Better learning / education facilities to help me learn ICT
If I had more time
If costs were reduced
If it were a more convenient way to learn ICT
If it would expose me to more education facilities
If I had someone to train me
Other (Specify) .............................................

2.5 Once you are familiar with using ICT, do you believe it will help you to achieve your professional goals more easily?

☐ Yes ☐ No ☐ Not sure

2.6 How much do you believe using ICT can help you to achieve your professional goals?

☐ Very much ☐ much ☐ not much ☐ do not know
2.7 If you have an opportunity to use ICT, for example, a computer, the Internet, 
or PowerPoint presentation programs, would you like to try them?

☐ Yes  ☐ No  ☐ Not sure

2.8 Do you believe that ICTs benefit current educational societies?

☐ Yes  ☐ No  ☐ Not sure
Section 3: To explore your attitudes in using ICT to achieve professional goals

Please put a check (✓) in the number beside each statement that most accurately reflects your view.

5 = strongly agree  4 = agree  3 = neither agree nor disagree
2 = disagree  1 = strongly disagree

<table>
<thead>
<tr>
<th>Direction: Indicate how much you agree or disagree with the following statements.</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Computers and the Internet now play great roles in education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. ICT is only suitable for younger people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Everybody should know how to use a computer and the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Educators should know how to use computers and the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Using ICT helps me to gain more skills, experience, and better performance in my profession goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. ICT will provide more advantages for my professional life than disadvantages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I am quite familiar with using ICT in my professional life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. ICT is not hard to use if I have a good advisor to guide me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I should not fear using ICT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The computer and the Internet are important in supporting my academic goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 4: To explore the level of your needs of ICT to achieve your academic goals

Please put a check (✓) in the number beside each statement that most accurately reflects your view.

5 = strong need  4 = need  3 = uncertain  2 = not needed  1 = definitely not needed

<table>
<thead>
<tr>
<th></th>
<th>Direction: Indicate your level of need to the following statements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I need to use ICT such as the computer and the Internet to support my academic life</td>
</tr>
<tr>
<td>2.</td>
<td>I need the benefit of using ICT to help me achieve my academic goals</td>
</tr>
<tr>
<td>3.</td>
<td>I desire to use ICT to help me achieve my professional goals</td>
</tr>
<tr>
<td>4.</td>
<td>I need my own computer at home</td>
</tr>
<tr>
<td>5.</td>
<td>I need to access the Internet from home</td>
</tr>
<tr>
<td>6.</td>
<td>I need to keep my work and paper documents in my hard disk or CD ROM so that I can easily find and use them later</td>
</tr>
<tr>
<td>7.</td>
<td>I need to use email to communicate with my colleagues</td>
</tr>
<tr>
<td>8.</td>
<td>I need to use email to communicate with my pupils</td>
</tr>
<tr>
<td>9.</td>
<td>I need to prepare my lesson by PowerPoint program</td>
</tr>
<tr>
<td>10.</td>
<td>I need ICT to support me to achieve my academic goals</td>
</tr>
</tbody>
</table>
Section 5: To explore what ICT is suitable to support your goals

Please put a check (✓) in the box that you choose or write in the spaces provided.

5.1 How suitable are the following tasks in supporting your personal goals?

5 = very suitable  4 = suitable  3 = neither suitable nor unsuitable
2 = unsuitable  1 = definitely unsuitable

List of online tasks

5 4 3 2 1

Searching for information on websites
Using a search engine to seek information
Creating a webpage
Transferring photos or data to other persons
Checking email
Checking a time schedule
Making educational arrangements
Need more directions
Posting messages on the web board
Buying something via e-commerce
Registering information
Using VDO streaming, Watch movie or news
Discussing or chatting with other persons
Others (Specify) ...

174
5.2 How suitable is using a computer for the following professional tasks?

5 = strongly suitable  4 = suitable  3 = neither suitable nor unsuitable  
2 = unsuitable  1 = strongly unsuitable

<table>
<thead>
<tr>
<th>Task</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep records such as grades and attendance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word processing of test, handouts, other materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare lesson plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present lessons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitate project-based learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with students and parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with your colleagues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with administrators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participate in online professional development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search information for your students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct student assessments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek peer-to-peer advice and counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.3 How often do you use these ICT devices to achieve your goals?

- (5) many times a day
- (4) many times a week
- (3) once or twice a week
- (2) once or twice a month
- (1) rarely used
  - N = Never
  - D = Do not know

<table>
<thead>
<tr>
<th>List of ICT devices</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptop Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Phone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDA (Personal Digital Assistance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Camera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD Burner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television, VDO, VCD, or DVD Player</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Webcam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.4 How often do you use these software tools to achieve your goals?

(5) many times a day
(4) many times a week
(3) once or twice a week
(2) once or twice a month
(1) rarely used
N = Never
D = Do not know

List of tool software

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Computer-aided instruction (CAI)
- Spreadsheet such as Microsoft Excel program
- Word processor such as Microsoft Word program
- Software presentation such as PowerPoint Presentation program
- Graphics and multimedia such as Adobe Photoshop program
- World Wide Web browsers
- Calculations program such as SPSS for Windows
- Search engines such as Google.com
- Others (Specify) ...........................................

6. Have you heard of any other ICT device that might help you improve your personal and academic skills?

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
Section 6: To explore the best way of learning how to use appropriate ICT in your life

Here are five scenarios that describe methods you could use to learn how to use appropriate ICT.

<table>
<thead>
<tr>
<th>Scenario No.</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Workshop by a lecturer in front of the class</td>
</tr>
<tr>
<td>2</td>
<td>Workshop by peer to peer training in groups with one peer and one trainer in each group</td>
</tr>
<tr>
<td>3</td>
<td>Workshop in small group training with one mentor in each group</td>
</tr>
<tr>
<td>4</td>
<td>Self learning by using E-learning or with CAI</td>
</tr>
<tr>
<td>5</td>
<td>Learning from an instructional book</td>
</tr>
</tbody>
</table>
From the above scenario methods, which one do you believe that will be the best way for you to learn ICT? (Please write down the scenario number that you choose in the space below)

Answer: Scenario number ..................

Why do you believe this would be the best method for you?

What other methods would you like to use to learn about ICTs?

End of the questionnaire.

Please accept my grateful thanks for filling out this survey. I value the time and effort you have made. If you have any suggestions or comments to make about the survey, please use the space on the back of the sheet to record them.
The semi-instructional interview form

This semi-instructional form was used as a guideline in in-depth interviews after the questionnaire survey had been completed. It will attempt to obtain greater depth of information on the research topic and act as a supplement to data from the questionnaire as there may be additional questions that arise out of the analysis of the questionnaire data.
Semi-Structured Interview form

This Semi-Structured Interview form for in-depth interviews will be used to obtain more information to support the study, "An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand", as part of the requirements for Doctor of Information Technology Degree.

The interview aims to investigate and recommend the best ways of learning how to use appropriate ICT for senior Thai educators. It will take about 30 minutes to complete and a tape-recorder will be used to collect the data.

1. Please give details about your life after retirement from your institute. What is your job now? How many days do you work a week?

Comments:
2. What ICT facilities do you use to support your goals and why do you believe they will help you to achieve your goals?

Comments:

3. How comfortable or how familiar are you when you use these ICT devices to support your goals?

Comments:

4. What obstacles were there for you when you first used these ICT? How did you become familiar with them?

Comments:
5. What other appropriate ICT do you think you need to support your goals and why do you think they are needed?

Comments:

6. If you do not know how to use them, how can you learn to master them?

Comments:

7. Which way do you think is appropriate to learn the use of ICT for your life?
8. There are five scenarios that describe methods you could use to learn how to use appropriate ICT.

**Scenario 1:**
Workshop by a Lecturer in front of the class

**Detail:**

**Scenario 2:**
Workshop by peer to peer training in groups with one peer and one trainer in the class

**Detail:**

**Scenario 3:**
Workshop in small group training with one mentor in each group

**Detail:**
**Scenario 4:**
Self learning by using E-learning or with CAI

**Detail:**

**Scenario 5:**
Learning from an instructional book

**Detail:**

From the above scenario methods, which one do you believe that will be the best way for you to learn ICT?

Why do you choose that method?

Comments:
What steps should be taken for people who want to develop or investigate ICT training to assist senior educators in the future?

Comments:
APPENDIX D

The list of experts
The lists of experts

The content validity of the research tools were checked by experts who are specialists able to make comments on and give feedback about the research tools. Their names are listed as follows:

1. Asst. Prof. Dr. Tungrat Sriwongkol
   Ph.D. (Instructional Design/Development)
   University of South Alabama, U.S.A.

2. Assoc. Prof. Dr. Krismanth Whatananaong
   Ph.D. (Vocational Education - Instructional System Technology)
   University of North Texas, U.S.A.

3. Assoc. Prof. Dr. Kantla Phunlapthawee
   Ph.D. (Quantitative Research, Evaluation, and Measurement in Education)
   Ohio State University, U.S.A.

4. Dr. Phayung Meesad
   Ph.D. (Electrical Engineering)
   Oklahoma State University, U.S.A.
   M.Sc. (Technical Education - Electrical Technology)
   King Mongkut's Institute of Technology North, Bangkok, Thailand

5. Piyachon Chokpipat
   M.A. (Evaluation, and Measurement in Education)
   Chulalongkorn University, Thailand
APPENDIX E

NVIVO Models of the interviews
NVIO Model of the In-depth interviews
APPENDIX F

Interviewees' transcripts
Interviewee A: a former university vice president, 62 years old. Female

Personal details

Work status

Question: Good morning, Mrs... May I interview you in more detail? According to what you told me, you have already retired, however, you are still working aren't you?

Answer: Yes, I teach at Master Degree level.

Work details

Question: Is your job similar to the jobs you did before retiring?

Answer: Some are similar. Before retired I was Head of the Master program and was an advisor and a member of the Thesis committee.

Motivation

Question: What motivates you to work even though you are already retired?

Answer: I love being a teacher so much. When I just graduated, I worked for international organization and my family and I had many chances to go aboard for work and study. I obtained a great deal of knowledge and experience from this and I would like to share my experience with other people and my students. I would like them to have an opportunity like me and would like to see them to be good members of society.

ICT Facilities

Question: Does your job now have any relationship with ICT?

Answer: Yes it does. Actually, I am not really good in using ICT, medium level using only simple ICT facilities such as email, and searching for information from the Internet for my teaching. However, I have noticed that ICT provides significant assistance for us and I would like to encourage other people to use it.

Familiarity

Question: Do you ever use a software program such as PowerPoint?

Answer: Not very often. I have my TA prepare the PowerPoint for me. I am not good at using it.
Learning ICT

Question: Right, at first how did you learn to use ICT?
Answer: At my university I had training courses but I still do not have good skills.

Question: What kind of training course did you attend?
Answer: Workshop training

Question: How many people were there in the class?
Answer: It was quite a large workshop. There was one expert in front of the class and other mentors helped.

Appropriate ways to learn ICT

Question: In your opinion, which method do you believe is the best way for you to learn ICT? Why do you choose this method?
Answer: I think workshop training would be good because we can do it by ourselves at that time. To learn from instructional books or CAI alone may be very slow especially for older people. There is a group of people to teach older people how to use computers and the Internet. The members of this group are all older people. They not only provide the knowledge but they have activities to entertain older people. These will help older persons to overcome the fear of the computer and make them not feel lonely. Older people who have been trained by this group can talk about IT with their children at home and will not feel out of date.

Question: That means there are regular activities and they must be special for older people. Are they different from normal training?
Answer: Yes and the participants are the same age.

Question: And they still need to use ICT too.
Answer: Yes, because some people have to contact people in other countries.

Question: Today which ICT resources have you used?
Answer: Normally, I ask my staff to do for me. I am a user.
Other suggestions

Question: Finally, if there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think this is a good idea?

Answer: We must understand that the nature of older people is they may be slow. They know ICT is important but they are still slow.
Interviewee B: a former university lecturer, 60 years old, Female

Personal details

Work status

Question: Good afternoon, Mrs.... May I disturb you for a short time? First of all, I would like to thank you so much that you returned your questionnaire. From your questionnaire, I see that you have already retired however, you are still working, aren't you?

Answer: Yes, a little bit.

Work details

Question: What do you do?

Answer: I am a ... advisor for an industrial company and advise on students' projects. I do not teach any more after retiring because the university requires a degree for lecturers who can remain teaching but I do not have one.

Motivation

Question: What motivates you to work even though you are already retired?

Answer: Whatever I have learnt I would like to let the other people know as well. I do not want to keep it only for myself. Another thing is I believe in that if we give our knowledge freely, then we will receive good things back.

ICT Facilities

Question: Are there any ICT facilities where you work?

Answer: Actually they are related to my work. For example, if we want to know anything we can search it from the Internet. However, I seldom use his kind of tool, I use email but not very often. I like email to communicate with other people to get the information about travel. I travel to abroad every year. Actually, it is not too difficult if we learn but I do not have my own computer to practise, for at home it belongs to my grand daughter and she uses it everyday. This means if we do not use something regularly, we will forget how to use it.

Chatting by using a chat room on the World Wide Web, for example
Microsoft chatting rooms, is good because there are interactive activities for people of the same age. In fact, people of the same age never or hardly ever do this. I do not think other ICT is used very often if senior educators come from other fields such as the Humanities.

**Other ICT**

**Question:** What about searching information from the World Wide Web?

**Answer:** I personally use Google but I would like to tell you, I am not good because I know very little about it. I do not understand about downloading or printing out. However I think I will try to learn and I would like to attend classes. The problem is I have no time but I advise other people to go to learn it.

**Familiarity / Learning ICT**

**Question:** It seems like you are familiar with ICT, how did you learn to master it?

**Answer:** A little bit. The reason I have to use it is because first, I do not want to disturb the children to do something for me. The quality of work from them is not good enough, the format is bad and I have to correct it regularly again by myself. That’s why I began to learn. I think I should learn more things and as I have a science background, I would like to seek more knowledge. Everyday I listen to the news from the radio about issues that are interesting such as economics, and technology updates. Some day the programmers invite software developers to talk about management and how to apply IT into business. I like this.

**Question:** May I ask you first time you used ICT did you learn to use it by yourself or did you go to a workshop or course?

**Answer:** I hardly ever take training courses. However, I remember the first time I used IT was in 1992. At that time I used a word processor to report on science projects and some calculation programs to analyse the results from questionnaires. I had to find which way was the most
convenient without other people doing for me and that way was asking people how to use it. For example, how to turn things on, how to print out, how to make a table. Then I wrote it down step by step in my notes. I tried to use it by myself and when there were problems, I phoned to ask. Therefore, on my monitor, I put short notes around. I like to learn by myself and then ask the people. I do not like to open a text book because I think the book sometime is not clear and it is hard to understand. The authors sometime used specific words that are understood by themselves or people who have knowledge. This is the reason I do not use the book. When Microsoft 3.1 software arrived, there was a training course and I was trained. I learned to follow the menu and whenever I got problems, I asked experts. I was also trained in PowerPoint presentation too but I know only a little because I rarely use it. Excel I use regularly because I have to prepare financial documents and I sometime ask my staff and then practise by myself later on.

**Appropriate ways to learn ICT**

**Question:** For senior people who want to learn ICT which way do you think is suitable?

**Answer:** There is a club for older persons in Thailand which has been set up to train them to use computers and the Internet. Some older people have learnt ICT and now they have many friends on the Internet and they can also teach other older people to use ICT. So it depends on a person's interests. If we also think we are silly, we will never be familiar with it. If we do not think like that, we may be able to learn. We have to practise many times and if there is any problem, we have to ask an expert.

**Question:** What about learning from CAI?

**Answer:** I think it is a good idea but it may be slow. We have to understand the learners' skills. If they do not have any, we must balance them. I remember the first time I was trained in PowerPoint. Some lecturers taught based on their understanding. They did not give the reasons why they did this. I could not remember. If they explained, it would
be very so helpful, not only for senior educators who had never used ICT, but also for the young people. It is pity.

**Question:** What about training courses for older people? Should they be in a big class or in a small group?

**Answer:** It does not matter, a small or big group, but the thing is, and we must balance the skills of the learners. Second, if we do not balance their skills, we have to pre-test them and then put them into the right level. Finally, it is necessary to provide the correct number of tutors or TA's may be 3-10 people a class or sometimes 1 tutor per student.

**Other suggestions**

**Question:** Finally Do you have any suggestion for the researcher in this particular issue?

**Answer:** I am not sure, but I think the other interviewees may have given you some ideas already. For me I can just say that I am interested in ICT.
Interviewee C: a former university lecturer, Asst. Prof, 60 years old, Male

Personal details

Work status
Question: From your questionnaire details, I see that you have already retired however, you are still working, aren't you?
Answer: Yes, I am

Work details
Question: What is your job about?
Answer: I am a part-time lecturer, a trainer, and work for the financial department in my university.
Question: Is your job similar to the jobs you did before retiring?
Answer: There are some things similar for example, being a lecturer, and an advisor for the new colleges.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I still have enough energy therefore, if there is anything helpful that I can do for society, I am happy to do it.

ICT Facilities
Question: Does your job now have any relationship with ICT?
Answer: Good question. I use the Internet everyday because I know that technology has improved rapidly and I have to catch up. The information updated from the Internet can be applied and used for my academic work.

Familiarity
Question: How long have you been familiar with ICT?
Answer: I had to read reports related to this particular issue while I was an administrator for 12 years, a vice president for 9 years and the Dean of the Faculty for 3 years.
Question: That means you were an administrator for almost 10 years. May I ask you how you became familiar with ICT?
As I told you, technology and science have improved rapidly so we need to catch up. These things are linked together.

Learning ICT

Question: Normally, older people whose ages are similar to you are not much interested in technology, but you are different. Did you learn it by yourself or did you learn from somewhere?

Answer: I was trained. I also like to seek for new information and knowledge from the Internet rather than go to a library.

Difficulties in learning ICT

Question: As you are familiar with ICT, do you have any problems or what difficulties do you experience when you use ICT?

Answer: Mainly, I learn by myself. It was learning by trial and error. Sometimes I learn from textbooks or instructional books and by asking experts. I am not expert in these things just medium level. I am a user, I am working in the education fields and am not good at IT, so the problem is my computer skills are not good. This is an obstruction for my work.

Question: To use ICT, these should be facilities to support, shouldn’t these? Where do you use these things?

Answer: There are many things. For example, I have a Login name from my university to connect to the Internet.

Appropriate ways to learn ICT

Question: If we have to encourage senior people to use ICT, in your opinion, how can it be done or what methods do you believe are the best for this group of people to learn ICT and get benefits from it?

Answer: I would like to give an example. Nowadays, adult education, life long learning, or education related to older people have been already put into the Government policies (1999-2002). Therefore, if we practise regularly, we will not forget it. However, for senior people to encourage them to use ICT, education should be taken into consideration. That means to encourage them we will have to include two things;
I knowledge, 2 entertainment.

Question: So which method should be suitable for them?
Answer: Every method is suitable. The computer provides new things for us to learn.

Question: Do you have any suggestions to make in this particular issue?
Answer: A training course is not bad because it has two way communications for while adult are learning with their friends, they will feel entertained.

Question: What size would be good, a big group or a small group?
Answer: Both are ok

Question: If there is a researcher who would like to develop teaching aids for senior educators to learn ICT, do you have any suggestion?
Answer: It depends on personal interest. We have to study how necessary ICT is for them. The study does not need to focus on only senior educators, it can be any older person. Another thing is we have to provide facilities for them such as user name and passwords to logon the Internet.

Other suggestions

Question: Finally, do you have any suggestions for the researcher in this particular issue?
Answer: Today, technology has many facets, but how can we merge them and encourage people of every age to realise its benefit. This is the important point. The Government should have a policy to encourage people to learn about ICT otherwise we cannot compete with other countries.
Interviewee D: a former university lecturer, Asst. Prof, 62 years old, Female

Personal details

Work status
Question: From your questionnaire, I see that you have already retired however, you are still working, aren't you?
Answer: Yes, I am. I still teach regularly as a part time lecturer at 3 universities.

Work details
Question: What motivates you to work even though you are already retired?
Answer: I like to work and learn new things.

ICT Facilities
Question: Does your job now have any relationship with ICT?
Answer: We use it as a tool. This means if we have a class we have to prepare PowerPoint. If you ask me if I prepare it by myself or not, the answer is no. I have done it by myself only a few times and now I have nearly forgotten how to do it. My family helps me.

Question: You prepare the content and ask other people to do the PowerPoint, do you?
Answer: Yes, I have no time to do it. However, I add more details sometimes.

Question: Have you ever searched for the information from the Internet?
Answer: Yes I have. When I want to know something, I will look at the Internet.

Learning ICT
Question: Where did you learn to use ICT?
Answer: Actually, there were courses but my free time did not allow me to attend very much. I was trained once or twice but some I didn’t use it. For example, I learnt Excel but I didn’t use it. PowerPoint, I have used a little bit. The courses were short courses about half a day for 2-3 days. All the at I learned by myself. I have text books but never use them. I learn by my trial and error. Even though I want to learn, I could not follow them because there was only 1 lecturer in the class.
and it was inconvenient to ask. If I ask friends in class, it may not be a good thing because it will disturb their time. Therefore, it seems I did not really learn. Excel I cannot use but PowerPoint I know a little.

Question: What kind of training course did you attend?
Answer: It was a large group about 30 people and we had to learn at the same time. The lecturer taught and used PowerPoint but I did not have the basic skills.

Question: Was there any mentor?
Answer: There was one mentor.

**Appropriate ways to learn ICT**

Question: If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?
Answer: I think it would be useful. Actually, I have many books both in English and in Thai but they are not attractive to learners. It would be good if they were more attractive.

Question: Between that kind of CAI and organizing a workshop or course in small groups, which one would be suitable for senior educators?
Answer: I will not choose to learn by only one method because learning in a group with other people such as younger people will cause the class to run slowly. As I am a bit slow, learning by oneself with instructional books is good because I can learn without any time limited and do not disturb other people. However, older people normally stay alone so to learn in a group, older people will have friends and not feel lonely because they can talk with other senior people. Therefore, I will choose the middle way, e.g., using multi methods.

**Other suggestions**

Question: Finally, do you have any suggestions for the researcher in this particular issue?
Answer: I am sure, it is useful.

Question: Are you still interested in ICT?
Answer: Yes, I am and I think other senior people will think the same as me. Don't forget to make it attractive with sound and movies these would be good.
Interviewee E: a former university lecturer, Asst Prof, 63 years old, Male

Personal details

Work status

Question: May I interview you in more detail? After retiring do you still work in the academic field or not?
Answer: After retiring, I taught for 3 years. Now I have just stopped my teaching, however, I will take it up again if I am required.

ICT Facilities

Question: At present, are you using any ICT facilities?
Answer: Mostly, I use email. I check my email addresses regularly. I had no computer background before and just began learning it when I was about to retire. I can now use PowerPoint to prepare teaching documents. My learning style is so simple. I was trained but I could not understand it. I have to learn by myself and then ask somebody, step by step and practice. When I have any questions, I ask. This is very fast learning and most suitable for older people. To learn based on theory and to teach from the very beginning is difficult because we have to remember everything. I tried it before and I did not think it was suitable for older people. For my style, I can go fast. Just tell me the steps, then I follow and when I have any questions, I will ask. I can learn how to use PowerPoint in a short time.

Learning ICT

Question: That means you mainly learn by yourself and you will ask when you have a problem.
Answer: I ask someone to tell me the steps and then I practise at that time. I am not like young people who can learn in the normal way very quickly.

Question: Did you use PowerPoint since before retiring and after retiring?
Answer: Yes, I can use it tolerably well. Usually, when I begin learning, I will take some short notes how to do it step by step. After that I will practice by myself. I sometimes search for interesting information from the Internet, then I will record it. This information is so useful for my teaching. Another important thing is I have to practice it.
everyday. Fortunately, when I was about to retire, there was a computer on my table at my office. I wanted to try it but I did not know how to turn it on, so I just asked other people how to turn on and off. After that, I have practised regularly and taken short notes. After that, I learnt how to use functions. Now I can use it and I also use email to contact my college. It is so useful for me.

**Familiarity**

**Question:** This means you are quite familiar with ICT, such as email, or PowerPoint.

**Answer:** I am a just medium user.

**Difficulties in learning ICT**

**Question:** Is there any training in ICT at your university?

**Answer:** Yes, but it was very hard to learn because it was conducted in a big group.

**Appropriate ways to learn ICT**

**Question:** Could you follow them?

**Answer:** I could but it did not understand very clearly. After that I needed to learn using my method that I told you about. I can go faster than my friends the same age group and learn in the normal way. I practise and when I have questions, I ask. For senior people, I think this method is quite successful and it is better than to learn from the beginning. Because we are old, we need to learn by short cuts. This is my understanding because I have tried myself and been successful.

**Other suggestions**

**Question:** Finally, if there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think is it possible?

**Answer:** As I told you, there are many ways to learn. Learning from the beginning step by step, the learners will know exactly, but for senior people, it is hard because they are rather slow. For me, this strategy was successful and I also advise other older people to learn in this particular way for I am sure they will enjoy success too.
Interviewee F: a former university lecturer, 62 years old, Male

Personal details

Work status
Question: From your feedback, I have know that even though you have already retired however you are still working in the academic fields are not you?
Answer: Yes I am.

Work details
Question: What is your work about?
Answer: I use a computer to develop computer software, create a website by using HTML, and am now writing 2 academic text books about computer application software.

Question: Do you have any class lectures?
Answer: I have stopped teaching for a while because I have to take care my grandchildren. However, when they grow up I may go back to teach again because my faculty is asking me to help them again. Whenever I have time, I will be back.

Question: That means you have used computers before you retired?
Answer: That is right. I am the person who creates and develops lot of software for my university.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I would like to transfer my knowledge, skill and experiences to the new generation as long as I can because if I keep them to myself, I will forget and the knowledge will be lost. Therefore, as I still can work, I do so and provide knowledge according to their requests.

Question: Where did you graduate?
Answer: I graduated in Physics and Mathematics from the USA in General Science. I had chance to take courses about computers while studying at the university. After graduating, I returned to Thailand and was trained for computer courses. After that I and my colleagues established the School of Computer Science in my university.
Familiarity

Question: It seems you are familiar with ICT and have been working in this field for a long time.

Answer: Yes, I have always used ICT. Even now I am still a chairman, a committee member, and advisor for student Master theses. When my students hand in the assignments, they will send them by email because we have to teach them about ICT so we have to know and use it too.

ICT Facilities

Question: You use the Internet and other ICT facilities as well, don't you?

Answer: Yes I do.

Difficulties in learning ICT

Question: What difficulties do you experience when you use ICT?

Answer: The problems are, first, the hardware is not updated. The updated ones are too expensive for us. The capacity of the computer is not good enough, the software licenses are not cheap, and maintenance costs are high. Secondly, the problems belong to users for they have different skill levels.

Learning ICT

Question: Have you ever organized training courses for ICT?

Answer: I do them regularly.

Question: Are you the trainer?

Answer: Yes, I am. Sometimes we invite lecturers from other sources.

Appropriate ways to learn ICT

Question: If there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think it is a good idea?

Answer: In my opinion, we have to look at the goals and see what they want to learn ICT for? Whenever the learners have goals and know what to learn, it will be a success. If not, they may be interested only at the beginning but after that they will become bored and not understand and not want
to learn any more. If we train people who are really interested, they will be likely to learn and become familiar with ICT. To sum up, the goals of the learners are important.

Question: Up to date, have you ever provided workshop training?
Answer: Yes

Question: How was it? Was a workshop by a lecturer in front of the class or a workshop for a small group of people with one tutor in each group, or anything else?
Answer: Normally, we set up a workshop with around 25-30 persons with one lecturer and 1-2 mentors

Question: Have you ever provided CAI for them? Is it possible to use CAI to do this?
Answer: It is hard because of several factors. For example, some people don’t know how to operate the computer. If we provide them with CAI, it will be very difficult for them.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?
Answer: We have to focus on the skills of the learners and their goals to use ICT. We still have to train them than let them learn from CAI alone. Sometimes we give them CAI but they never turn it on because they don’t understand or have no time, so it is useless. Therefore, the thing we have to do is to make them understand how to use and the exact significance of using ICT. If we train them, we must know how to encourage them to use it.

Question: So self-learning is still difficult for them, is it?
Answer: Self learning, the learners must have goals first. If we just give them CAI, they may not be interested. Like a student, the teacher must detail the objectives of learning for them, and then students will study.
Interviewee G: a former university lecturer, 60 years old, Female

Personal details

Work status
Question: According to your information, you have already retired however, you still are working.
Answer: Yes, I still teach at the university.

Work details
Question: Is your job similar to the jobs you had done before you retired?
Answer: After retiring, I have been a part time lecturer and Masters degree's advisor and also write academic text books.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I would like to provide knowledge from my experiences for all of my students. Now I am doing just that.

ICT Facilities
Question: Are there any ICT facilities where you work, and do you use them?
Answer: There is no direct ICT for my job, however, ICT supports educators to help them reach goals. For example, PowerPoint.

Familiarity
Question: Do you use PowerPoint regularly?
Answer: Yes, I do. I use it when I teach and all of my students also use it when they have presentations in my class. They can use it very well. The other technology besides PowerPoint we use is the e-Learning system to report and submit students' grades to the university. All lecturers have to do this. It is a rule of the school.

Question: That means all lecturers in your university have to use ICT?
Answer: It is compulsory.

Question: What about searching the information on the Internet?
Answer: Yes, I have used it. There is a lot new information on the Internet that I can use to reference my teaching.
Learning ICT

Question: It seems you are familiar with ICT. May I ask, how did you learn it?
Answer: I attended training courses at my university. The technology just came when we are old and about to retire. If we still have to work, why we not learn how to use it? We have to concentrate. I think 90% of the staffs in my university need to know how to use it.

Question: How are people trained?
Answer: Sometimes they invite other lecturers from outside even though we already have our own computer lecturers. There are about 30-40 persons in one class but numerous mentors to help us. The training courses have many levels, beginning from the basic level which has lots of students who have no skills or cannot operate the computer in the class and advanced levels where the classes are smaller. In the beginning classes may be larger.

Appropriate ways to learn ICT

Question: Do you think it is good to use CAI to help senior educators use ICT?
Answer: CAI actually is needed. Learning from CAI is not old fashioned it is especially useful for older people who live faraway from the city and find it inconvenient to travel. Therefore CAI is still important in my view.

Question: If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?
Answer: I strongly agree with this, especially for senior educators because we find that these groups of people still need to learn by themselves and it is sometimes not convenient to travel.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?
Answer: The researcher should consider that learners have many levels so the tools or teaching aids or training courses should be based at the level of the learners.
Interviewee H: a former university lecturer, Asst. Prof. 62 years old, Male

Personal details

Work status
Question: First of all, thank you very much for answering the questionnaire survey for me. Would you please let me interview you in more detail today? From your feedback, I know that you have already retired, however, you are still working in the academic field, aren't you?
Answer: Yes, I do but only 1 day a week. Um, I also am an advisor for a factory.

Work details
Question: Is your job similar to the jobs you did before retiring?
Answer: Not at all, but some things are similar. I apply my knowledge and experience to work for the factory.

Motivations
Question: What motivates you to work even though you are already retired?
Answer: Umm it so happens that is convenient. Everything is there so I like to work. I am a person who wants to teach because when I teach somebody else, I also practise and gain knowledge too. Another thing is, I am thinking of my students. I would like to provide them with knowledge. That is what I want to do.

ICT Facilities
Question: Are there any ICT facilities where you work and do you use them to support your goals?
Answer: Very much! I mean, there are lots but as I have told you, I am very bad at using these things even though I know they are very important and very necessary and that I should adapt myself to learning about them.

Question: Have you ever used any computer programs to support your work?
For example, PowerPoint.
Answer: I have never used it because I do not have many classes. When I teach I provide documents paper and worksheets for my students and
sometime use a pen to draw the structure of chemical formula on the overhead transparency. I am not sure if PowerPoint can do this thing or not.

Familiarily

Question: In your opinion, to help these people become familiar with ICT, what method would you suggest? For example, setting up workshop training programs, preparing instructional books, using CAL or e-Learning.

Answer: I think we should use several methods. To use only one method may not be successful. Anyway, the other thing is how to make it convenient for them.

Other ICT

Question: Do you still use a computer or the Internet?

Answer: This is my problem. I am too old but I think I would like to try. Actually I intend to try because it is necessary and I should know about them.

Using ICT

Question: In your university do most lecturers use ICT in their academic work?

Answer: Yes. They often use PowerPoint presentations because it is very convenient. It can be taken anywhere to the country and abroad. Many new lecturers have been using it.

Appropriate ways to learn ICT

Question: In your university do they provide any training courses on ICT such as computer training programs or not?

Answer: Yes, there is a section to organize this. The training course is still important.

Question: What is the course like?

Answer: There is training by a lecturer in the class and there are tutors helping too. They provide one student per computer because we have lots of computers in our university.

Question: Do they use ICT in long distant learning?
Answer: Not yet. It is not important because each person does not have much teaching.

Question: If researchers or course developers investigate ICT training aids or training course to assist senior educators become familiar with the use of ICT, what do you think this is a good idea?

Answer: Very good. I strongly agree with this because many senior educators who are already retired or are not yet retired still work or still have academic goals and no chance to use this particular technology. For me, I think it is very important for people who still want to be in academic fields.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?

Answer: Remember senior educators will use ICT whenever

1. They feel it is convenient
2. They have time
3. When they have an advisor.
APPENDIX G

Information letter to participant for In-depth interview (Thai version)
JIUMAN RESEARCH ETHICS COMMITTEE

For all queries, please contact:
Research Ethics Officer
Edith Cowan University
100 Joondalup Drive
Joondalup WA 6027
Phone: 6304 2170
Fax: 6304 2061
Email: research.ethics@ecu.edu.au

EDI.TH COWAN

หนังสือแจ้งวาระจะเกิดสั่งให้ผู้เข้าชมแบบสอบถาม และผู้ให้ข้อมูล

เรื่อง ขอความอนุเคราะห์ในการตอบแบบสอบถาม

เรียน

ที่ส่งมาถึงว่า 1. หนังสือให้ความอนุญาตว่าจะตอบแบบสอบถามเพื่อการวิจัย 1 ฉบับ
2. แบบสอบถาม 1 ฉบับ

สำหรับแผนสำนักงาน ศูนย์ผลิตภัณฑ์สุขภาพ มูลพิจารณา สาขาวิทยาการคอมพิวเตอร์และสื่อสาร

นางสาวนฤทธิ์ณัฐ ฉิมชัย ส่วนบริการวิจัย บริการวิจัย ประจำคณะสื่อสาร ขณะนี้กำลังรวบรวมข้อมูลเพื่อเป็นที่พ้นหนึ่งของการศึกษา ขอ
อนุญาตให้ใช้ข้อมูลเป็นที่พ้นหนึ่งของการศึกษา เพื่อเป็นข้อมูลสำหรับการวิจัยดังนี้

ชื่ออาจารย์ นางสาวนฤทธิ์ณัฐ ฉิมชัย ประจำคณะสื่อสาร

ชื่อผู้วิจัย นางสาวนฤทธิ์ณัฐ ฉิมชัย

ที่อยู่ School of Computer and Information Science, Faculty of
Communications, Health and Science, Edith Cowan University, Mt.
Lawley Campus, Western Australia

โทรศัพท์ +61 4 22586404 (เอกฉันท์) or +662 5891086 (โทรศัพท์)

อีเมล nutakit@student.ecu.edu.au

เหตุผลเกี่ยวกับข้อเสนอแนะ

เสนอข้อเสนอแนะเพื่อการวิจัยดังนี้ ผู้วิจัยจะเป็นผู้วิจัยของที่พ้นนี้
ที่มีชื่อเสียงดังนี้

1. เข้าศึกษาด้านคิดในในการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อสร้างเป็นนัก

2. เข้าศึกษาด้านคิดก้าก้านการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อสร้างเป็น

3. เข้าศึกษาด้านคิดก้าก้านการใช้เทคโนโลยีสารสนเทศและการสื่อสารที่มีชื่อเสียงดังนี้

4. เข้าศึกษาด้านคิดก้าก้านการใช้เทคโนโลยีสารสนเทศและการสื่อสารที่มีชื่อเสียงดังนี้

5. เข้าศึกษาด้านคิดก้าก้านการใช้เทคโนโลยีสารสนเทศและการสื่อสารที่มีชื่อเสียงดังนี้

ยิ่งใหญ่ที่มีประโยชน์อย่างยิ่งต่อการศึกษาด้านการสื่อสาร และกลุ่มคณาจารย์อิหร่านจาก

ประเทศไทยที่มีชื่อเสียงดังนี้ โดยทั่วไปจะได้ใช้ทรัพยากรและเครื่องมือเทคโนโลยีสารสนเทศและการสื่อสารที่มีชื่อเสียงดังนี้ให้การศึกษาด้านคณาจารย์การสื่อสารที่มีชื่อเสียงดังนี้ได้รับการศึกษาด้านคณาจารย์การสื่อสารที่มีชื่อเสียงดังนี้โดยทั่วไปจะได้ใช้ทรัพยากรและเครื่องมือเทคโนโลยีสารสนเทศและการสื่อสารที่มีชื่อเสียงดังนี้
APPENDIX H

Information letter to participants (English version)
Information Letter to Participants

Title of the thesis: An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand

Researcher and Contact details

This thesis is being undertaken as part of the requirements of a Doctor of Information Technology at Edith Cowan University.

The researcher: Mr. Nattavee Uaekrit
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia
Personal telephone: [Redacted]
E-mail address: nu11kril@student.ecu.edu.au

Sources of funding

Funding for this research is being provided by the researcher who will arrange everything so that no cost will be incurred by the participants.

Description of the thesis

As a Doctor of Information Technology student at Edith Cowan University, Western Australia, I would appreciate your support in this study. This research will concentrate on how senior Thai educators use ICT to attain their goals: professional goals and goals in their academic life. The purpose of this research is:

1. To explore your beliefs in using ICT for your professional goals.
2. To explore your attitudes in using ICT to achieve your professional goals.
3. To explore the level of your needs of ICT in your academic life.
4. To explore what ICTs are suitable to support your goals.
5. To investigate and recommend the best way of learning how to use appropriate ICT in your life.

The study aims to investigate how Thai senior educators utilise ICT to support their needs. In-depth information will be collected from this particular group to answer the research questions. The sample will include only Thai senior educators living in Bangkok and its surroundings.
A good response will help to gain a comprehensive picture of the study so I would appreciate your support in completing the enclosed questionnaire and participating in the in-depth interview. The questionnaires will take approximately 30 minutes to complete. Respondents who have provided meaningful comments, interesting data and a range of opinions will be selected for an in-depth interview after the questionnaire has been analysed. Please be assured that your data will be kept strictly confidential and used only for this study and there are no risks to participation beyond those encountered in everyday life.

The results of the research will be useful both for researchers and senior Thai educators to understand what ICT topics can enable them to reach their goals. It will also assist course developers to design and conduct appropriate ICT training that will assist senior academics. Once they are familiar with ICT, they will become confident in applying their new knowledge in their work. This will be of great value to them, will help them not to feel out-of-date, and permit them to have an easier life in modern society. Another significant outcome of this research is that it may also be of international importance to groups of senior people in both developing and developed countries where there are similar environments and factors.

If you would like to participate in this research project, please sign the Informed Consent Document attached to this letter, complete the questionnaire and return them in the enclosed stamp-addressed enveloped.

Data collection involving audiovisual recording

Tape-recordings will be used to gather further information during interviews and will be wiped clean after the study is completed.

Confidentiality of information

- The names and addresses of respondents will be coded on the questionnaire which will be retained for contacting respondents for in-depth interviews.
- Documentary records will be stored in a locked filing cabinet at the School of Computer and Information Science, Edith Cowan University and under similar conditions in my house in Thailand. I will be the only person with a key to each of these sites.
- The data on the computer in ECU and on my laptop will be protected by a password known only to me.
- The documents will be shredded and tapes of interviews wiped clean.

Results of the study

The data and information from your comments will be used to complete a Doctoral student thesis. The results of the study will not be made available to any third party or used in any published material without your prior consent.

Voluntary participation

Your participation in this study is completely voluntary. You may decline altogether, or leave blank any questions you do not wish to answer.
Withdrawing consent to participate

You may withdraw from involvement in the project at any time but a written letter of withdrawal should be forwarded to the researcher.

Questions and/or further information

If you have any questions about this study, please feel free to contact the researcher at contact address at the beginning of this letter.

Independent contact person

If you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:

Research Ethics Officer
Human Research Ethics Officer
Edith Cowan University
100 Joondalup Drive
JOONDALUP WA 6027
Phone: (08) 6304 2170
Email: research.ethics@ecu.edu.au
APPENDIX I

Informed consent document to participants
Informed Consent Document

Title of the thesis
An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand

Researcher and Contact details

This thesis is being undertaken as part of the requirements of a Doctor of Information Technology at Edith Cowan University.

The researcher: Mr. Natthat Chutkrut
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt Lawley Campus, Western Australia
Personal telephone: 61893152000
E-mail address: nuakrit@student.ecu.edu.au

Consent for audiovisual recording
Tape-recordings will be used to gather further information from the interviewees in the interview and will be wiped clean after the study is completed.

Consent for the use of data and/or samples collected
The data and information from your comments will be used to complete a Doctoral student thesis. The results of the study will not be made available to any third party or used in any published material without your prior consent.
Statement indicating consent to participate

To potential participants, I have read and understood the Information Letter.

• have been given the opportunity to ask questions and have had any questions answered to my satisfaction.

• am aware that if I have any additional questions, I can contact the research team.

• understand that the information provided will be kept confidential, and that the identity of participants will not be disclosed without consent.

• understand that the information provided will only be used for the purposes of this research project.

• understand I am free to withdraw from further participation at any time, without explanation or penalty.

• freely agree to participate in the project.

Participant or authorised representative                  Date

Investigator                                              Date
APPENDIX J

Informed consent document to participants (Thai version)
human research ethics committee

For all queries, please contact:
Research Ethics Officer
Edith Cowan University
160 Joondalup Drive
JOONDALUPWA 6027
Phone: 63042170
Fax: 63042961
Email: rses.ethics@ecu.edu.au

หนังสือให้ความยินยอมร่วมคณะกรรมการคัดกรอง
(โปรดส่งคัดกรองแบบสมัครภายใน 29 กรกฎาคม 2548)

หัวข้อเรื่องวิจัย ภักดีศึกษาด้านวิทยาศาสตร์ทางวิทยาการสารสนเทศและการสื่อสารของยุคยุคยุคใหม่

สำนักงานและสถานที่ที่ตั้ง

การวิจัยที่เกี่ยวกับการใช้เทคโนโลยีสารสนเทศและการสื่อสารของยุคยุคใหม่

มหาวิทยาลัยศิลป承德

สุทธิพงษ์ ฤทธิประทัย

ชื่อสกุล นามสกุล ฤทธิประทัย

ที่อยู่ School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia

โทรศัพท์ 610091727847 เบอร์ ECU 65812864
อีเมล

นิทกราฟิกที่ใช้

คุณสมบัติของนักวิจัย

นักวิจัยที่ได้รับความยินยอมให้คัดกรองสมัครได้จะต้องมีข้อทำนนวัตกรรมในการวิจัยที่เกี่ยวข้องกับกระบวนการวิจัย ซึ่งจะต้องเป็นผู้ที่มีความสามารถในการวิจัย และจึงไม่สามารถใช้ในการวิจัยได้
สำนักงานจดทะเบียนสหกรณ์ กรม วิศิษฐ์ฝ่ายบริหาร

ที่ ณ......…/……/……

เจ้าหน้าที่ (โปรดระบุชื่อ)………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………
An Investigation into the Use of Information and Communication Technology (ICT) by Senior Educators in Thailand

Nattavee Utakrit
M.S. Tech.Ed.

This thesis is presented in fulfilment of the requirements for the degree of Doctor of Information Technology

Faculty of Computing, Health and Science, Edith Cowan University, Mount Lawley Campus

Submitted 7th June, 2006
USE OF THESIS

This copy is the property of Edith Cowan University. However the literary rights of the author must also be respected. If any passage from this thesis is quoted or closely paraphrased in a paper or written work prepared by the user, the source of the passage must be acknowledged in the work. If the user desires to publish a paper or written work containing passages copied or closely paraphrased from this thesis, which passages would in total constitute an infringing copy for the purposes of the Copyright Act, he or she must first obtain the written permission of the author to do so.
ABSTRACT

Information and Communication Technology (ICT) may not just be for younger people or people who are still working. This study shows that it can be of importance for groups of senior people who are healthy and still have the desire to use their skills, abilities, and knowledge to assist or support our modern society. The particular groups of senior people concerned in this study were Thai senior educators above 60 from universities in Thailand living in Bangkok. The aims of this study concentrate on how they use ICT to attain their professional goals (research and teaching activities). It explores their beliefs, attitudes, the level of their needs of ICT for their professional goals and endeavours to find out what ICT is suitable. Another aim of the study is to investigate and recommend the best way of learning how to use appropriate ICT for their professional lives.

Quantitative and qualitative data were collected and provided answers to the research questions. It was carried out in two stages, first by administering a questionnaire survey of open-ended, multiple choice and Likert scale form questions and second, by in-depth interviews.

The results from this study show that Thai senior educators who are willing to keep on working believe their current skills and abilities can continue be used to support their work in their professional life and that they will benefit both themselves and society. The motivating factors that led them to continue working were convenience, professional dedication, concern for students, and personal beliefs.

The data reveals that their attitudes in using ICT to achieve their professional goals are positive and they feel ICT is a useful adjunct to support their academic activities in order to reach their professional goals. In the study, Thai senior educators wished to use ICT and to become familiar with it as it has many benefits providing them with information that can be used according to each person's need. Another factor in the study revealed that if they had their own ICT devices, such as a computer and access to the Internet to practise and use at home, it would increase their knowledge of other ICT software which they could apply to support their goals later.
There are various suitable ICT activities involving the use of a computer to carry out academic tasks, however, the most suitable are the use of the World Wide Web searching for information on websites, using a search engine to obtain information and to obtain direction on using ICT to search. Other activities that take advantage of using a computer are the word processing of tests, handouts and other materials and presenting lessons.

Many devices and software assist educators in their academic activities, however, not every type is suitable because it may be thought some are too hard to use and there may not be much chance to use them. The study found that a cell-phone was considered one of the most appropriate ICT devices, as were a desktop computer, a printer, and a scanner. Three software packages considered as the most suitable by these groups of people are a Word processor, Software presentations and Spreadsheets respectively.

Finally, it was obvious from the study that the most appropriate way of learning ICT would be by employing mixed methods by integrating learning in small groups with an educational environment, providing opportunities to confer with persons who can answer questions in the use of ICT and by utilizing opportunities to practise by themselves with media specially designed for these groups of people.
DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education.

(ii) contain any material previously published or written by another person except where due reference is made in the text; or

(iii) contain any defamatory material.

I also grant permission for the Library at Edith Cowan University to make duplicate copies of my thesis as required.

Signature: ...

Date: ....12th, October, 2006
ACKNOWLEDGEMENTS

There are many people who in different ways have contributed to the success of this thesis and I would like to thank all of them. However, my special thanks go to my Principal Supervisor, Dr. Jan Ring for her patient and continued guidance and encouragement throughout the period of my study. Even though I began this research in her last semester at ECU before her retirement, she kindly gave constant advice, assistance and support from the beginning to the end. This was invaluable in keeping me writing. Thank you very much and please accept my deep gratitude and appreciation.

Many thanks go to my Associate Supervisor, Dr. Chuiyaporn Chiratham Jared who also made valuable comments on my thesis. Thank you also to Dr Jeremy Pagrum and Dr. Barnard Clarkson who read and made valuable suggestions regarding my thesis proposal. Furthermore, thank you Professor Tony Watson and Associate Professor Dr. Jim Cross for offering me a place in study in the University who also advised me when I began. Thanks are also due to Associate Professor Dr Peng Lain, the DIT course coordinator, for her kind advice throughout my study.

I would like to extend my thanks to my ECU friends and other friends, both in Australia and in Thailand, who have always supported and encouraged me in different ways. Thank you to all my research participants who have given me very good feedback and provided valuable data to enable me complete my thesis.

Finally, my heartfelt appreciation goes to my parents and my younger sister to Associate Professor Dr. Sobson, Assistant Professor Dr Pranom, and Ms. Nattukant Utkrit, who have supported and encouraged me during my doctoral studies. Last but not least, thanks you to Sarinya Rawectrip, a very special person, who has stood by me and encouraged me on my long academic journey which has culminated in the completion of my thesis.
# TABLE OF CONTENTS

**USE OF THESIS**

**ABSTRACT**

**DECLARATION**

**ACKNOWLEDGEMENTS**

**CHAPTER 1 INTRODUCTION**

1.1 The background of the study ............................................................................. 1
1.2 The significance of the study ............................................................................ 2
1.3 The purpose of the study .................................................................................. 3
1.4 Research questions ........................................................................................... 4

**CHAPTER 2 LITERATURE REVIEW**

2.1 Introduction ........................................................................................................ 5
2.2 Defining ICT (Information and Communications Technology) ...................... 5
2.3 Older people's use of ICT ............................................................................... 7
2.4 The benefits of ICT for older people ............................................................... 9
2.5 ICT in Education ............................................................................................... 11
2.6 An overview of Thailand ............................................................................... 15
2.7 ICT in Thailand ............................................................................................... 15
2.8 ICT in education in Thailand ......................................................................... 18
2.9 Theories related to the study .......................................................................... 20
2.10 Similar study .................................................................................................. 24
2.11 Summary ......................................................................................................... 25

**CHAPTER 3 RESEARCH METHODOLOGY**

3.1 Introduction ....................................................................................................... 26
3.2 Research methodology ...................................................................................... 26
3.3 Quantitative research ...................................................................................... 27
3.4 Qualitative research ........................................................................................ 27
3.5 Mixed methods ................................................................................................ 28
3.6 Case study research ........................................................................................ 29
3.7 Data collection .................................................................................................. 30
3.8 Data analysis ...................................................................................................... 32
3.9 Sample ............................................................................................................. 32
3.10 Language, translation and transcription ......................................................... 33
3.11 Reliability and validity .................................................................................. 33
3.12 Ethical considerations .................................................................................... 34
3.13 Conceptual framework .................................................................................. 35
3.14 Conclusions ..................................................................................................... 38
CHAPTER 4 RESULTS
4.1 Introduction ........................................................................................................ 39
4.2 Descriptive results: participants' questionnaire data .............................................. 39
4.3 Answering the Research Questions ........................................................................ 42
  4.3.1 Research Question 1: .................................................................................. 43
  4.3.2 Research Question 2: .................................................................................. 59
  4.3.3 Research Question 3: .................................................................................. 72
  4.3.4 Research Question 4: .................................................................................. 86
  4.3.5 Research Question 5: .................................................................................. 96
  4.3.6 Research Question 6: .................................................................................. 106
  4.3.7 Research Question 7: .................................................................................. 109

CHAPTER 5 DISCUSSION AND CONCLUSIONS .................................................................. 127
5.1 Introduction ........................................................................................................... 127
5.2 Discussion ............................................................................................................. 127
  5.2.1 Research Question 1: .................................................................................. 127
  5.2.2 Research Question 2: .................................................................................. 130
  5.2.3 Research Question 3: .................................................................................. 133
  5.2.4 Research Question 4: .................................................................................. 136
  5.2.5 Research Question 5: .................................................................................. 137
  5.2.6 Research Question 6: .................................................................................. 141
  5.2.7 Research Question 7: .................................................................................. 143
5.3 Conclusions ............................................................................................................ 147
  5.3.1 Summary of the study .................................................................................. 147
  5.3.2 Implications of the study .............................................................................. 150
  5.3.3 Limitation of the study .................................................................................. 153
  5.3.4 Recommendations for further study .............................................................. 154

REFERENCES .................................................................................................................. 155
APPENDIX A: Glossary of terms ................................................................................... 161
APPENDIX B: A copy of questionnaire survey .............................................................. 163
APPENDIX C: A copy of semi-instructional form .......................................................... 180
APPENDIX D: The list of experts .................................................................................. 187
APPENDIX E: NVIVO Model of the In-depth interviews .............................................. 189
APPENDIX F: Interviewees' transcripts (English) ........................................................ 191
APPENDIX G: Information letter to participant (Thai) .................................................. 214
APPENDIX H: Information letter to participant (English) ............................................. 218
APPENDIX I: Informed consent document to participants (English) .............................. 222
APPENDIX J: Informed consent document to participants (Thai) .................................. 225
LIST OF TABLES

Table 2.1: ICT devices in education
Table 2.2: Software tools in education
Table 2.3: Internet adoption in South-East Asia (2003)
Table 2.4: Internet user profile of Thailand 2003 classified by careers
Table 2.5: The difference between pedagogy and andagogy as learners
Table 4.1: Gender of the participants
Table 4.2: Ages of participants
Table 4.3: Last or current educational position of participants
Table 4.4: Current skills and abilities of senior educators to support their professional life
Table 4.5: Keeping working to support their professional life
Table 4.6: How long do senior educators want to continue working
Table 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities
Table 4.8: Activities that senior educators intend to do in the future
Table 4.9: Correlation of two variables
Table 4.9a: Correlation matrix of the current activities of the participants and the activities they intend to do in the future
Table 4.9b: Brief of interview respondents’ backgrounds
Table 4.10: How much senior educators agree or disagree with “Computers and the Internet now plays great roles in education”
Table 4.11: How much senior educators agree or disagree with “ICT is only suitable for younger people”
Table 4.12: How much senior educators agree or disagree with “Everybody should know how to use a computer and the Internet”
Table 4.13: How much senior educators agree or disagree with “Educators should know how to use computers and the Internet”
Table 4.14: How much senior educators agree or disagree with “Using ICT helps me to gain more skills, experience, and better performance in my professional goals”
Table 4.15: How much senior educators agree or disagree with “ICT provides more advantages for my professional life than disadvantages”
Table 4.16: How much senior educators agree or disagree with “I am quite familiar with using ICT in my professional life”

Table 4.17: How much senior educators agree or disagree with “ICT is not hard to use if I have a good advisor to guide me”

Table 4.18: How much senior educators agree or disagree with “I should not fear using ICT”

Table 4.19: How much senior educators agree or disagree with “The computer and the Internet are important in supporting my academic goals”

Table 4.19a: Correlation of two variables

Table 4.20: How much do they [Thai senior educator] believe that ICT assists in the accomplishment of their professional goals

Table 4.20: How much do they [Thai senior educator] believe that ICT assists in the accomplishment of their professional goals

Table 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals

Table 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals

Table 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals

Table 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals

Table 4.25: How much do you believe using ICT can help you to achieve your professional goals

Table 4.26: How if they have an opportunity to use ICT would they like to try their facilities

Table 4.27: Do you believe that ICT benefits current educational societies

Table 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life

Table 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals

Table 4.30: The level of senior educators’ desire to use ICT to help achieve their professional goals
Table 4.30a: Correlation of two variables
Table 4.31: The level of senior educators' needs of a computer at home
Table 4.32: The level of senior educators' needs to access the Internet from home
Table 4.33: The level of senior educators' needs to keep their work and paper documents in their Hard disk or CD Rom
Table 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils
Table 4.35: The level of senior educators' needs to prepare lessons by PowerPoint
Table 4.36: The level of senior educators' needs of ICT to support them to achieve their academic goals
Table 4.37: A comparison of task activities of senior educators in supporting their professional goals
Table 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals
Table 4.38a: Correlation matrix of Thai senior educators' beliefs in how a particular type of ICT can assist in the accomplishment of their professional goals and how much they use ICT
Table 4.39: The percentages of scenario methods that were selected by the respondents
LIST OF FIGURES

Figure 2.1: Geographical location of Thai Internet users 16
Figure 2.2: Thai Internet users by age 19
Figure 2.3: Percentage of employment of Thai Internet users 20
Figure 3.1: Conceptual Framework 35
Figure 4.1: Percentages of the gender of participants 40
Figure 4.2: Percentages of the ages of participants 41
Figure 4.3: Percentage of the last or current educational position of participants 42
Figure 4.4: Current skills and abilities of senior educators to support their professional life 44
Figure 4.5: Keeping working to support their professional life 45
Figure 4.6: How long do senior educators want to continue working 46
Figure 4.7: Currently what activities are senior educators doing that involve their educational skills and abilities 47
Figure 4.8: Activities that senior educators intend to do in the future 48
Figure 4.9: A comparison between current activities of senior educators and the future activities they intend to do 49
Figure 4.10: How much senior educators agree or disagree with “Computers and the Internet now play great roles in education” 60
Figure 4.11: How much senior educators agree or disagree with “ICT is only suitable for younger people” 61
Figure 4.12: How much senior educators agree or disagree with “Everybody should know how to use a computer and the Internet” 62
Figure 4.13: How much senior educators agree or disagree with “Educators should know how to use computers and the Internet” 63
Figure 4.14: How much senior educators agree or disagree with “Using ICT helps me to gain more skills, experience, and better performance in my professional goals” 64
Figure 4.15: How much senior educators agree or disagree with “ICT provides more advantages for my professional life than disadvantages” 65
Figure 4.16: How much senior educators agree or disagree with “I am quite familiar with using ICT in my professional life” 66

Figure 4.17: How much senior educators agree or disagree with “ICT is not hard to use if I have a good advisor to guide me” 67

Figure 4.18: How much senior educators agree or disagree with “I should not fear using ICT” 68

Figure 4.19: How much senior educators agree or disagree with “The computer and the Internet are important in supporting my academic goals” 69

Figure 4.20: How much do they [Thai senior educator] believe that ICT assists in the accomplishment of their professional goals 73

Figure 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals 74

Figure 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals 76

Figure 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals 78

Figure 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals 81

Figure 4.25: How much do you believe using ICT can help you to achieve your professional goals 82

Figure 4.26: How if they have an opportunity to use ICT would they like to try their facilities 83

Figure 4.27: Do you believe that ICT benefits current educational societies 84

Figure 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life 86

Figure 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals 87

Figure 4.30: The level of senior educators’ desire to use ICT to help achieve their professional goals 88

Figure 4.31: The level of senior educators’ needs of a computer at home 90

Figure 4.32: The level of senior educators’ needs to access the Internet from home 91

Figure 4.33: The level of senior educators’ needs to keep their work and paper documents in their Hard disk or CD Rom 92
Figure 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

Figure 4.35: The level of senior educators' needs to prepare lessons by PowerPoint

Figure 4.36: The level of senior educators' needs ICT to support them to achieve their academic goals

Figure 4.37: A comparison of task activities of senior educators in supporting their professional goals

Figure 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals

Figure 4.39: The percentages of scenario methods that were selected by the respondents
CHAPTER 1
INTRODUCTION

1.1 The background of the study

Thailand is classified as a developing country (Nasingkun, 2003) and its government has successfully implemented ministerial regulations to support and encourage people to adopt ICT (Thuvosethakul, 2002). However, senior citizens in Thailand are still reluctant to use the new technology because they are unfamiliar with it. Unlike the new generation, they worked and lived in a period when this new technology was still in the development stage. They have grown old yet many of them are using their skills and ability to continue working as usual. For instance, they work as assistants in companies, as supplementary lecturers, and some are invited to be speakers at seminars or conferences in their specialized fields.

Thailand is classified as a developing country (Nasingkun, 2003) and its government has successfully implemented ministerial regulations to support and encourage people to adopt ICT (Thuvosethakul, 2002). However, senior citizens in Thailand are still reluctant to use the new technology because they are unfamiliar with it. Unlike the new generation, they worked and lived in a period when this new technology was still in the development stage. They have grown old yet many of them are using their skills and ability to continue working as usual. For instance, they work as assistants in companies, as supplementary lecturers, and some are invited to be speakers at seminars or conferences in their specialized fields.

The structure of Thai society is a hierarchical one where older individuals enjoy more status and seniority than younger ones and thus many senior citizens may find their skills more sought after than in a Western society. Naturally, people in this group are usually not familiar with the new technology, some however, are in day-to-day contact with ICT in their jobs. For example, there are educators in universities, people
who have knowledge, ability and experience that they would like to use to support society.

However, because of their age and the fact that they feel out-of-date, for they retired before the new technology came in, it may be hard for them to learn how to use ICT by themselves. Given that ICT can make an ordinary teacher's life easier and support his/her work (Alward, 2004), how can Thai senior educators catch up with the new technology? Do they really need to learn ICT at their age or not? How much ICT do they in fact require?

In addition, ways which work for younger people to use or become familiar with the new technology will not necessarily be successful with older people (Bean, 2001). Therefore, another important issue that needs consideration is what is the best way for them to learn and how can they utilise it in their work?

From the pragmatic reasons stated above, ICT is not just for the new generation or people who are still working, it may also be beneficial for other groups of people to help them participate in and contribute to modern society. This study focuses on end-users aged 60 and above in Bangkok, Thailand and their utilization of Information and Communication Technology. The phrase “Thai senior people” means people over 60, as 60 is the official age for retirement of Thai public servants (m-society.go.th, 2004). A study will be made of selected Thai senior university educators living in Bangkok as far as possible.

1.2 The significance of the study

Senior university educators in Thailand who are healthy are still important human resources for organisations and society (Rujikea, 2003). These people can contribute actively to society even though they have retired. According to the Thai Government's policy, these people are still needed to teach and conduct research in their respective fields (Khaosod, 2002) and at the same time, the Government also encourages Thai people to get used to ICT. This research has therefore been undertaken to support and be in line with these policies.
It will investigate a selective study of senior educators in Bangkok, the capital city of Thailand and its surroundings. It will specifically explore and analyse their use of ICT (Information and Communication Technology). For instance, what specific Technology they need, which are suitable for this group, how can they utilise them and how can they best learn new IT skills? The results of the research will help both researchers and senior Thai educators to understand what ICT topics can enable them to reach their goals. It will also assist course developers to design and conduct appropriate ICT training that will assist senior academics. Once they are familiar with ICT, they will become confident in applying their new knowledge in their work. This will be of significance to them and moreover help them not to feel out-of-date and permit them to have an easier life in modern society.

Another significant outcome of this research is that it may also be of international importance to groups of senior people in both developing and developed countries where there are similar environments and factors.

1.3 The purpose of the study

This research will concentrate on how senior Thai educators use ICT to attain their professional goals (research activities, teaching activities). The purpose of this research is:

1. To explore their beliefs in using ICT for their professional goals.
2. To explore their attitudes in using ICT to achieve their professional goals.
3. To explore the level of their needs of ICT in their academic life.
4. To explore what ICT is suitable to support their professional goals.
5. To investigate and recommend the best way of learning how to use appropriate ICT in their lives.
1.4 Research questions

This thesis aims to investigate the use of ICT by senior educators in Thailand. The major research questions will be divided into two areas; first, their professional goals (research activities, teaching activities) and second, the best way for them to learn ICT.

The first major questions concern their professional goals:

1. What are their professional goals?
2. What are their attitudes about using ICT to achieve them?
3. How much do they believe ICT can help?
4. What level of ICT do they need?
5. How can ICT help them to be successful?
6. What appropriate ICT do they need to succeed?

The second major question is:

What do they believe will be the best way for them to learn ICT?

Chapter 2 reviews the body of literature relating to the thesis. Chapter 3 describes the methodology used and includes the following sections: Research methodology, mixed methods (quantitative research and qualitative research), case study, data collection (Questionnaire surveys, In-depth Interviews), data analysis, sample group, language translation and transcription, reliability and validity, ethical considerations, scope and limitations of the study, and conceptual framework. Chapter 4 presents the analysis of the results; quantitative data, the questionnaire survey and the qualitative data, open-ended questions and in-depth interviews in order to answer research questions. Chapter 5 discusses the results and the final section, conclusions, consists of a summary of the study and its findings and ends with recommendations for further study.
CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This literature review aims at providing an insight into the concepts of this thesis through retrospective analysis of the relevant issues in the field and a similar study. The review includes:

- Defining ICT
- Older peoples’ use of ICT
- The benefits of ICT for older people
- ICT in education
- An overview in Thailand
- ICT in Thailand
- ICT in education in Thailand
- ICT and senior in Thailand
- Theories related to the study
- A similar study
- Summary

2.2 Defining ICT (Information and Communications Technology)

The acronym ICT stands for Information and Communication Technology and today it is being used especially in the fields of business, education, and in organizations. ICT has a synonym, IT (Information Technology) which preceded it. IT and ICT are defined as follows:

IT is a common term for the entire spectrum of technologies for information processing including software, hardware, communications technologies and related services. (Gartner, 2004, p. 210)
IT includes technologies used to create, store, and exchange information in formats that include computer data, telephony, instant messaging, graphics, and video. (Parsun & Oja, 2005, p. 40)

What is ICT?

ICT has a similar meaning to IT, however, it covers all elemental technology and the ways people use it to communicate at present. Authors have quoted its meaning has been defined as follows:

ICT is a generic term sometimes used (particularly in Europe) to refer to the combined fields of computing and communications. Commonly, Information Technology (IT) is used in this sense, since the latter term, by definition, includes both types of technology. (Ganther, 2004, p. 189)

A diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. (Tinio, 2003, p. 4)

ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email, robots. ICT is, therefore, concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is also concerned with the way these different uses can work with each other. (Tunr2unet, 2004)

As can be seen from these definitions of ICT and IT, they are similar in meaning and concept because both concern computers, software, the Internet and the processing of communication information using new technologies. However, the term Information and Communication Technology (ICT), which has recently replaced IT, is more appropriate in this research. According to the National Curriculum documents for the UK (2000), ICT is an adopted word from IT and it shows the importance of, rather than uses of “IT” (AuditmyC.com, 2004). In addition, the letter “C” in the middle of IT (Information Technology) emphasizes that it is not just only for computer technicians, but also relevant to anybody whose work or life involves communication and technology (flexibility.co.uk, 2000). The acronym ICT, therefore, in the context of this thesis will be used instead of IT.
2.3 Older peoples' use of ICT

Older people are interested in using ICT in everyday life because it can assist in their work, can be fun to use and because they are curious about this new innovation. The demand for the use of new technologies, computers and the Internet, has increased in many countries, however, as described below, the literature suggests that the number of aged people who have access to ICT is still limited compared to members of the younger generation.

"Computers are enhancing the lives of older people", according to a report concerning older people and the new technology by Irizarry & Downing (1997, p.161). The findings in this particular report noted that older people acknowledged the benefits of the new technology after they had completed a training course.

A survey by Age Concern and Barclays (AgeConcern.org.uk, 2002), shows that two-thirds of IT users above 55 agree that the Internet has had a positive impact on their lives.

In China, older people are eager to learn and catch up with new technological knowledge and about 70% of people in this age group like to log on to the Internet (China.org.cn, 2001).

According to an adult and teen survey in the U.S.A., the proportion of older people (over 55) in Michigan using the Internet is close to half the proportion of the teenage population teenagers, 44% and 88% of the respective age groups. Nevertheless 67% of adults are eager to learn and use new technologies, while 12% felt they are too complicated, only 14% disliked them and 7% did not know (Williams, 1999).

Growth in the use of the Internet by people over 55 in Australia is faster than in the past. The same fact was reported from the United States and Canada on this particular issue (Merkcs, 2000).

However, older people use ICT less than people in other age groups and much less than younger people. A report from the Department for Education and Employment (RSGB), Great Britain, (Russell & Drew, 2001) showed only 14% of Internet users
were 55 and above while the main group of users are those between the ages 16-34 (70%). Nevertheless, the report stated among current non-users, there are some who are interested in using computers or the Internet but have been prevented from doing so:

A paper by Houston (2002) however, shows older people in Ireland like to access information from printed media (80%) such as newspapers, newsletters, booklets and leaflets but 13% had used the Internet to access information. This suggests that computer access among older people in Ireland is now on the increase. The report, however, shows that several major barriers that obstruct older peoples' use of the ICT are as follows:

- The performance of sensory organs of the body that comes with age are poorer vision or lack of manual dexterity
- The cost of the equipment to use ICT is expensive
- Lack of confidence
- Lack of education or training
- Fear of embarrassment in a training or tutorial setting
- Inability to obtain transport to use computer facilities.

In addition, outdated equipment and inappropriate training methods are potential obstruction factors for older people to access ICT (Merkes, 2000).

In some countries, for instance, the United Kingdom and the United States, older people are encouraged to use ICT, however, so far only a few studies have examined in detail older adults' access to ICT (Selwyn, Gorard, & Madden, 2003). The report, "The older generation and the European information societies: access to the Information societies" mentions "more research needs to be carried out on the needs of older people and the benefits of ICT for this age group" (Campbell, 2002).

The above reviews show older people tend to be positive about the utilization of ICT, however, in developing countries, only a few older people enjoy the benefits compared to younger people and to date, few studies have been conducted on older people as regards this particular issue. This research will study this particular age group and endeavor to answer the research questions.
2.4 The benefits of ICT for older people

ICT influences many people in today's society. People are confronted with the use of ICT from morning until bedtime. Mobile phones, the radio and television, are common types of ICT that people use regularly in daily life. However, the e-service or e-government provided by governments is an important new example of using ICT support for everyday life. Governments distribute useful information for people via the Internet on topics such as, payment of tax, emigration, sickness benefits administration, electronic services to families, geographical data sharing, hospital-nursing home cooperation, immigration cases, occupational accident administration, car registration, agricultural regulation, and welfare benefits administration (c.gov.dk, 2004).

According to Kirkwood (2001) in a study of "older people and the Internet":

IT can transform the lives of older people, providing contacts, information, entertainment and access to specialised services. It can enable radical new models of health care and support for older people living at home, effecting savings that would amply repay the costs of installing an internet connection in every house, just like electricity, gas and water. But it requires profound changes in attitude - a belief in, and a belief by, older people that they can cope. (p. 1)

Moreover, using ICT can help senior people not feel so isolated as suggested by Lewin (2001):

Although not a cure-all, learning to use a computer may help to compensate for some of the problems and conditions which commonly accompany older age (p. 5)

This means ICT is of significance to them as it is not just for people in particular fields, but can provide both older people and younger people with similar benefits. Campbell (2002) indicate conclusively the benefits of ICT to older people as follows:

- Communication: e-mail and chatting programs allow people to communicate and provide a means of exchanging or transferring data during a discussion. This is a particular advantage for older people who are not able or are less able to communicate in real life.
- Information resource: using the Internet everyone can gain more information in a short time, information on health, pensions, social security, employment, retirement, housing, insurance and travel.
- Employment: using ICT increases the opportunity for obtaining many jobs. Older people who are familiar with ICT will improve their employment options. ICT makes it possible for new and flexible modes of work, for instance, teleworking.

- Electronic commerce: teleshopping and telebanking are services which are useful for older people especially for those who have transportation limitations.

- Independent living: ICT can help support older people to live healthily and independently at home by using telemedicine, treatment, and electronic commerce.

- Intergenerational relationships: access to ICT can improve older people's contact with their grandchildren and younger people generally.

- Distance learning: this can be valuable for older people who might otherwise be excluded from the traditional educational system. Learning with or about ICT helps to maintain mental skills and health.

- Cost reduction: older people can use ICT to reduce the cost of delivery services.

- Strengthening the community: ICT can be successful in developing local communities, from which older people will benefit.

The above factors emphasize the benefits of ICT for older people in general and show how important it can be. This study will focus in-depth on Thai senior educators' use and the associated benefits of using ICT, a subject on which no research has so far been done. In attempting to answer the research questions it will be necessary to consider the above mentioned areas.
2.5 ICT in Education

“Where the appropriate systems of support are in place, then the ICT can be experienced as a transformative technology both for staff and for students”

(Comber & Lawson, 1999, p. 51).

In the past, teachers stood in front of class with a chalkboard during the allotted class time and occasionally asked the class questions. Overhead transparencies were later used to help as teaching aids (Liebman, 2004). However, new technology helps teachers and enables them to teach in different ways and it also enables students to transfer their knowledge to others (Davivongse, 2004).

The use of ICT challenges the education system (Jensen, 2003) as it includes all the components of new information technology in the delivery of educational materials (Roberson, 2000). ICT involves using multimedia technologies, for instance, audiovisual aids that are good tools to enhance the teaching and learning process (ITEA, 2004). They have become commonplace in peoples' working and learning lives (Duggleby, Jennings, Pickering, & Schmoller, 2004).

Brown (2005) has also described the benefits of ICT for educators in their workforce as below;

• ICT offers educators new ways of teaching the same things
• ICT enables a focus on each and every learner style
• ICT is a tool in the armoury for tackling barriers to engagement
• ICT helps educators reduce bureaucratic burdens
• ICT saves time in lesson planning and administration
• ICT offers a more comprehensive approach to assessment

While ICT is challenging and becoming part of educational societies, today many types of ICT assist are being used and may be classified into two types: ICT devices and Software tools.
## ICT devices in education

<table>
<thead>
<tr>
<th>Type</th>
<th>Benefits</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>Support teaching in various ways such as:</td>
<td>Desktop, Laptop</td>
</tr>
<tr>
<td></td>
<td>• prepare or present lessons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• communicate with students, administrators, colleagues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• search for information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• generate or keep record data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• entertain users: researchers, lecturers, or students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• facilitate project based learning</td>
<td></td>
</tr>
<tr>
<td>Hand-Held ICT devices</td>
<td>Support indoor and outdoor activities for educational needs, such as: **</td>
<td>PDA (Personal Digital Assistant), Digital camera, and Mobile phone</td>
</tr>
<tr>
<td></td>
<td>• provide functions and the capacity close to desktops and laptops</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Portable devices for education activities everywhere</td>
<td></td>
</tr>
<tr>
<td>Other ICT devices</td>
<td>Support educational activities in various tasks depending on the type or the way they are used: such as: **</td>
<td>Video, DVD player, projector, CD, DVD-ROM drive, small data storage unit (USB drive, or thumb drive), Web camera</td>
</tr>
<tr>
<td></td>
<td>• preparing, creating teaching aids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• recording or transferring movies, photos, or sound</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• storing data</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: ICT devices in education

Source: * = (Geisert & Futrell, 2000), ** = (Shelly, Cashman, & Vernaat, 2006)
<table>
<thead>
<tr>
<th>Type</th>
<th>Benefits</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Word Processor</strong></td>
<td>Support educators to:</td>
<td>Microsoft Word,</td>
</tr>
<tr>
<td></td>
<td>* prepare instructional materials,</td>
<td>WordStar,</td>
</tr>
<tr>
<td></td>
<td>individualized worksheets, reports</td>
<td>WordPerfect,</td>
</tr>
<tr>
<td></td>
<td>* keep records (e.g. classroom records, school projects, or inventories)</td>
<td>MacWrite, Magic</td>
</tr>
<tr>
<td></td>
<td>* save student information in electronic files</td>
<td>Slate</td>
</tr>
<tr>
<td></td>
<td>* print out announcements, letters, reports, or worksheets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* check errors of spelling or grammar in the work sheets or reports by using a spell checker</td>
<td></td>
</tr>
<tr>
<td><strong>Spreadsheet software</strong></td>
<td>Support educators to:</td>
<td>Microsoft Excel</td>
</tr>
<tr>
<td></td>
<td>* organize data in tables and perform calculations on the data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* creating charts and graphs</td>
<td></td>
</tr>
<tr>
<td><strong>Software presentation and Multimedia software</strong></td>
<td>Support educators to:</td>
<td>Microsoft PowerPoint,</td>
</tr>
<tr>
<td></td>
<td>* improve presentations by using graphics, animation, or sound</td>
<td>Macromedia Director, and</td>
</tr>
<tr>
<td></td>
<td>* create teaching aids such as CAI</td>
<td>Macromedia Authorware</td>
</tr>
<tr>
<td><strong>Graphics tools</strong></td>
<td>Support educators to:</td>
<td>Adobe Photoshop,</td>
</tr>
<tr>
<td></td>
<td>* create graphics for a variety of uses</td>
<td>Adobe Illustrator,</td>
</tr>
<tr>
<td></td>
<td>* alter graphics from other sources such as scanned images, pictures from the World Wide Web, clip art, photos from digital cameras, or previously created graphics</td>
<td>CorelDraw, MacPaint</td>
</tr>
<tr>
<td>Type</td>
<td>Benefits</td>
<td>Examples</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The Internet</td>
<td>Offers teachers and learners many opportunities to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• increase knowledge from the resources on the Internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• access a wide range of resources available at any time and place, allowing teachers and learners to maximize their teaching and learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• meet and have synchronous communication via chatting or asynchronous contact through e-mail or a forum</td>
<td></td>
</tr>
<tr>
<td>World Wide Web</td>
<td>Allows educators to access and view information on Web pages by using an application software called a Web browser. The information contains text, graphics, audio, video, and connection to other documents.</td>
<td></td>
</tr>
<tr>
<td>CAI (Computer Aided Instruction)</td>
<td>Makes the learning process more efficient because it:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• saves time and the cost of course instructors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• It is individualized and convenient for students to set up their own schedules and flexible because it can be moved to other places.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Software for CAI can track course progression, test scores, and be updated.</td>
<td></td>
</tr>
<tr>
<td>Search engines</td>
<td>Allow educators to find specific documents and information on the Internet through key word search and menu choices.</td>
<td>Yahoo, Google, Lycos, AltaVista</td>
</tr>
<tr>
<td>Email</td>
<td>Allows educators to transform messages, photos, electronic documents, audio and video clips and electronic files via a computer network.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2: Software tools in education

Source: * = (Geisert & Futrell, 2000), ** = (Forcier & Desey, 2005), *** = (Brusilovsky, 2001), **** = (Shelly et al., 2006)
2.6 An overview of Thailand

Thailand, classified as a developing country (Nasingkun, 2003) is located in Southeast Asia covering an area of 513,115 square kilometers, equivalent to the size of France (start.gov, 2004). It is divided into four natural regions: North, Northeastern, Central and Southern. It has 76 provinces and its capital, Bangkok, is located in the central part (Thuvasethakul & Kasititorn, 2003).

The U.S Department of State (start.gov, 2004) reports that in 2003, Thailand’s population reached 64.2 million about 9.6 million of which are in Bangkok. The age structure between 0-14 years is 24.2%, 15-64 years is 68.8%, and 65 years and over is 7% respectively (thedora.com, 2004).

2.7 ICT in Thailand

<table>
<thead>
<tr>
<th>Country</th>
<th>Internet adoption in South-East Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High adoption rate</td>
</tr>
<tr>
<td>Singapore</td>
<td>51.48%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>25.15%</td>
</tr>
<tr>
<td></td>
<td>Medium adoption rate</td>
</tr>
<tr>
<td>Thailand</td>
<td>9.5 and 11%</td>
</tr>
<tr>
<td>Brunei</td>
<td>9.97%</td>
</tr>
<tr>
<td>Philippines</td>
<td>7.77%</td>
</tr>
<tr>
<td></td>
<td>Low and very low adoption rate</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.93%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.49%</td>
</tr>
<tr>
<td>Laos</td>
<td>0.17%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.08%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

Table 2.3: Internet adoption in South-East Asia by Nua Internet Surveys (2003)  
Source: (Poonsri, 2003)
After the World Bank had explored and evaluated knowledge and information systems in Thailand, it found Thailand's use of ICT (Information and Communication Technology) is still low (Koonnantakool, 2003). Table 2.3 shows the percentage of Internet adoption in Thailand compared with other South-East Asian countries in 2003 (Poonsri, 2003) from which it can be seen that the Internet adoption rate of Thailand is between 9.5 to 11%. Thailand is given a medium rating in comparison with other countries in South-East Asia (Poonsri, 2003). It is higher than countries such as Indonesia, Vietnam, Laos, Cambodia, Myanmar but still low compared to Singapore and Malaysia.

However, according to the Asia Marketing Research publication "Internet Usage, Population Statistics and Information" (InternetWorldStats.com, 2003), the growth of ICT users in Thailand has increased from around 2.3 million to over 3.5 million users, over 50 percent within the last two years. The use of ICT in Thailand centres around Bangkok, and its surroundings, where the ICT facilities are better than in other areas. The pie chart below shows the percentage of Internet users in different parts of Thailand. It can be seen that 54.3% of Thai Internet users are living in Bangkok, 25.8% are in the vicinity, and 18.1% and 1.8% respectively are living in rural areas and abroad.

![Geographical location of Thai Internet users](NECTEC & NSTDA, 2004)

Figure 2.1: Geographical location of Thai Internet users
Source: (NECTEC & NSTDA, 2004)
Table 2 below classifies the percentages of Thai Internet users by career. The biggest percentages come from IT, education and research, (15.4%, 14.2%) respectively, however, this does not include other careers (15.2%).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>15.4</td>
</tr>
<tr>
<td>Education, Research</td>
<td>14.2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>6.9</td>
</tr>
<tr>
<td>Healthcare</td>
<td>6.3</td>
</tr>
<tr>
<td>Banking, Finance</td>
<td>5.1</td>
</tr>
<tr>
<td>Mass Communication, Advertising</td>
<td>4.6</td>
</tr>
<tr>
<td>Electricity, Telephone, Waterworks</td>
<td>3.9</td>
</tr>
<tr>
<td>Retail</td>
<td>3.7</td>
</tr>
<tr>
<td>Import, Export</td>
<td>3</td>
</tr>
<tr>
<td>Tourism, Hotel, Restaurant</td>
<td>3</td>
</tr>
<tr>
<td>Construction, Real Estate</td>
<td>2.9</td>
</tr>
<tr>
<td>Law</td>
<td>2.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2.7</td>
</tr>
<tr>
<td>Transportation, Warehousing</td>
<td>2.5</td>
</tr>
<tr>
<td>Wholesale</td>
<td>2.1</td>
</tr>
<tr>
<td>Entertainment, Art</td>
<td>1.8</td>
</tr>
<tr>
<td>Military</td>
<td>1.6</td>
</tr>
<tr>
<td>Government Policy Making</td>
<td>1.2</td>
</tr>
<tr>
<td>Business Consulting</td>
<td>1.1</td>
</tr>
<tr>
<td>Other careers</td>
<td>15.2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2.4: Internet user profile of Thailand 2003 classified by career

Source: (NECTEC & NSTDA, 2004)

The Thai Government and business organisations have cooperated and invested in enhancing ICT in Thailand recognising it as a potential issue for Thai social and economic development. Many policies and plans from the Government have been put forward from time to time, for instance, the IT 2000, IT 2010 policies which are to encourage, develop and lead Thailand to a Knowledge-based Economy (Koonantakool, 2003). According to the Thai Minister of Information and Communication Technology, Mr.Sumpong Suebwonglee, quoted from Thailand board of Investment (2003) the present Prime Minister of Thailand is committed to developing Thailand into a “knowledge-based society".
Moreover, the 5E strategy, e-Government, e-Commerce, e-Industry, e-Education, and e-Society, have been included in Thailand's national information technology master plans (IT2010) in order to reach the Thai people and support their adoption and use of ICT (ICT_Expo2005, 2004). To date, the Government has launched several projects to help Thai people become aware of the use of ICT for example the “ICT Computers for Thais project” providing low-cost computers to low and middle-income families, students, and civil servants (Thairath.co.th, 2004), and “The SchoolNet”, a national school informatization program to empower all schools to access a large pool of information using the Internet (School.net.th, 2004).

Three other examples the “Thai ruralNet”, “Community Telecenter” and “the Government Information Network” (GINet) are all government backed networks to facilitate intra-and inter-agency communication and information exchanges (Thuvasethakul & Koanantakool, 2002).

This background information on Thailand is important because it reveals the position of ICT in the country, indicates the trend that ICT users of the Internet are increasing annually, and that the Thai Government is enhancing ICT use by encouraging the Thai people to utilise its facilities by launching projects and policies to support it. However, as the majority of ICT facilities are located in the Bangkok area, the largest number of people using the Internet lives there.

2.8 ICT in education in Thailand

According to Tinio (2003):

For developing countries, ICT has the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalizing strategy for developing countries (p. 6).

Thailand is a member of the ASEAN group of countries and is classified as a developing country (Nasingkun, 2003). The Thai Government, wishing to encourage Thai people to use ICT, has launched the National ICT Plan specifically for education and provided both teachers and student with ICT resources, such as computers, support teachers and student learning. In addition, the Government is also encouraging Thai
teachers to become more familiar with ICT. To date, about 21% of all teachers have been trained in a variety of ICT programs to support their work depending on their needs. The ICT programs that are most requested and for which most teachers have been trained are Microsoft Office, Visual Basic, HTML, SQL, and CAI (Belawati, 2003). The Government is also planning to have at least 300,000 teachers who can use ICT by 2006, 70% of whom are located outside Bangkok and it is envisaged that at least 90% of new graduates from formal educational programs will be able to use ICT (Thuvashakul & Kosititorn, 2003). In addition the Government has also initiated ICT projects for educational activities. For example, the project “SchoolNet Thailand” a national school “informatization action program” which linked about 5,000 schools online through their websites (Tubtimhim, 2001).

2.9 ICT and senior people in Thailand

The use of ICT among seniors in Thailand is still low. According to the bar graph (Figure 2.2), Internet usage by these over 60s is only a tiny fraction of the total, just 0.2%.

![Bar graph showing Internet users by age in Thailand (2004)](image)

Figure 2.2: Thai Internet users by age (2004)

Source: (NECTEC & NSTDA, 2004)

A study conducted by Sungsri (1999) about the basic information needs of Thai senior citizens between 55-70 showed that although many still wished to obtain education, knowledge and information, the methods of disseminating and obtaining
knowledge and information they used most were not computers or the Internet, but television broadcasting, radio, newspapers, knowledgeable persons and textbooks. ICT is still not popular for this group of people.

Moreover, Figure 2.3 shows that the retired only account for a very low proportion of total internet use, in fact they are the smallest group of internet users, at just 0.3% of the total number of users, and Thai senior educators also belong to this group. Regarding new technologies, however, Thai senior educators have more contact with them than other group of seniors. According to the Thai Government's policy, these people are still needed. The policy extend the retire age of Thai senior educators has been raised from 60 to 65 and also encourages those who still have ability and good health to teach and continue to provide support in their education fields (Khaosod, 2002). Therefore, one aim of this study is to investigate how this group can become familiar with ICT and realize the gains from its use.

2.10 Theories related to the study

Andragogy is defined by Knowles (1970) as "the art and science of helping adults to learn", and has evolved to describe all adult learning. As this study concerns senior persons regarding their use and learning how to use ICT to support their professional goals, andragogy is important. In addition, the Characteristics of Adults as Learners (CAL) model and the difference between pedagogy and andragogy, as well as
other issues concerning adults and learning will be used to guide and frame the research and are detailed in the following section.

Principles of adult learning

Malcolm Knowles was important in establishing theories on how adults learn and in describing adult learning (Dunn, 2000). His concepts have been used widely and become accepted as principles of adult learning today (O'Brien, 2004).

Lieb (1991), Dunn (2000), LaLonde (2004), and O'Brien (2004) define the principles of adult learning from Knowles' theories as follows:

- Adult learners are "self-directed". They need to be free to decide by themselves what they want to know or to learn. This includes implementing, planning and evaluating their learning activities. However, trainers can help them by acting as facilitators and guide participants rather than just supplying them with content.

- Adults prefer to learn, when they perceive the importance of new learning. They must see a reason for learning something and it has to be applicable to their work or other responsibilities and to be of value. Therefore, trainers must clearly identify the objective of learning and why learning things will be useful and help achieve goals.

- Adults have considerable knowledge, skills and experience from their past, far more than younger people. This is the difference between adults and younger people so trainers should consider this experience and use it as a resource to help them obtain new knowledge.

- All adult learners need to be shown respect. Trainers need to take into consideration the knowledge and experience that they bring into classes, they should allow them to voice their views freely, and encourage equal participation for all in the class.
These principles of adult learning need to be taken into consideration in this study. As such, a researcher must consider these concepts to obtain an understanding of the information received from the participants. The work of other theorists such as Merriam & Caffarella (1991, pp. 123-125), Mezirow (1999, pp.3-33) and Brookfield (1988, pp.3-50), is also of interest.

The Characteristics of the Adults as Learners (CAL) model.

The Characteristics of Adults as Learners (CAL) model was developed by Cross (1981) and integrates many elements from other theories. It involves two characteristics or variables, personal (aging, life phases, and developmental stages) and situational (part-time versus full-time learning, and voluntary versus compulsory learning). The model, based on these principles, will be used in the study and in the design of research tools. This model concerning adult learning will be used as a guideline for this research into Thai senior educators and their learning to use ICT. It helps the researcher to reach an improved understanding of the characteristics of senior educators and to design the research tools more meaningfully, especially the interviews. The particular principles that have influence this study are as follows:

- Adult learning programs should capitalize on the experience of participants.
- Adult learning programs should adapt to the ageing limitations of the participants.
- Adults should be challenged to move on to increasingly advanced stages of personal development.
- Adults should have as much choice as possible in the availability and organization of learning programs.
Differences between pedagogy and andragogy as learners:

Table 2.5 below shows the differences between pedagogy and andragogy in learning as defined by Mihall & Belletti (1999).

<table>
<thead>
<tr>
<th>Pedagogy</th>
<th>Andragogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rely on others to decide what is important to be learned</td>
<td>Decide for themselves what is important to be learned</td>
</tr>
<tr>
<td>Accept the information being presented at face value</td>
<td>Need to validate the information based on their beliefs and experience</td>
</tr>
<tr>
<td>Expect what they are learning to be useful in their long-term future</td>
<td>Expect what they are learning to be immediately useful</td>
</tr>
<tr>
<td>Have little or no experience upon which to draw - are relatively &quot;clean slates,&quot;</td>
<td>Have much experience upon which to draw - may have fixed viewpoints</td>
</tr>
<tr>
<td>Little ability to serve as a knowledgeable resource to teacher or fellow classmates</td>
<td>Significant ability to serve as knowledgeable resource to trainer and fellow learners</td>
</tr>
</tbody>
</table>

Table 2.5: The differences between pedagogy and andragogy as learners

It can be seen from the above table that adults have certain special characteristics in their learning style which differ from those of younger students. Adults have a need to learn depending on their desires and will make decisions themselves based on their beliefs and experiences. These concepts are similar to the principles of adult learning and the CAL model and also are significant points for this study.

To sum up, this section has introduced a range of principles of adult learning that will have an impact on the study, the characteristics of adult learner models and the different learning patterns that apply to andragogy and pedagogy. They will be used to help the researcher design and account for research tools, understand the findings from the participants, and draw the conclusions of the thesis.
2.11 Similar study

There have been other studies relating to the use of ICT by older people but they have not been concerned with senior educators in Thailand and none provide significant evidence of beliefs, attitudes and needs in ICT.

A study similar to this research, “Lifelong learning, ICT, and elderly people” was carried out by Danni & Maria (2001). The authors focused on to what extent people aged 60 and above in the UK and Greece use public libraries, and particularly ICT, for lifelong learning purposes. It also identified the kind of services provided by these libraries to support the learning needs of elderly people. Emphasis was placed on ICT infrastructure and an analysis compared the findings showing what Greece could learn from the UK and it finally suggested ways for improvement in both countries.

The researchers found that older people used mainly printed documents such as books and newspapers and sometimes microfilms and CD-ROMs for information retrieval. ICT was mainly used for information retrieval and word processing. They often feel scared about the technology but are willing to try to use it provided someone instructs them. Finally their study shows that older people are concerned about where they can learn and what staff support will be provided to encourage learning ICT.

Although this study has some similarities to the present study in terms of investigating the use of ICT by older people, it was conducted in Europe where ICT facilities are often quite sophisticated. It did not cover developing countries and was not specific about older people in particular careers. This research, does focus on a particular career group, senior educators in Thailand. The results of their study, however, are relevant to this thesis and will be used as a reference point in designing tools.
2.12 Summary

This chapter presents information on the ICT world, ICT in Thailand, and ICT in Education. It also mentions the relationship between older people and ICT, including senior educators in Thailand and reveals its importance in education. However, as the relationship between senior people and ICT is still low, so as to be able more research needs to be carried out on their attitudes, beliefs and needs to acquaint older persons of the advantages of using this powerful information tool.
CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the study's research methodology and includes the following sections: Research methodology, mixed methods (quantitative research and qualitative research), case study, data collection (Questionnaire surveys, In-depth Interviews), data analysis, sample, language translation and transcription, reliability and validity, ethical considerations, and conceptual framework.

3.2 Research methodology

There is a wide variety of methods that can be used to gather data for a research project. The most common distinction used in educational research is between quantitative and qualitative methods. Quantitative methods are usually based on collecting information in the form of numbers that produce a more generalisable picture of a problem (Bell, 1993) and qualitative methods is most effective for gathering information that contributes to the depth and detail of qualitative inquiry (Patton, 1990). However, as this research concerns the beliefs, attitudes, levels of needs and goals of a particular group of academic retirees in Thailand, to obtain answers to the research questions, quantitative methods were undertaken in the questionnaire surveys to explore their beliefs, attitudes, level of needs, and the best way for them to learn ICT. Qualitative methods, however, were required to obtain information in the In-depth interviews, therefore, the author believes that a mixed method, a combination of quantitative and qualitative research methods, is the most appropriate and it is used for this study.
3.3 Quantitative research

Quantitative research is a method which aims to explain and predict or to confirm and validate; it emphasizes the testing of theory supporting the research purposes. It concerns numbers, statistical data including numerical data and the methods of data collection, usually large samples (Leedy, 2001). It is also an investigation into the distinguishing characteristics, elemental properties, and empirical boundaries and tends to measure "how much or "how often"(Nou, 1995). The method is commonly based on collecting data, including questionnaire surveys (Bell, 1993).

3.4 Qualitative research

According to Hayllar& Veal (2000):

Qualitative research methods are concerned with collecting information which does not involve numbers. They typically focus on a small number of people and produce large amounts of information about these people (p. 30).

In addition, qualitative research seeks to gain insight into human characteristics such as motivation, attitudes and behaviour in order to increase the understanding of a problem (Bell, 1993). The methods were developed to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research, ethnography and grounded theory.

Myers (1997) suggested the choice of collecting data in qualitative research, for instance, can include observation, participant observation (fieldwork), interviews and questionnaires.
3.5 Mixed methods

Johnson & Onwuegbuzie (2004) defined the mixed methods as follows:

Mixed method research is formally defined here as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study (p.14).

In social and behavioral sciences, mixed methods are the most appropriate and more efficient in answering research questions other than employing quantitative or qualitative approaches alone (Tashakkori & Teddlie, 1988).

Qualitative and quantitative methods can be integrated and used together as mixed methods. Stecker, McLeroy, Goodman, Bird, & McCormick (1992) have described the four main ways of integrating methods in their work as follows:

- Qualitative methods are used to develop quantitative measures; for example, focus groups used to develop questionnaire items.
- Qualitative methods are used to help explain quantitative findings; for example, in-depth interviews to find out why compliance in drug trial was low.
- Quantitative methods are used to help explain qualitative findings; for example, the observation that women are reluctant to participate in exercise is qualified by a survey which reveals that it is older women who participate least.
- Qualitative and quantitative methods are used together for cross-validation and triangulation; for example, before and after trials for smoking cessation is compared with recording of advice given, and in-depth interview with clients pre and post the intervention.

Using mixed research methods, combining qualitative and quantitative data is a methodology endorsed and used by many eminent researchers (Oburai, Wai, & Baker, 2005).

Previous researchers, for example, Chansilp (2003) chose mixed research methods incorporating quantitative approaches and qualitative for his study. A quantitative design, quasi-experimental, was chosen to determine if there would be
improved performance among students and qualitative design involving observation and interviews was used to explore the impact of the tool and to establish casual relationships between its use and the performance of the students.

The research of Oburni, Wai, & Baker (2005) also used mixed research methods to investigate patterns in marketing channels and international marketing strategies. The data collection in their study is exploratory and qualitative involving in-depth interviews of their samples and public sources.

Vncharaskunee (2000) conducted research concerning Thai teachers' beliefs on the topic "Target language avoidance by Thai teachers of English: Thai teachers' beliefs". Her study was based on survey methods and focus group interviews. A qualitative method was used with the interviews and a quantitative method was undertaken with the data from questionnaires.

For this research, the author has chosen mixed methods, combining quantitative and qualitative research, to accomplish the goals of the study, the details of which are outlined in the paragraphs on data collection.

3.6 Case study research

The research focus for this study concerns beliefs, attitudes, and goals of a particular group, academic retirees in Thailand. Therefore, the choice of the research method undertaken must be in line with the aims, the questions posed and the limitations of the research. The research method approached is "Case study research", details of which are outlined in the paragraphs below.

The term "Case study" has a variety of meanings. It can be used to describe a unit of analysis, for example, a case of a particular organisation or to describe a research method (Myers, 1997). According to Struman (1997) a case study is a generic term for the investigation of an individual, group or phenomena.
Orlikowski & Baroudi (1991) mention case study research as one type of qualitative method and the most commonly used in information systems. A distinguishing feature of the approach is that in order to explain, predict or generalise from a single case, it is necessary to conduct an "in-depth investigation of the interdependencies of parts and of the patterns that emerge" (Struman, 1997).

In addition, Yin (2002) defines the scope of a case study that it is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

This case study investigates Thai senior educators from Thai universities and how they utilise ICT to support their needs. In-depth information will be collected from this particular group to acquire answers to the research questions. The case study approach was chosen of this study focuses on a particular group of people. The answers to the research questions use mainly come from qualitative data so a case study methodology is suitable to investigate and analyse the information from a particular group.

3.7 Data collection

The study is concerned with investigating information from a specific group to answer the research questions and the data collection methods used include quantitative and qualitative techniques. The quantitative technique employed is a questionnaire survey (multiple choice and Likert scale forms) and the qualitative technique included open-ended questionnaires and in-depth interviews.

3.7.1 The Questionnaire Survey

Mitchell & Jolley(1988, p.288) state "A survey can be a relatively inexpensive way to get information about peoples' attitudes, beliefs, and behaviours". A questionnaire survey is one commonly used approach to obtain information or data from
n large number of people and is particularly useful when a respondent wishes to enjoy confidentiality (Hayllar & Veal, 2000).

The questionnaire survey is an important tool in this research for obtaining qualitative and quantitative data based on the research questions. It was used in the initial stage of collection, pilot testing and in the real testing stage. It consisted of open-ended, multiple choice questions and Likert scale forms and was sent by mail or delivered in person to participants.

### 3.7.2 In-depth Interviews

Another important tool for data collection in this study is the in-depth interview. Interviews were conducted with a small sub-group after the questionnaire survey had been completed. The results and information obtained from the initial stage were analysed and used to design the tools for the interviews and to aid in the selection of interviewees.

In general, interviews can contribute a great deal of extra useful information to a researcher. They can ask any related questions and observe any reactions from respondents, for example, the facts, people's beliefs about the facts, feelings, motives, present and past behaviours, standards of behaviour, and conscious reasons for actions or feelings (Silvennan, 1993). An in-depth interview usually involves a small sample (10 or less) at a site. (Hayllar & Veal, 2000).

Concerning collecting data by in-depth interviewing Berry (1999) states that:

> There are many types of interviews that have been used for data collection, however, in-depth interviewing also, as known as unstructured interview or semi-structured interview, is now the one that is widely used in educational research and is generally regarded as a powerful tool in extracting data, in particular qualitative in nature (p. 1).

In this study, respondents who provided meaningful comments, interesting data and a range of opinions were selected for interview. The in-depth interview attempted to obtain greater depth of information on the research topic and act as a supplement to the data received from the questionnaire. The in-depth interview also tries to find out why respondents answered as they did on the questionnaire by asking probing questions.
3.8 Data analysis

Traditionally, qualitative data were analysed by hand, using a filing system (southalabama.edu, 2004). To date, computer software is now commonplace in analysing qualitative data (Jemmott, 2004). In this study, multiple choice data and the Likert scale data were analysed according to the frequency count and mean percentage calculations by using the computer software SPSS for Windows.

Another computer software package “NUDIST Vivo”, usually called “Nvivo”, was used for the open-ended questions and the in-depth interview stage. Nvivo ordinarily provides a guide through many options and possibilities in qualitative data analysis, assists researchers handling non-numeric and unstructured data by indexing, searching and theorising. In addition, “it allows the researcher to manage documents and ideas easily, rigorously and flexibly, in symmetrical systems and it also helps the researcher to review the results of the coding qualitatively” (Lin, 2002).

3.9 Sample

In this study, the sample group is Thai senior educators from Thai universities. The size of the sample is difficult to gauge because factors, such as time, geography and change of address can possibly impose limitations. Therefore, the sampling was based on two methods; Purposive sampling and Availability sampling and only Thai senior educators living in Bangkok and its surroundings as far as possible were selected. The initial sample size of the survey was estimated at a minimum of 50 and a maximum of 100 respondents for the questionnaire survey and around 6 to attend an in-depth interview. However, in the real exploratory stage, respondents in the questionnaire survey totalled 160 and 8 interviewees attended in-depth interviews. The real sizes were more than the initial estimations which was good for it gives a broader range of respondents' opinions.
3.10 Language, translation and transcription

The language used during the data collection was Thai, the main language of the population. Using the local language helps the researcher and participants to act in rapport. It also helps them to express themselves comfortably. In Thailand people speak Thai and many seldom speak, read or listen to English. The researcher, a Thai national speaks and understands Thai therefore, the challenges of note-taking or meanings and symbolism of words used did not affect the methodology and results of the research.

The data collection tools, the questionnaire for and the interviews, were conducted in Thai, however, they were translated into English. Results from the survey, interviews and the research were also translated. The transcriptions and translations were done by the researcher and were also double-checked by a professional translator from Thai to English.

3.11 Reliability and validity

Reliability and validity are two important considerations in any type of research method (Leedy, 2001). Generally, reliability means the consistency of measurement, the degree to which an instrument measures the same way each time it is used under the same conditions with the same subjects (Hingston, 2003a) and validity means the accuracy of the instrument for the purpose of measurement (Leedy, 2001).

In this research, the validity of the measurement and the instruments were analysed based on the Content Validity method. This makes the tools valid because they use the information and knowledge based on textbooks, literature reviews, and formal surveys related to the study. Moreover, they were prepared by the researcher to obtain detailed information for successful processing. In addition, the research measurements were also checked by experts (Appendix D), specialists able to make comments on and give feedback about the research tools before a try-out (Gatesigh, 2002).
In addition, the measurement and the instruments were trialed out with a small similar sample group of 12 (pilot testing) and after which they were tested for reliability by using Cronbach’s Alpha technique (SPSS program). These techniques will contribute to the reliability and validity of the research measurements of this study before being used in the data collecting phase (see p. 37).

3.12 Ethical considerations

The awareness of ethical issues is an important aspect of any research that involves a human subject. A quote from Hingston (2003b) said “If you are going to do research, then you need to be aware of, and adhere to, the general agreements shared among researchers about what’s proper and improper in the conduct of scientific inquiry”.

As this research does not expose participants to undue physical harm, there is no reason to believe that the study would present any risk to the lives of the sample group. However, it deals with human beings and it focuses on the investigation of personal beliefs, attitudes, and needs. Ethical considerations therefore, are also paramount in all aspects starting from research design (the questions for the questionnaire and the interviews) to the fieldwork period and finally to the writing of the thesis. Informed consent was present as a precaution for all tools or methods involved in the particular issues above. The names and addresses of research participants were kept secret and be identified only by an alphanumerical code, rather than their names or addresses. Documentary records were stored in a locked filing cabinet in the researcher’s house in Thailand, the researcher being the only person with a key to the cabinet. The data on laptop were encrypted and protected by a password known only to the researcher. The data will be stored and retained for five years after the research project has been completed. They will be kept under the secure conditions mentioned above in Thailand after which they will be destroyed. The documents will be shredded and tapes of interviews wiped clean. Electronic data will be deleted by formatting and overwriting of the contents of the media using a file shredder software.

This enables sample groups to feel confident that the results of this study will not cause them any harm.
3.13 Conceptual framework

This study uses the mixed research method, using a selected sample group as a case study. The conceptual framework for the study is as follows:

- **Explore and investigate literature**
- **Designing and developing the tools**
- **Piloting**
- **Collecting the data**
  - **Questionnaire surveys**
  - **In-depth interviews**
- **Analysis of the results, conclusions and recommendations**

![Figure 3.1: Conceptual Framework](image)

**Explore and investigate**

This stage aims to understand the beliefs, attitudes, and goals of Thai senior educators by conducting a literature review, formal research on the topic area of older peoples' use of ICT, the benefits of ICT for older people, ICT in educational societies past, present, and future, ICT situations in Thailand and the ICT concerning seniors in Thailand. The information was collected from documents, textbooks, journals, newspapers, similar research articles, Government policy papers, National master plan data and information from electronic sources such as the World Wide Web. In addition, it included interviewing experts on the ICT topic in order to prepare the research tools.
Designing and developing the tools

The questionnaires and semi-structured interviews forms were designed based on the research aims and planned to cover all the research questions. Information from the literature was used in this stage. The questionnaires contained multiple choice questions, Likert scale questions and open-ended questions and consisted of 5 sections. The aim of each section was as follows:

Section 1: The participant's profile.
Section 2: To explore senior Thai educators' beliefs in using ICT for their professional goals.
Section 3: To explore senior Thai educators' attitudes in using ICT to achieve their professional goals.
Section 4: To explore the level of the senior Thai educators' needs of ICT to achieve their academic goals.
Section 5: To explore what ICT is suitable to support the senior Thai educators' goals.
Section 6: To explore the best way of learning how to use appropriate ICT in the senior Thai educators' life.

(see Appendices B and C)

The semi-structured interview form was used to obtain in-depth information from the particular sample and to supplement questionnaire data. Both questionnaires and semi-interview forms were examined by experts who are specialists in this particular field and able to make comments and give feedback on the research tools in order to measure content validity before the pilot test. The experts included four senior lecturers and a non-teaching researcher from a Thai university.

Ethical considerations of the research tools were reviewed and have been granted ethical approval by The ECU (Edith Cowan University) Human Research Ethics Committee (HREC). The comments were valuable for amendments which were incorporated into the final questionnaire. The Informed consent form and the information letters to participants were prepared as a precaution for both questionnaires and the interviews for pilot testing and real testing each time.
Pilot testing

The questionnaires were sent for sample pilot testing in Thailand in order to test the reliability of the tools. The feedback from the 21 samples was analyzed for reliability using the SPSS program. The results were very good and produced a very high reliability. Below are the reliability figures in Sections 2, 3 and 4 of the questionnaire which are the rating scale questions asking about beliefs, attitudes, and levels of their needs.

In Section 2: To explore senior Thai educators' beliefs in using ICT for their professional goals

Questions 2.1.1-2.1.4 = .8889  
Questions 2.2.1-2.2.6 = .9019  
Questions 2.3.1-2.3.7 = .8025  
Questions 2.4.1-2.4.6 = .9091

In section 3: To explore senior Thai educators' attitudes in using ICT to achieve their professional goals

Questions 3.1-3.10 = .9261

In section 4: To explore the level of the senior Thai educators' needs of ICT to achieve their academic goals

Questions 4.1-4.10 = .8733  
Total (Section 2-4) = .9070

However, Sections 1, 5 and 6 could not be tested for reliability because these sections were about profiles and some asked about facts, for instance, "What was your last or current educational position?", "How long do you think you want to continue to work?" or "Do you use ICT in your work time?" etc.

For the interview part, a small pilot sample was interviewed in Thailand and another relevant sample was obtained from Perth.

Collecting the data

This stage included 2 phases, the questionnaire survey and In-depth interviews. In the first phase, the results were analysed and in-depth interviews prepared for the next step.
Analysis of the results, conclusions and recommendations

This phase consists of Data analysis, conclusion and recommendations. Two different types of data, Quantitative data and Qualitative data, were analysed.

First, the results of the Quantitative data from the questionnaires included descriptive statistics data and correlation data. Descriptive statistics results illustrated the frequency and the percentage in order to compare the variables and the results and the correlation results showed the relationships between two or more variables in this study. The correlation technique used Pearson's $r$ technique to calculate and to find the magnitude of the relationship and its statistical significance. These particular data were analysed using computer software SPSS (version 11.0 for WINDOWS).

The Qualitative results from the interview and open-end questions were analysed via the NVivo program. These responses were collected as Word documents and imported as rich text where they were coded line by line into NVivo. This program has assisted the researcher and enhanced the analysis of qualitative data in combining subtle codes, linking the data and searching the data of the participants.

Finally, conclusions were reached and recommendations suggested at the end of this stage and can be found in Chapter 5.

3.14 Conclusions

The methodology used for this study was a mixed methods, a combination of the Quantitative method and the Qualitative method. The case study focus in this study was Thai senior educators from Thai universities who live in Bangkok and its surrounds. A Quantitative questionnaire was used in the first phase of the data collection with a sample size of 160 participants. The second phase was an In-depth Interview, a Qualitative method and 11 interviewees were selected. Pilot testing was carried out to test the reliability of the tools before real collection of the data. Copies of the questionnaire questions and the semi-structured interviews forms are in Appendices Band C.
CHAPTER 4
RESULTS

4.1 Introduction

This chapter will present the analysis of the results; quantitative data, questionnaire survey and the qualitative data, open-ended questions and in-depth interviews in order to answer each of the research questions. It contains two sections. First, the descriptive data of all participants and second, the results of the questionnaire survey will be reported using descriptive statistics relating to the goals and will cover all the research questions.

In addition, the qualitative results from the open-ended questions and the in-depth interviews of interviewees will provide answers to the research questions in more detail according to each research question in this section.

The procedure for the analysis of the interview transcripts was analyzed and using the computer software package NUD.IST NVivo.

4.2 Descriptive results: participants' questionnaire data

Out of the 220 questionnaires sent out, 160 were returned. The distributions of the demographic characteristics are summarized in Table 4.1 and Figure 4.1.
4.2.1 Gender

From the data above, it can be seen that the percentage of males and females were 42.5% and 52.9% respectively and 0.6% were of unknown gender. The percentage of the sexes between males and females is not very different which is good for balancing participants' opinions. It is also in line with the Thai population data relevant to this study. For example:

- According to data from the Department of Provincial Administration (Thailand) in 2005, the percentages of Thai males and females are 49.38% and 50.62% respectively (DOPA.Dep, 2005).

- The percentages of Thai seniors over 60 between males and females from 1993-1997 were 54.39% and 45.61%, 55.09% and 45.01%, 53.72% and 46.28%, 53.95% and 46.05% respectively (nso.go.th, 2005).

- In addition, the percentages of Thai males and females who graduated in education and teaching programs from Thai universities were 47.26% and 52.74% respectively (muango.th, 2005).
According to the Thai population data above and the numbers of participants in this study, the ratio of the percentages of Thai males to females in the data are not very different.

### 4.2.2 Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>63</td>
<td>38</td>
<td>23.8</td>
</tr>
<tr>
<td>62</td>
<td>63</td>
<td>33.1</td>
</tr>
<tr>
<td>61</td>
<td>38</td>
<td>23.8</td>
</tr>
<tr>
<td>60</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
<td>91.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.2: Ages of participants

In Figure 4.2, most of the senior educators in the sample were between 61-63. Even though 60 is the official age for retirement of Thai public servants, some still have the desire and ability to work and contribute to society.
4.2.3 Current position

In Figure 4.3, it can be seen that the last or current position of the senior educators in this sample were Associate Professors (45%) and Assistant Professors (36.9%) respectively which means most of the participants in this sample have a high level of knowledge, skills and experience in their fields.

4.3 Answering the Research Questions

In this section, the discussions are based on the two major research questions. The first concerns the professional goals of senior educators in Thailand. The second illustrates the beliefs of senior educators in Thailand regarding which is the best way for them to learn ICT.
The first major questions

4.3.1 Research Question I: "What are their professional goals?"

The methodology used to collect the data to explore the answer to this question is data collection from the questionnaire survey, data correlation of questions, and qualitative data from open-ended question and in-depth interviews.

4.3.1.1 Data collection from questionnaires

To answer this particular question, the 5 questions below from the questionnaire were used in the analysis as follows:

- Do you think your current skills and abilities can continue to be used to support your work in your professional life?
- Will you keep working to support your professional life?
- How long do you think you want to continue to work?
- Which of these activities are you currently doing that involve your educational skills and abilities?
  - Classroom lecturer
  - Instructional Aid design and development
  - Curriculum specialist
  - Special education lecturer
  - Administrator
  - Researcher
  - Academic writer
  - Consultant
  - Others
- Which of these activities do you intend to do in the future?
  - Classroom lecturer
  - Instructional Aid design and development
  - Curriculum specialist
  - Special education lecturer
  - Administrator
  - Researcher
  - Academic writer
  - Consultant
  - Others
Current skills and abilities

Figure 4.4: Current skills and abilities of senior educators to support their professional life

<table>
<thead>
<tr>
<th>Do you think your current skills and abilities can continue to be used to support your work in your professional life?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>132</td>
<td>82.5</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Not sure</td>
<td>23</td>
<td>14.4</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>98.8</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.4: Current skills and abilities of senior educators to support their professional life

From the results of the participants on this issue, Figure 4.4 and Table 4.4 show that 82.5% of the participants think their current skills and abilities can still be used to support their work in their professional life. Only 1.9% denied that their skills and abilities can assist in their work and 14.4% are not sure at the moment. This result confirms that the majority of senior educators in Thailand believe they are a good human resource able to use their knowledge, skills, and experience to assist society.
The question asks "Will they keep working to support their professional life?" The answers were; 68.1% will continue, 19.4% will not and 11.3% are still not sure whether to work or not to work. Most of them do not want to stop working even though they are retired. They desire to continue working in their professional life which is good both for the senior educators themselves and for society too.
How long do they think they want to continue working?

![Diagram showing the percentage of senior educators who want to continue working for different durations.

- 1-5 years: 36.3%
- 6-10 years: 26.9%
- As long as I can: 13.8%
- Don't want to work: 3.8%
- Missing: 27.5%

Table 4.6: How long do senior educators want to continue working?

<table>
<thead>
<tr>
<th>How long do they think they want to continue working?</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>58</td>
<td>36.3</td>
</tr>
<tr>
<td>6-10 years</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>As long as I can</td>
<td>43</td>
<td>26.9</td>
</tr>
<tr>
<td>Don't want to work</td>
<td>8</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>72.5</td>
</tr>
<tr>
<td>Missing</td>
<td>44</td>
<td>27.5</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Most senior educators who still work after retiring said they want to continue to work for 1-5 years (36.3%), 26.9% said they wanted to work as long as they could, 3.8% denied wanting to work. There were respondents who did not answer this question [Missing data] about 27.5%. The number of people in this particular group also included people who said in the previous question (Figure 4.5) that they will not keep working to support their professional life (15.6%).

However, the overall impression from these results is most senior educators do not want to stop working in their fields but intend to continue to use their knowledge, skills and experience to work even though they have already retired.
**Current activities of senior educators**

![Pie chart showing percent of responses for different roles](chart.png)

**Figure 4.7:** Currently what activities are senior educators doing that involve their educational skills and abilities?

<table>
<thead>
<tr>
<th>Question 1.5</th>
<th>Frequency</th>
<th>Percent of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Lecturer</td>
<td>39</td>
<td>9.9</td>
</tr>
<tr>
<td>Instructional Aid design and development</td>
<td>16</td>
<td>4.1</td>
</tr>
<tr>
<td>Curriculum Specialist</td>
<td>31</td>
<td>7.9</td>
</tr>
<tr>
<td>Part-time Lecturer</td>
<td>90</td>
<td>22.8</td>
</tr>
<tr>
<td>Administrator</td>
<td>20</td>
<td>5.1</td>
</tr>
<tr>
<td>Researcher</td>
<td>37</td>
<td>9.4</td>
</tr>
<tr>
<td>Academic writer</td>
<td>53</td>
<td>13.5</td>
</tr>
<tr>
<td>Consultant</td>
<td>82</td>
<td>20.8</td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>394</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Table 4.7:** Currently what activities are senior educators doing that involve their educational skills and abilities?

From Figure 4.7, it can be seen that the two most popular areas senior educators are currently involved in are special education lecturers and consultants (22.8% and 20.8% respectively). Further 13.5% were academic writers. Classroom lecturers and researchers were 9.9% and 9.4%. The minimum percentages of responses selected for administrators and instructional aid design and development were 5.1% and 4.1%. From the results, it can be seen that after retiring, senior educators still keep working in a range of academic fields.
Future activities senior educators intend to do

Which of these activities do you intend to do in the future?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Percent of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom lecturer</td>
<td>23</td>
<td>6.4</td>
</tr>
<tr>
<td>Instructional Aid design and development</td>
<td>16</td>
<td>4.4</td>
</tr>
<tr>
<td>Curriculum Specialist</td>
<td>21</td>
<td>5.8</td>
</tr>
<tr>
<td>Special Education Lecturer</td>
<td>88</td>
<td>24.3</td>
</tr>
<tr>
<td>Administrator</td>
<td>14</td>
<td>3.9</td>
</tr>
<tr>
<td>Researcher</td>
<td>41</td>
<td>11.4</td>
</tr>
<tr>
<td>Academic writer</td>
<td>51</td>
<td>14.2</td>
</tr>
<tr>
<td>Consultant</td>
<td>79</td>
<td>21.9</td>
</tr>
<tr>
<td>Others</td>
<td>28</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>361</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.8: Activities that senior educators intend to do in the future

The activities senior educators intend to do in the future according to Figure 4.8 are special education lecturers and consultants 24.4% and 21.9% respectively. 14.1% of responses said they intend to be academic writers, whereas 11.4% want to be researchers. The researcher noticed the minimum percentages of responses are 4.4% and 3.9% for administrators and instructional aid design and development. In addition, the results also indicate that most like to work as lecturers (including classroom lecturers and part time lecturers) therefore it can be said that teaching, the main activity of all educators, is still their favorite occupation.
A comparison of the percentages between each current activity of senior educators and each activity that they intend to do in future from Figure 4.9 shows the ranges are similar. Most activities senior educators wish to do in the future remain the same as at present. However, the percentages of three future activities are lower than before: Classroom lecturers, Curriculum specialists, and Administrators. This is perhaps because the work loads and time schedules need to be considered more than other activities, for example, classroom teaching, curriculum specialists and administrators as they impact on their personal time as retirees.
4.3.1.2 Data correlation

Data correlations represent the relationships of two variables. The following shows the inter-correlation matrix of the data participants provided for each question. These data will be used to answer Research Question 1: What are Thai senior educators' professional goals.

The inter-correlation matrix between:

Question 1.2: Do you think your current skills and abilities can continue to be used to support your work in your professional life?

Question 1.3: Will you keep working to support your professional life? If yes, please describe your professional goals.

Correlations

<table>
<thead>
<tr>
<th></th>
<th>Q1.2</th>
<th>Q1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1.2</td>
<td>1</td>
<td>0.395***</td>
</tr>
<tr>
<td>Q1.3</td>
<td>0.395***</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

(\(r = 0.395, p = 0.001\))

Table 4.9 Correlation of two variables

From the correlation coefficients shown in Table 4.9, both variables (Questions 1.2 and 1.3) have a positive correlation \((r = 0.395, p = 0.001)\), that means senior educators who think that their current skills and abilities can continue to be used to support their work in their professional life are willing to keep working.
In addition, there is a strong positive correlation among the current activities of
the participants and the activities they intend to do in the future. The correlation matrix
table, Table 4.9a, is as follows:

<table>
<thead>
<tr>
<th>Future activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.721***</td>
<td>.019</td>
<td>0.23</td>
<td>-0.109</td>
<td>0.006</td>
<td>0.197*</td>
<td>0.202*</td>
<td>0.077</td>
</tr>
<tr>
<td>2</td>
<td>0.005</td>
<td>0.722***</td>
<td>0.047</td>
<td>-0.042</td>
<td>-0.063</td>
<td>-0.035</td>
<td>0.120</td>
<td>0.033</td>
</tr>
<tr>
<td>3</td>
<td>0.048</td>
<td>0.056</td>
<td>0.746***</td>
<td>-0.082</td>
<td>0.133</td>
<td>0.182*</td>
<td>0.198*</td>
<td>0.194*</td>
</tr>
<tr>
<td>4</td>
<td>0.075</td>
<td>-0.034</td>
<td>0.157*</td>
<td>0.747***</td>
<td>0.000</td>
<td>0.109</td>
<td>0.210**</td>
<td>0.374**</td>
</tr>
<tr>
<td>5</td>
<td>-0.073</td>
<td>-0.106</td>
<td>0.184*</td>
<td>0.050</td>
<td>0.619***</td>
<td>0.012</td>
<td>-0.017</td>
<td>0.169*</td>
</tr>
<tr>
<td>6</td>
<td>0.234**</td>
<td>-0.003</td>
<td>0.929**</td>
<td>-0.171*</td>
<td>-0.124</td>
<td>0.731***</td>
<td>0.286**</td>
<td>0.259**</td>
</tr>
<tr>
<td>7</td>
<td>0.299**</td>
<td>-0.130</td>
<td>0.242**</td>
<td>0.225*</td>
<td>0.046</td>
<td>0.197*</td>
<td>0.773***</td>
<td>0.291**</td>
</tr>
<tr>
<td>8</td>
<td>-0.009</td>
<td>0.004</td>
<td>0.275**</td>
<td>0.367***</td>
<td>0.269**</td>
<td>0.170*</td>
<td>0.314**</td>
<td>0.788***</td>
</tr>
</tbody>
</table>

Table 4.9a Correlation matrix of the current activities of the participants
and the activities they intend to do in the future

1 = Classroom lecturer
2 = Instructional Aid design and development
3 = Curriculum specialist
4 = Part time lecturer
5 = Administrator
6 = Researcher
7 = Academic writer
8 = Consultant

From Table 4.9a, it can seen that the correlation between current activities and
the activities that each person intends to do in the future have strong positive
correlations which mean most senior educators would still like to continue doing the
same thing in future.

For example, most senior educators whose current activity is classroom teaching
intend to continue it in future (r = 0.721, p = 0.001).
4.3.1.3 Qualitative data collection

The qualitative data collection consists of open-ended question and in-depth interviews.

- The open-ended question

To explore senior educators' opinions in more detail, the questionnaire survey provided open-ended question in order to obtain supplementary information to support this particular research question. The question was "Will you keep working to support your professional life? If yes, please describe what your professional goals are?"

Participants who said that they would keep on working to support their professional life described their professional goals and some of their opinions in the open-ended Question 1.3. The opinions of senior educators about their professional goals can be summarized in two groups as follows:

Firstly, the professional goals that provides benefits directly for themselves. This also includes their personal preferences.

Example opinions such as:

"I hope to develop my general knowledge"
"I would like to be an academic writer"
"I would like to be an advisor"
"I like to be a lecturer"
"I would like to continue developing my performance"
"I will develop myself for the new technology"

Secondly, the professional goals providing benefits for themselves and society were expressed as follows:

"I publicize my experience by writing articles for the Engineering Society Association"

"I provide knowledge and experience to the youth in order to help them to be effective persons in society"

"I use my skills and abilities to work for society"
"I would like to publicize my experience"

"I would like to explore the new know-how and apply it to my present experience and make it available to the new generation"

"I would like to be a lecturer for general people and people who lack education"

"I would like to do research and to evaluate Government projects and private organizations"

"I will provide knowledge to students and general people"

"I intend to provide knowledge in education for society"

"I would like to develop people in society so that they can gain knowledge and use it"

"I want to provide knowledge for society and young people in order to make them good persons for the country"

"I intend to provide my knowledge and experience for the public"

"I am seeking new knowledge and would like to provide it to students as much as I can"

- In-depth Interviews

Eight participants took part in the in-depth interviews. The details of which are in the following table:

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Gender</th>
<th>Job/Position before retiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee A</td>
<td>Female</td>
<td>A former university vice president</td>
</tr>
<tr>
<td>Interviewee B</td>
<td>Female</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee C</td>
<td>Male</td>
<td>A formal university lecturer/ Asst. Prof.</td>
</tr>
<tr>
<td>Interviewee D</td>
<td>Female</td>
<td>A formal university lecturer/ Asst. Prof.</td>
</tr>
<tr>
<td>Interviewee E</td>
<td>Male</td>
<td>A formal university lecturer/ Asst. Prof.</td>
</tr>
<tr>
<td>Interviewee F</td>
<td>Male</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee G</td>
<td>Female</td>
<td>A former university lecturer</td>
</tr>
<tr>
<td>Interviewee H</td>
<td>Male</td>
<td>A formal university lecturer/ Asst. Prof.</td>
</tr>
</tbody>
</table>

Table 4.9b Brief of interview respondents' backgrounds
The interviews were particularly useful in seeking in depth information to support and answer research questions. The questions were a semi-interview transcripts form and in this issue, interviewees were asked their opinions about life after retirement. They were guided by the following sub-questions on:

- Workstatus
- Work detail
- Motivation

Workstatus

The interviewer asked about the work status of the participants and answers indicated they would all like to continue working in their academic fields or other fields and use their academic knowledge, skills and experience. However, they did not wish to have a 100% work load as they did before retiring.

This is an example of the interview question

"...From your feedback, I know that you have already retired, however you are still working in the academic field aren't you?"

Here are examples of interviewees' responses,

"Yes I am but only 1 day a week. Um I also am an advisor for a factory"
(Interviewee H, a male Assistant professor)

"Yes, I teach at Master Degree level"
(Interviewee A, a female former university Vice President)

"Yes, a little bit"
(Interviewee B, a female senior university lecturer)

"Yes, I am. I still teach regularly as a part time lecturer for 3 universities"
(Interviewee D, a female Assistant professor)

"After retiring, I taught for 3 years. Now I have just stopped my teaching, however, I will take it up again if I am required"
(Interviewee E, a male Assistant professor)

"Yes, I still teach at the university"
(Interviewee G, a female senior university lecturer)
Work details

The interviewer asked about their kind of job and if it was similar to the job they did before retirement or not.

The interview questions were:

"What is your job about?"
And "Is your job similar to the jobs you had before retiring?"

Examples of interviewees' responses were:

"Not at all but some things are similar. I apply my knowledge and experience to work for the factory"  
(Interviewee H, a male Assistant professor)

"After retiring, I have been a part time lecturer and Masters Degree's advisor and also write academic text books,"
(Interviewee G, a female senior university lecturer)

"I am a part time lecturer, a trainer, and work for the financial department in my university." ....Some things are similar, for example, being a lecturer and an advisor for the new colleges."  
(Interviewee C, a male Assistant professor)

"I am a technical advisor for an industrial company and advise on students' projects,..."  
(Interviewee B, a female senior university lecturer)

"I use a computer to develop computer software, create a website by using HTML, and am now writing 2 academic text books about computer application software." .... I have stopped teaching for a while because I have to take care of my grandchildren. However, when they grow up I may go back to teach again because my faculty is asking me to help them again. Whenever I have time, I will be back."

(Interviewee F, a male senior university lecturer)
Motivation

The participants also explained what motivated them to work even though they had already retired. Their motivation can be divided into 4 factors:

Factor 1: The convenience
An example of an interviewee's response:

"Umm it so happens that it is convenient. Everything is there so I like to work."
(Interviewee H, a male Assistant professor)

Factor 2: Professional dedication
Examples of interviewees' responses:

"Whatever I have learnt I would like to let other people know as well. I do not want to keep it only for myself."
(Interviewee B, a female senior university lecturer)

"I would like to transfer my knowledge, skill and experience to the new generation as long as I can because these things if I keep them to myself, I will forget and the knowledge will be lost. Therefore, as I still can work, I will work and provide knowledge according to their requests."
(Interviewee F, a male senior university lecturer)

"I love being a teacher so much. When I had just graduated, I worked for international organization and my family and I had many chances to go abroad for work and study. I obtained a great deal of knowledge and experience from this and I would like to share my experience with other people and my students. I would like them to have an opportunity like me and would like to see them to be good members of society."
(Interviewee A, a female former university vice president)

"I would like to provide knowledge from my experience for my students. Now I am doing just that."
(Interviewee G, a female senior university lecturer)

"I still have enough energy therefore, if there is anything helpful that I can do for society, I am happy to do it."
(Interviewee C, a male Assistant professor)
"I like to work and learn new things."

(Interviewee D, a female Assistant professor)

**Factor 3: Concern for their students.**
Examples of interviewees' responses:

"I am thinking of my students, I would like to provide them with knowledge. That is what I want to do."

(Interviewee H, a male Assistant professor)

**Factor 4: Personal beliefs.**
Examples of interviewees' responses:

"I believe in that if we give our knowledge freely, then we will receive good things back."

(Interviewee B, a female senior university lecturer)

"I am a person who wants to teach because when I teach somebody else, I also practise and gain knowledge too."

(Interviewee H, a male Assistant professor)

### 4.3.1.4 Summary

The results in this part are from the questionnaire, data correlation of questions, and the qualitative data from open-ended question and in-depth interviews provide answers for research Question 1 showing:

- The majority of senior educators believed that their current skills and abilities can continue be used to support their work in their professional life and they are willing to keep working.

- Most of them think they have the ability to work and want to continue working at least 5 years or as long as they can.

- After retiring, senior educators still use their knowledge, skills and experience to support their activities in both current and future activities.
• Most of their activities are similar to those they did before retiring but their work load is less.

• Professional goals include professional goals that benefit themselves and society.

• The participants detailed the motivation that led them to continue working in categories such as convenience, professional dedication, concern for students, and personal beliefs.
4.3.2 Research Question 2:

"What are their attitudes about using ICT to achieve their professional goals?"

In order to explore the attitudes of senior educators about using ICT to achieve their professional goals, two methodologies, data collection from the questionnaire surveys (Likert scale forms) and data correlation, were used to collect and analyse the data. The results of the two methods are described in more detail below.

4.3.2.1 Data collection from questionnaires

The 10 Likert scale questions from the questionnaire 3.1-3.10 in Section 3 indicate the attitudes of senior educators to using ICT to achieve their goals. The lists of questions and the results in this particular section are as follows.

Section 3, the questions indicate how much you agree or disagree with the following statements. The numbers 1-5 that respondents put beside each statement most accurately reflect their views.

- 5 = strongly agree
- 4 = agree
- 3 = neither agree nor disagree
- 2 = disagree
- 1 = strongly disagree

- Question 3.1 Computers and the Internet now play great roles in education
- Question 3.2 ICT is only suitable for younger people
- Question 3.3 Everybody should know how to use a computer and the Internet
- Question 3.4 Educators should know how to use computers and the Internet
- Question 3.5 Using ICT helps me to gain more skills, experience, and better performance in my profession goals
- Question 3.6 ICT will provide more advantages for my professional life than disadvantages
- Question 3.7 I am quite familiar with using ICT in my professional life
- Question 3.8 ICT is not hard to use if I have a good advisor to guide me
- Question 3.9 I should not fear using ICT
- Question 3.10 The computer and the Internet are important in supporting my academic goals
Computers and the Internet now play great roles in education

Figure 4.10: How much senior educators agree or disagree with
"Computers and the Internet now play great roles in education"

<table>
<thead>
<tr>
<th>Question 3.1</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>133</td>
<td>83.1</td>
</tr>
<tr>
<td>4 agree</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.10: How much senior educators agree or disagree with
"Computers and the Internet now play great roles in education"

Figure 4.10 shows the attitudes of senior educators to the statement “Computers and the Internet now play great roles in education”. Most strongly agree (83.1%), a few hold other opinions but no one selected “strongly disagree”. This shows that nowadays senior educators believe ICT plays an important role and has an influence on education.
ICT is only suitable for younger people

![Figure 4.11: How much senior educators agree or disagree with "ICT is only suitable for younger people"](image)

**Table 4.11: How much senior educators agree or disagree with "ICT is only suitable for younger people"**

<table>
<thead>
<tr>
<th>Question 3.2</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>4 agree</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>26</td>
<td>16.3</td>
</tr>
<tr>
<td>2 disagree</td>
<td>44</td>
<td>27.5</td>
</tr>
<tr>
<td>1 strongly disagree</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>96.3</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Regarding the assertion "ICT is only suitable for young people", from Figure 4.11 it can be seen that 35% of respondents strongly disagree and 27.5% agree with "ICT is only suitable for younger people". However, some respondents are still not sure (16.3%) and some either considered it is not suitable or strong not suitable for them but this number of people constituted only a small percentage overall, 11.9% and 5.6% respectively. The results show there is a strong trend among senior educators towards accepting that new technology is not only for specific groups of people, for instance, younger people, but may be suitable for anyone who is interested in it.
Everybody should know how to use a computer and the Internet

Figure 4.12: How much senior educators agree or disagree with
"Everybody should know how to use a computer and the Internet"

<table>
<thead>
<tr>
<th>Question 3.3</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>69</td>
<td>43.1</td>
</tr>
<tr>
<td>4 agree</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>19</td>
<td>1.9</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155</strong></td>
<td><strong>96.9</strong></td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td><strong>5</strong></td>
<td><strong>3.1</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>160</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 4.12: How much senior educators agree or disagree with
"Everybody should know how to use a computer and the Internet"

Most senior educators either strongly agree or agree that everybody should know how to use a computer and the Internet (43.1% and 41.3% respectively). This result supports the results in Figures 4.10 and 4.11 that ICT is now important and everyone should know how to use it. Therefore, there is no doubt why the percentage of people who disagree with this statement is very low (0.6%) and nobody selected “strongly disagree” (0%).
Educators should know how to use computers and the Internet

Figure 4.13: How much senior educators agree or disagree with
"Educators should know how to use computers and the Internet"

<table>
<thead>
<tr>
<th>Question 3.4</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>120</td>
<td>75</td>
</tr>
<tr>
<td>4 agree</td>
<td>32</td>
<td>20</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>96.3</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.13: How much senior educators agree or disagree with
"Educators should know how to use computers and the Internet"

The results to this particular question in Figure 4.13 show that most senior educators agree with "Educators should know how to use computers and the Internet". The percentages of respondents who strongly agreed and agree are 75% and 20% respectively. Again, a few respondents disagreed (1.3%) and no one strongly disagreed (0%) with this statement. This result shows that these senior educators believe all people in education should know how to use ICT.
Using ICT helps me to gain more skills, experience, and better performance in my professional goals.

Figure 4.14: How much senior educators agree or disagree with “Using ICT helps me to gain more skills, experience, and better performance in my professional goals.”

<table>
<thead>
<tr>
<th>Question 3.5</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>Agree</td>
<td>57</td>
<td>35.0</td>
</tr>
<tr>
<td>Neither agree nor disagree</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.14: How much senior educators agree or disagree with “Using ICT helps me to gain more skills, experience, and better performance in my professional goals.”

Figure 4.14 shows 48.8% of respondents strongly agree that using ICT can help them to gain more skills, experience, and better performance in their professional goals. Only 2% disagree and 0% strongly disagree with this statement. This means senior educators think ICT is useful for achieving their professional goals.
ICT will provide more advantages for my professional life than disadvantages

![Chart showing percentage distribution of agreement or disagreement with ICT providing more advantages than disadvantages.]

Figure 4.15: How much senior educators agree or disagree with

"ICT provides more advantages for my professional life than disadvantages"

<table>
<thead>
<tr>
<th>Question 3.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>4 agree</td>
<td>57</td>
<td>35.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>2 disagree</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.15: How much senior educators agree or disagree with

"ICT provides more advantages for my professional life than disadvantages"

Figure 4.15 shows 43.8% of respondents strongly agree and 35.6% agree that ICT provides more advantages than disadvantages for their professional life. Just a few people dispute this statement but the percentage is very low. In addition, no one strongly disagreed with this particular statement (0%). From these results, it can be seen that even though some people think ICT may have some weaknesses, the attitude of the majority of senior educators is it provides them with more advantages than disadvantages.
I am quite familiar with using ICT in my professional life

Figure 4.16: How much senior educators agree or disagree with
"I am quite familiar with using ICT in my professional life"

<table>
<thead>
<tr>
<th>Question 3.7</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>31</td>
<td>19.4</td>
</tr>
<tr>
<td>4 agree</td>
<td>54</td>
<td>33.8</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>2 disagree</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>1 strongly disagree</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.16: How much senior educators agree or disagree with
"I am quite familiar with using ICT in my professional life"

The percentages of respondents who agree and who neither agree nor disagree for this particular question do not show a wide gap. Figure 4.16 shows even though the most respondents agree that they are quite familiar with using ICT in their professional life (33.8%), however, 28.1% of respondents are still not sure whether they agree or disagree with this or not. On the other hand some respondents disagree (9.4%) and strongly disagree (5%) as well. This result can be interpreted to mean that not all senior educators are familiar with ICT; some are still not familiar with it at all.
ICT is not hard to use if I have a good advisor to guide me

Figure 4.17: How much senior educators agree or disagree with 
"ICT is not hard to use if I have a good advisor to guide me"

<table>
<thead>
<tr>
<th>Question 3.8</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>59</td>
<td>36.9</td>
</tr>
<tr>
<td>4 agree</td>
<td>73</td>
<td>45.6</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>19</td>
<td>11.9</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.17: How much senior educators agree or disagree with 
"ICT is not hard to use if I have a good advisor to guide me"

Figure 4.17 shows 45.6% agree and 36.9% strongly agree that ICT is not hard for them to use if they have a good advisor. Respondents who are not sure whether to agree or disagree are 11.9%. Only 1 person disagrees and no one strongly disagrees with this statement. This result means senior educators think it is not hard for them to learn ICT if they have an advisor. On the other hand, providing a good advisor is no guarantee he/she will help them learn ICT because the majority of respondents agree but not strongly agree with this statement.
I should not fear using ICT

Figure 4.18: How much senior educators agree or disagree with "I should not fear using ICT"

<table>
<thead>
<tr>
<th>Question 3.9</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly agree</td>
<td>67</td>
<td>41.9</td>
</tr>
<tr>
<td>4 agree</td>
<td>61</td>
<td>38.1</td>
</tr>
<tr>
<td>3 neither agree nor disagree</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>2 disagree</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>1 strongly disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.18: How much senior educators agree or disagree with "I should not fear using ICT"

Figure 4.18 shows 41.9% of respondents strongly agree and 38.1% agree that they should not fear to use ICT. Even though 13.8% neither agree nor disagree, only 0.6% disagree and 1.3% strongly disagree with this point. From these results, the trend is, 80% of them agree which means they are ready to learn ICT without fear of the new technology.
The computer and the Internet are important in supporting my academic goals

Figure 4.19: How much senior educators agree or disagree with

"The computer and the Internet are important in supporting my academic goals"

<table>
<thead>
<tr>
<th>Question 3.10</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>14.4</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.5</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.19: How much senior educators agree or disagree with

"The computer and the Internet are important in supporting my academic goals"

Figure 4.19 shows 41.3% of respondents agree and 3.3% strongly agree that the computer and the Internet are important in supporting their academic goals. Some respondents neither agree nor disagree with this point (14.4%) while 3.8% and 1.3% disagree and strongly disagree respectively. From these results it can be seen that the majority of senior educators agree and strongly agree that ICT such as the computer and the Internet are important for their jobs. These results are also in line with the previous results (Figures 4.10-4.15).
4.3.2.2 Data correlation

In order to acquire clear answers to the research questions “What are their attitudes about using ICT to achieve their professional goals?” data correlations in this particular section analyzed the attitudes of participants among the different variables. The details are described in the following section:

The inter-correlation matrix of how much they agree or disagree with each statement among Question 3.1: Computers and the Internet now play great roles in education and the following questions:

- Question 3.3: Everybody should know how to use a computer and the Internet
- Question 3.4: Educators should know how to use computers and the Internet
- Question 3.5: Using ICT helps me gain more skills, experience, and better performance in my profession goals
- Question 3.6: ICT will provide more advantages for my professional life than disadvantages

Correlations

<table>
<thead>
<tr>
<th></th>
<th>Q3.3</th>
<th>Q3.4</th>
<th>Q3.5</th>
<th>Q3.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson’s Correlation (2-tailed)</td>
<td>.739***</td>
<td>.803***</td>
<td>.616***</td>
<td>.728***</td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

Table 4.19a Correlation of two variables

The table of the correlation coefficients shows the results from Question 3.1 have positive correlations with Question 3.3, 3.4, and 3.5 (r = .739, p = .001), (r = .803, p = .001), (r = .616, p = .001), and (r = .728, p = .001) respectively. From these results, it can be seen that senior educators who agree computers and the Internet now play great roles in education also agree that it provides more advantages for their professional life than disadvantages. They also believe that using ICT can help them to gain more skills, experience, and achieve better performance in their profession goals. Finally, they think everybody should know how to use a computer and the Internet, and in particular, senior educators.
4.3.2.3 Summary

The results in this section showed that the attitudes of senior educators about using ICT to achieve their professional goals tend to be positive. The results of the data collection from the questionnaires can be summarized as follows:

Senior educators in Thailand believe:

- Computers and the Internet now play great roles in education
- ICT is not just suitable for younger people
- Everybody should know how to use a computer and the Internet
- Educators should know how to use computers and the Internet
- Using ICT helps them to gain more skills, experience, and achieve better performance in their professional goals
- ICT will provide more advantages for their professional life than disadvantages
- Not all of senior educators are familiar with ICT, some are still not familiar with it.
- ICT is not hard to use if they have a good advisor to guide them but it may not be enough because some are not sure that providing an advisor will help them to learn ICT or not.
- They are not afraid of using ICT
- The computer and the Internet are important in supporting their academic goals

In addition, there are positive correlations between senior educators' attitudes to the statements “Computers and the Internet now play great roles in education” “Everybody should know how to use a computer and the Internet”, “Educators should know how to use computers and the Internet”, “Using ICT helps me to gain more skills, experience, and better performance in my professional goals”, and “ICT will provide more advantages for my professional life than disadvantages” (r = .739, p = .001), (r = .773, p = .001), (r = .616, p = .001), and (r = .728, p = .001) respectively.
4.3.3 Research Question 3:

"How much do they [Thai senior educators] believe ICT can help?"

This section investigates the beliefs of Thai senior educators with regard to how much ICT can help them.

To seek how much they believe ICT can help, the questions asked were classified into eight parts.

- The first and second parts focused on how much they believe ICT assists them to achieve their goals.
- The third part concerned hindrances and how much they believe these will obstruct them in using ICT to achieve their goals.
- Part four asked how strongly they believe it will encourage them to use ICT.
- Part five asked senior educators how ICT can help them if they were once familiar with it.
- Parts six and seven asked how much they believe using ICT can help and if they have an opportunity to use it, do they believe it can help them to achieve their professional goals or not.
- The final part sought their views on how ICT can benefit current education.

The results in this particular section will answer Research Question 3 “How much do they [Thai senior educators] believe ICT can help?”
4.3.3.1 Data collection from questionnaires

The beliefs of Thai senior educators how ICT can assist in the accomplishment of their professional goals

![Figure 4.20: How much do they [Thai senior educators] believe that ICT assists in the accomplishment of their professional goals?](image)

### Question 2.1

<table>
<thead>
<tr>
<th>How much do you believe that ICT assists in the accomplishment of your professional goals?</th>
<th>Using ICT can save working time</th>
<th>Using ICT increases working convenience</th>
<th>Using ICT enables work to be done more efficiently</th>
<th>Using ICT increases work capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly believe</td>
<td>66.3%</td>
<td>68.8%</td>
<td>50%</td>
<td>59.4%</td>
</tr>
<tr>
<td>Believe</td>
<td>27.5%</td>
<td>25%</td>
<td>41.3%</td>
<td>31.9%</td>
</tr>
<tr>
<td>Neither believe nor not believe</td>
<td>2.5%</td>
<td>1.9%</td>
<td>4.4%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Not believe</td>
<td>0.6%</td>
<td>1.3%</td>
<td>0.6%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>96.9%</td>
<td>96.9%</td>
<td>96.3%</td>
<td>96.9%</td>
</tr>
<tr>
<td>Missing</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.20: How much do they [Thai senior educators] believe that ICT assists in the accomplishment of their professional goals?
From the feedback of Thai senior educators acquired through the questionnaire, it can be seen that their beliefs about using ICT to accomplish their goals are very positive. Figure 4.20 shows most respondents believe that using ICT can save their working time (66.3%), increase their working convenience (68.8%), enable their work to be done more efficiently (50%), and increase their work capability (59.4%). In contrast, the percentages of respondents who are uncertain are very low and only a few do not believe ICT can help them in these particular points (0.6%, 1.3%, 0.6%, and 0% respectively). None strongly do not believe, the so points to be true:

The beliefs of Thai senior educators in using ICT.

Figure 4.21: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals?
The results from the six statements in this part described respondents' opinions about using ICT to achieve their professional tasks. They suggest that in most of the task activities, the majority of respondents strongly believe ICT can help to customize their own resources to support their teaching (51.3%), allow them to communicate with other people easily (51.9%), enable them to be inspired and motivated by new and innovative methods of learning (41.3%), and can improve learning and teaching (46.9%). In designing their own educational aids and to enable them follow students' progress, the majority of respondents did not strongly believe ICT can help, but they still believe ICT can help (41.9% and 31.9% respectively). In this part, there were only two task activities that the respondents said they strongly did not believe. First using ICT enables you to design your own educational aids and second, using ICT allows you to follow your students' progress (0.6% and 2.5% respectively).
How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?

![Figure 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?](image)

### Table 4.22: How much do Thai senior educators believe the following statements obstruct them in using ICT for their professional goals?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Believe</th>
<th>Believe</th>
<th>Neither Believe nor Not Believe</th>
<th>Not Believe</th>
<th>Strongly Not Believe</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not own/have ICT facilities or devices</td>
<td>25.6%</td>
<td>20%</td>
<td>17.5%</td>
<td>15.6%</td>
<td>15%</td>
<td>93.8%</td>
</tr>
<tr>
<td>Afraid/back confidence to use it</td>
<td>13.8%</td>
<td>17.5%</td>
<td>28.8%</td>
<td>22.5%</td>
<td>22.5%</td>
<td>94.4%</td>
</tr>
<tr>
<td>Costly</td>
<td>13.8%</td>
<td>29.4%</td>
<td>31.9%</td>
<td>25.1%</td>
<td>18.1%</td>
<td>94.4%</td>
</tr>
<tr>
<td>Have tried but did not enjoy it</td>
<td>7.5%</td>
<td>10.6%</td>
<td>31.9%</td>
<td>21.3%</td>
<td>21.1%</td>
<td>93.8%</td>
</tr>
<tr>
<td>Have a disability that makes it difficult</td>
<td>8.8%</td>
<td>16.3%</td>
<td>28.8%</td>
<td>21.9%</td>
<td>24.4%</td>
<td>94.4%</td>
</tr>
<tr>
<td>Have no interest</td>
<td>6.9%</td>
<td>10.6%</td>
<td>25.6%</td>
<td>26.9%</td>
<td>23.1%</td>
<td>93.1%</td>
</tr>
<tr>
<td>Not enough time</td>
<td>5%</td>
<td>15%</td>
<td>30.6%</td>
<td>23.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 100%
The results in this part consisted of seven statements that concerned barriers and how much Thai senior educators believe they could be obstructed by using ICT for their professional goals. These statements are shown in Figure 4.22 and can be interpreted as follows:

First, if Thai senior educators do not have their own ICT facilities or ICT devices, it will be very hard for them to use or learn how to use ICT to achieve their goals. In Figure 4.22 high percentages of respondents strongly believe that this particular statement will be a barrier for them to use it for their professional goals (25.6%).

Second, regarding fear of and lacking confidence in using ICT which can cause obstruction, 20% believed and 13.8% strongly believed in this statement. However, it was not a serious point because the majority neither believe nor do not believe (28.8%), which implies that if they are afraid/lack confidence, they can still use it.

The third statement refers to the cost of using ICT. The results in this statement are similar to the results in statement two [afraid/lack confidence to use ICT]. Most respondents are uncertain or do not use it if the cost is high.

For the fourth statement, the results showed (Figure 4.22) that the majority of respondents said that they neither believe nor do not believe. If Thai senior educators tried to use ICT but did not enjoy it, it would be a barrier for them to achieve their goals. This applies to 18% of the respondents in this study.

As in statement four, the results in statement five show that if they have a disability that makes it difficult for them to use it, most respondents still neither believe nor do not believe it will be a barrier for them to use ICT.

In statement six, most respondents do not think that if they have no interest in ICT, it will stop them using it. According to Figure 4.22, 269% of respondents strongly do not believe and 24.4% do not believe in this particular point.

The results in the last statement show that most respondents neither believe nor do not believe it will be an obstruction to use ICT if they do not have enough time.
According to the results from Figure 4.22, the highest percentages from the respondents chose neither believe nor not believe in this particular statement (30.6%).

From the statements in this part, it can be seen that the most important obstruction for their use of ICT is that they do not own / have ICT facilities or devices.

How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?

Figure 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?
Table 4.23: How strongly do Thai senior educators believe the following statements would encourage them to use ICT to achieve their professional goals?

This part concerns how strongly Thai senior educators believe the statements provided would encourage them to use ICT to achieve their professional goals. The particular statements are:

1. Better learning/education facilities to help me learn ICT
2. If I had more time,
3. If costs were reduced
4. If it were a more convenient way to learn ICT,
5. If it would expose me to more education facilities,
6. If I had someone to train me.

The results shown in Figure 4.23 can be interpreted as follows.

Most respondents strongly believe that if learning to use ICT is good or if there are good facilities, they are willing to use it to support their professional goals. The percentages of respondents who either strongly believe or believe in this issue are 53.8% and 36.3% respectively. In addition, no respondents do not believe or strongly do not believe in this point (0%).
The second statement asked about time and it can be seen that most respondents strongly believe time is another factor to encourage them to use ICT. Regarding the results in the previous part, most respondents neither believe nor not believe if they do not have enough time it will be an obstruction for them to use ICT. On the other hand, this particular result showed that if they have more time to become familiar with ICT, they said they strongly believe as this will encourage them to use it.

The third statement focused on reducing the cost of ICT. The results seem similar to the previous statement. They said they were uncertain to use or not use ICT if it were costly. However, if there is a reduction in cost, most respondents strongly believe this factor will encourage them to use it.

The fourth statement asked respondents if they were provided with a more convenient way of learning ICT, how much they strongly believe this would encourage them to use ICT. The results showed 44.4% strongly believe and 36.9% believe it can encourage them to use ICT.

Statement 5 referred to most senior educators' beliefs and strong beliefs, 41.3% and 42.5% respectively that if there is exposure to more education facilities, they will be willing to use ICT.

The last statement asked respondents if they were provided with someone to train them whether it would encourage them to use ICT or not. The results showed that most strongly believe this will encourage them to use ICT. Most respondents said they strongly believe (46.9%). In contrast, respondents who do not believe and strongly do not believe were only 4.4% and 2.5% respectively.
Once you are familiar with using ICT, do you believe it will help you to achieve your professional goals more easily?

![Pie chart](image)

Figure 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals?

<table>
<thead>
<tr>
<th>Question 2.5</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>132</td>
<td>82.5</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Not sure</td>
<td>20</td>
<td>12.5</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.24: Once they are familiar with using ICT, how strongly do Thai senior educators believe it will help them to achieve their goals?

The question in this part asked Thai senior educators, both familiar and unfamiliar with ICT, that if once they were familiar with it do they believe it can assist them to achieve their goals or not. The results in Figure 4.24 show that 82.5% of the respondents said they believe that once they were familiar with using ICT, it could help them to be successful in their goals. Twenty (12.5%) said they were not sure and only three said they do not believe it can assist them. From these results, it seems that if they have an opportunity to familiarize themselves with ICT, it will not be hard for them to apply this knowledge in their professional life to support their goals. How much do you believe using ICT can help you to achieve your professional goals?
How much do you believe using ICT can help you to achieve your professional goals?

![Pie chart](image)

**Figure 4.25: How much do you believe using ICT can help you to achieve your professional goals?**

<table>
<thead>
<tr>
<th>Question 2.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much</td>
<td>48</td>
<td>30</td>
</tr>
<tr>
<td>Much</td>
<td>91</td>
<td>56.9</td>
</tr>
<tr>
<td>Not much</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Do not know</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>95.6</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 4.25: How much do you believe using ICT can help you to achieve your professional goals?**

As has already been mentioned, in many task activities, it can be seen that most respondents believe using ICT helps them to perform more easily but that it also presented barriers that they believe could hinder them achieve their professional goals.

The question here asked Thai senior educators "**How much do you believe using ICT can help you to achieve your professional goals?**" to discover their beliefs in this particular point. The results in Figure 4.25 show that most respondents believe using ICT can help them to achieve their professional goals (56.9%). The percentages of the respondents who strongly believe in the same issue were 30%. On the other hand, the
percentages of respondents who do not believe and who do not know are very low (6.3% and 2.5% respectively). The results show that the majority believe using ICT can help them achieve their goals.

If you have an opportunity to use ICT, for example, a computer, the Internet, or PowerPoint presentation programs, would you like to try these facilities?

![Pie chart showing percentages]

Figure 4.26: How if they have an opportunity to use ICT would they like to try their facilities?

<table>
<thead>
<tr>
<th>Question 2.7</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>136</td>
<td>85.0%</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>4.4%</td>
</tr>
<tr>
<td>Not sure</td>
<td>12</td>
<td>7.5%</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96.9%</td>
</tr>
<tr>
<td>Missing</td>
<td>5</td>
<td>3.1%</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4.26: How if they have an opportunity to use ICT would they like to try their facilities?

Similar to the results in part five, Thai senior educators will not hesitate to try to use ICT if they have an opportunity. In Figure 4.26, 85% of the respondents said if they had an opportunity to use ICT, a computer, the Internet, or PowerPoint presentation programs, they would try. Only 7.5% were still uncertain and 4.4% said no, which is a very low percentage compared to the majority of respondents.
Do you believe that ICT benefits current educational societies?

Figure 4.27: Do you believe that ICT benefits current educational societies?

<table>
<thead>
<tr>
<th>Question 2.8</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>154</td>
<td>96.3</td>
</tr>
<tr>
<td>Not sure</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>98.1</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>180</td>
<td>100</td>
</tr>
</tbody>
</table>

The final part in this section focused on ICT benefits for current educational societies. From the overall feedback, it can be seen that in Figure 4.27 most respondents said they believe ICT provides benefits to education (96.3%) and only 3 were not sure. No one in this particular issue said they do not believe.

4.3.3.2 Summary

Overall, the majority of Thai senior educators believed at high levels that using ICT is helpful (beneficial both for them and society). ICT is accepted by most respondents as it can help them in activities that relate to their professional goals. They also believed if they have an opportunity to use ICT, they will try it because when they become familiar with it, they believe it will help achieve their professional goals more easily.
Furthermore, to own or to have ICT facilities or devices is very important otherwise there can be a barrier to learn how to use it. In addition, being afraid/lacking confidence to use ICT or if the cost is too high and time is limited, these factors also hinder them from using ICT. On the other hand, to encourage them to use ICT, most respondents believed that if there are better learning or education facilities for ICT, or if time spent learning to use it is appropriate and the cost is cheap, they are willing to use ICT.
4.3.4 Research Question 4: "What level of ICT do they need?"

To explore the level of senior educators' needs of ICT in their academic life in this section is one of the purposes of this study. The results also are used to answer Research Question 4 "What level of ICT do they need?" The methodologies used are quantitative data analyses from Likert scale questions and qualitative data from in-depth interviews.

Answers to the Likert scale questions are classified numerically into 5. The numbers of the scale in each statement of the answers are between 5-1. These indicate accurately respondents' views (5 = strongly needed, 4 = need, 3 = uncertain, 2 = not needed, 1 = definitely not needed). The details and the results are illustrated as follows:

4.3.4.1 Data collection from questionnaires

Need to use ICT such as the computer and the Internet to support academic life

Figure 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life

<table>
<thead>
<tr>
<th>Question 4.1</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>70</td>
<td>43.8</td>
</tr>
<tr>
<td>4 need</td>
<td>59</td>
<td>36.9</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>36</td>
<td>10.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.28: The level of need of senior educators in using ICT such as the computer and the Internet to support their academic life
Figure 4.28 shows that 43% of respondents indicated strong need and 36.9% the need to use ICT such as the computer and the Internet to support their academic life respectively. These results indicate that most senior educators feel there is a need to use ICT or try to use it to support their work life especially when compared with the other results, such as uncertain 10%, not needed 38%, and definitely not needed only 0.6%.

The level of need of the benefit of using ICT to help achieve academic goals

![Figure 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals](image)

<table>
<thead>
<tr>
<th>Question 4.2</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>64</td>
<td>40.0</td>
</tr>
<tr>
<td>4 need</td>
<td>64</td>
<td>40.0</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>18</td>
<td>11.3</td>
</tr>
<tr>
<td>2 not needed</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>95.0</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.29: The level of need of senior educators of the benefit of using ICT to help them achieve their academic goals

The percentage of senior educators who reflect a strong need and who need to apply the benefit of using ICT to help them achieve their academic goals is 40% for each level. These results can be interpreted that the level of needs of senior educators of the benefits of using ICT is higher than people who do not need it. Six said do not need and no one chose definitely not needed.
Nevertheless, 11.3% are uncertain and the percentage of those who do not need in this particular issue is similar to Figure 4.28. It may be these groups of people are still unsure about the benefits of ICT or what ICT functions they can use or how can they apply it to achieve their work goals.

According to an in-depth interview, one interviewee stated that he was not sure of the benefits of using ICT and how it could help his academic work as follows:

"I have never used it because I do not have many classes. When I teach, I provide documents, paper, and worksheets for my students, and sometimes use a pen to draw the structure of chemical formulas on the overhead transparency. I am not sure if PowerPoint can do this thing or not."

Therefore, providing senior educators with details of the advantages of using ICT and how it can enable them to achieve their academic goals is an important factor that should be taken into consideration.

Desire to use ICT to help achieve professional goals

![Table 4.30: The level of senior educators' desire to use ICT to help achieve their professional goals](image)

<table>
<thead>
<tr>
<th>Question 4.3</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>68</td>
<td>42.5</td>
</tr>
<tr>
<td>4 need</td>
<td>58</td>
<td>36.3</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>17</td>
<td>10.6</td>
</tr>
<tr>
<td>2 not needed</td>
<td>7</td>
<td>4.4</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100.0</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Table 4.30: The level of senior educators' desire to use ICT to help achieve their professional goals
Figure 4.30 shows the level of senior educators' desire to use ICT in order to help them achieve their professional goals. Most respondents indicated strong need and need to use ICT to help achieve their professional goals (42.9% and 36.3% respectively). Meanwhile, 10.6% were still uncertain selecting need or do not need.

The inter-correlation matrix between;

Question 4.2: The level of need of senior educators of the benefits of using ICT to help them achieve their academic goals

Question 4.3: The level of senior educators' desire to use ICT to help achieve their professional goals

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Q 4.2</th>
<th>Q 4.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>1</td>
<td>0.851**</td>
</tr>
<tr>
<td>Q 3.2</td>
<td></td>
<td>0.851**</td>
</tr>
<tr>
<td>Q 2.7</td>
<td>0.851**</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

Table 4.30: Correlation of two variables

From the correlation coefficients shown in Table 4.30, both variables (Questions 4.2 and 4.3) have a very high positive correlation ($r = 0.851, p = .001$). This relates to the result in Figure 4.29 that whenever they are still not sure about the benefits or performance of using ICT to help in achieving academic goals, they feel a greater desire to use it.

Nevertheless, low percentages said they do not need to use ICT according to Figure 4.30. Senior educators who said they do not need it and definitely not needed, are very low (10.6% and 4.4% respectively).
The computer, one of the most powerful pieces of equipment in ICT, is very popular everywhere both at the work place or at home. However, educators who have been using it at their institutes can never use it at home because they do not possess their own computer. Figure 4.31 shows the percentage of senior educators who need a computer at home. The percentages showing strong need and need for their own computer at home are 38.8% and 33.1% respectively. Those who are uncertain totalled 15%. On the other hand, only 6.9% said they do not need a computer at home and no one said they definitely did not need one.
Need to access the Internet from home

Figure 4.32: The level of senior educators' needs to access the Internet from home

<table>
<thead>
<tr>
<th>Question 4.5</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>62</td>
<td>38.8</td>
</tr>
<tr>
<td>4 need</td>
<td>55</td>
<td>34.4</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>2 not needed</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.32: The level of senior educators' needs to access the Internet from home

The Internet plays a great role in education and lecturers, teachers and researchers use it for their academic goals, for example, searching for information to prepare lessons or do research. It is now common place in institutes and it is very convenient to use at the work place. However, Internet access from home can provide more opportunities and is convenient for people who use it at their institutes or have never used it before.

In addition, it may also be of extra importance for senior educators because some are part-time who spend a lot of time on preparation at home rather than at the institute. This question explored the level of senior educators' needs to access the Internet from home and shows in Figure 4.32 that most of them report strong need and need to access the Internet from home (38.8% and 34.4% respectively). There is a percentage, 13.8%, who are still uncertain, but only 6.9% said do not need it.

Finally, no one said they definitely do not need to access the Internet from home (0%).
Need to keep work and paper documents in hard disk or CD ROM

Figure 4.33: The level of senior educators' needs to keep their work and paper documents in their Hard disk or CD Rom

<table>
<thead>
<tr>
<th>Question 4.6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strong need</td>
<td>74</td>
<td>46.3</td>
</tr>
<tr>
<td>4 need</td>
<td>53</td>
<td>33.1</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>13</td>
<td>8.1</td>
</tr>
<tr>
<td>2 not needed</td>
<td>9</td>
<td>5.6</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.2</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.33: The level of senior educators' needs to keep their work and paper documents in their Hard disk or CD Rom

It is common practice now to store data in a hard disk or on a CD Rom. The hard disk drives at present provide huge capacities and are smaller than in the past. There are many new types available for users, for example, the USB thumb drive, or Moveable Hard disc. DVD disks are also now very popular for keeping recorded data. As the capacity of a DVD disc is much larger than a normal CD Rom, it is not surprising that most senior educators choose to keep their work and paper documents in these kinds of storage tools. Figure 4.33 shows 46.3% of senior educators voice a strong need and 33.1% needed to use these ICT tools to help them in their academic life. Only 5.6% and 0.6% do not need and definitely do not need them respectively.
Need to use email to communicate with colleagues and pupils

Figure 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

<table>
<thead>
<tr>
<th>The level of needs</th>
<th>Question 4.7 Communicate with colleagues</th>
<th>Question 4.8 Communicate with pupils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>5 strongly need</td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>4 need</td>
<td>61</td>
<td>38.1</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>30</td>
<td>18.8</td>
</tr>
<tr>
<td>2 not needed</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>93.1</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.34: A comparison of the levels of the need of senior educators to use email to communicate with their colleagues and pupils

Figure 4.34 shows the levels of Thai senior educators' needs to use email to communicate with colleagues and students. Most like to use email to communicate with colleagues, those who feel a strong need and need being 23.1% and 30.6% respectively. Regarding using email to communicate with students, 28.1% said there was a strong need and 38.1% indicated need. If the graphs of those who need to use email to communicate between colleagues and pupils is compared, the percentage of the need to contact colleagues is higher than pupils.
Need to prepare lessons by PowerPoint program

Figure 4.35: The level of senior educators' needs to prepare lessons by PowerPoint

<table>
<thead>
<tr>
<th>Question 4.9</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly need</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>4 need</td>
<td>56</td>
<td>35.0</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>24</td>
<td>15.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>93.1</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.35: The level of senior educators' needs to prepare lessons by PowerPoint

Senior educators need to use ICT software such as PowerPoint to support their academic work. Figure 4.35 shows PowerPoint is needed to prepare lessons at the same level between strong need and need (35%) because PowerPoint is very popular software that can be used to support academic goals. The results from Question 4.2 show some people still do not know the benefits of this program, 15% are, therefore, still uncertain. However, it was found only 6.3% do not need and 3 respondents indicated they definitely did not need it respectively which is a very low percentage.
Need ICT to support me to achieve academic goals

Figure 4.36: The level of senior educators' needs of ICT to support them in achieving their academic goals

<table>
<thead>
<tr>
<th>Question 4.10</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 strongly need</td>
<td>63</td>
<td>39.4</td>
</tr>
<tr>
<td>4 need</td>
<td>66</td>
<td>41.3</td>
</tr>
<tr>
<td>3 uncertain</td>
<td>16</td>
<td>10.0</td>
</tr>
<tr>
<td>2 not needed</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>1 definitely not needed</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>93.8</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.36: The level of senior educators’ needs of ICT to support them in achieving their academic goals

The last question in this section of the questionnaire asked them what level of ICT they needed to support them to achieve their academic goals. Most indicated strong need and need, 39.4% and 41.3% respectively. This means ICT is necessary to help achieve academic goals. In contrast, only 1 person definitely recorded not needed.
4.3.4.2 Summary

The results in this section answer Research Question 4 and showed that most senior educators need ICT. From the results in every question, overall senior educators' needs of ICT in their academic life are at a very high level. The percentages of senior educators who do not need and who definitely do not need ICT are very low. Some are still uncertain about need or do not need ICT because of factors such as they do not have enough information about the variety of benefits to be obtained from using ICT to help them achieve academic goals or they have no previous experience with ICT. However, these groups of people may state a need to use ICT in the future if they are provided with more information about the various kinds available.

4.3.5 Research Question 5: “How can ICT help them to be successful?”

The results in this section answer Research Question 5 “How can ICT help them to be successful [professional goals]”. In this section, there are two parts, task activities involving the use of ICT and using a computer to support senior educators’ professional goals.
4.3.5.1 Data collection from questionnaires

First, the respondents were asked how suitable the following tasks were in assisting them to achieve their professional goals. The results are shown in Figure 4.37 below.

Figure 4.37: A comparison of task activities of senior educators in supporting their professional goals
<table>
<thead>
<tr>
<th>Task</th>
<th>Very suitable</th>
<th>4</th>
<th>Suitable</th>
<th>3</th>
<th>Neutral</th>
<th>2</th>
<th>Unsuitable</th>
<th>1</th>
<th>Definitely unsuitable</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1:</td>
<td>67</td>
<td>41.9</td>
<td>52</td>
<td>32.5</td>
<td>21</td>
<td>13.1</td>
<td>4</td>
<td>2.5</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Searching</td>
<td>71</td>
<td>44.4</td>
<td>48</td>
<td>30</td>
<td>22</td>
<td>14.4</td>
<td>3</td>
<td>1.9</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>for</td>
<td>20</td>
<td>12.5</td>
<td>30</td>
<td>18.8</td>
<td>59</td>
<td>36.9</td>
<td>23</td>
<td>14.4</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>information</td>
<td>38</td>
<td>23.8</td>
<td>47</td>
<td>29.4</td>
<td>45</td>
<td>28.1</td>
<td>13</td>
<td>8.1</td>
<td>5</td>
<td>3.1</td>
</tr>
<tr>
<td>Task 3:</td>
<td>56</td>
<td>35</td>
<td>46</td>
<td>28.8</td>
<td>27</td>
<td>16.9</td>
<td>13</td>
<td>8.1</td>
<td>6</td>
<td>3.8</td>
</tr>
<tr>
<td>Creating a</td>
<td>31</td>
<td>19.4</td>
<td>56</td>
<td>35</td>
<td>41</td>
<td>25.6</td>
<td>7</td>
<td>4.4</td>
<td>12</td>
<td>7.5</td>
</tr>
<tr>
<td>webpage</td>
<td>54</td>
<td>33.8</td>
<td>62</td>
<td>38.8</td>
<td>22</td>
<td>13.8</td>
<td>7</td>
<td>4.4</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Task 4:</td>
<td>76</td>
<td>47.5</td>
<td>54</td>
<td>33.8</td>
<td>14</td>
<td>8.8</td>
<td>3</td>
<td>1.9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Making</td>
<td>17</td>
<td>10.6</td>
<td>35</td>
<td>21.9</td>
<td>62</td>
<td>39.4</td>
<td>19</td>
<td>11.9</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>educational</td>
<td>9</td>
<td>5.6</td>
<td>19</td>
<td>11.9</td>
<td>52</td>
<td>32.5</td>
<td>37</td>
<td>21.1</td>
<td>30</td>
<td>18.8</td>
</tr>
<tr>
<td>arrangements</td>
<td>21</td>
<td>13.1</td>
<td>37</td>
<td>23.1</td>
<td>48</td>
<td>30</td>
<td>26</td>
<td>14</td>
<td>8.8</td>
<td>14</td>
</tr>
<tr>
<td>Task 6:</td>
<td>20</td>
<td>12.5</td>
<td>42</td>
<td>26.3</td>
<td>41</td>
<td>28.6</td>
<td>27</td>
<td>16.9</td>
<td>17</td>
<td>10.6</td>
</tr>
<tr>
<td>Task 7:</td>
<td>17</td>
<td>10.6</td>
<td>50</td>
<td>31.3</td>
<td>40</td>
<td>25</td>
<td>20</td>
<td>12.5</td>
<td>19</td>
<td>11.9</td>
</tr>
</tbody>
</table>

Table 4.37: A comparison of task activities of senior educators in supporting their professional goals
From the results in Table 4.37, it can be seen that 4 activities (Tasks 1, 2, 5, and 8) with high percentages that respondents consider are very suitable to support them in their professional goals.

Task 1 is searching for information on websites. Table 4.37 shows 41.9% of the senior educators consider searching websites a very suitable activity. Whilst, 32.5% of respondents think it suitable. This indicates that Thai senior educators believe this task can support them to attain in their professional goals.

Task 2 is using a search engine to seek information. A search engine is a tool that can help senior educators in their professional goals. Table 4.37 shows 44.4% of respondents think using it to seek information is a very suitable ICT activity. Another group, 30% think this task is suitable. The percentage of respondents who are uncertain considering it as neither suitable nor unsuitable is 14.4%. However, the overview of the feedback in this section is that the majority of participants (74.4%) believed using a search engine to seek information is a very suitable task activity for senior educators searching information on the World Wide Web and that this task can help support their goals.

Using email, senior educators can easily communicate with other persons for instance, pupils, colleagues, and administrators. In Task 5 which is checking e-mail, there are strong positive results in answer to the research question that using email is an activity that can help senior educators achieve their goals. Most senior educators chose checking email as either a very suitable task (35%) or a suitable task (28.8%) for them to be successful in their goals.

Senior educators think that Task 8, regarding needing more direction on using ICT to search for information, is suitable. Figure 4.44 shows the overview of respondents who consider this particular task is either very suitable or suitable (47.5% and 33.8% respectively). The percentage of respondents who think this particular task is unsuitable is 1.9%.

The results for these particular task activities show only a few respondents think Task 1, 2, 5 and 8 are definitely unsuitable with 2, 1, 6 and zero respectively.

Tasks 4, 6, 7, 12 and 13 are activities considered suitable for their professional goals. The results show a high percentage of respondents think Task 4: transferring a
photo or data to others by using ICT is suitable (29.4%). Task 6: Checking time schedules revealed 39% of respondents support this item. In addition, Task 7: Making educational arrangements, Task 12: Using VDO streaming, Watching movies or news, and Task 13: Discussing or chatting with other persons, are also suitable task activities according to the high percentages of these particular activities (38.8%, 26.8% and 31.3% respectively). Even though, the percentages of respondents who chose “very suitable” in these particular tasks are less than “suitable”, but in combining the very suitable and suitable scores, the overview of suitability of these tasks is suitable. As a result, Tasks 4, 6, 7, 12, and 13 are suitable activities for senior educators.

A high percentage of respondents think some tasks may be neutral for supporting their professional goals, for example Task 3: creating a webpage (36.9%), Task 9: Posting messages on the web board (39.4%), Task 10: Buying something via e-commerce (32.5%) Task 11: and Registering information (30%).

Regarding the results in this part, there is no task activity that the majority of respondents think is unsuitable and definitely unsuitable, but there is interesting data from Task 10: buying something via e-commerce because 23.1% and 18.8% of respondents think this task activity is unsuitable and definitely unsuitable. This will be discussed in the next chapter. The missing data in this section which involves respondents who did not select any answers, usually lower than 10%, will be discussed in the next chapter.
The second part asked senior educators how suitable it is for them to use a computer for professional tasks (Tasks 1-12) to support their goals. The results are as follows:

Figure 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals
Table 4.38: A comparison of task activities of senior educators in using a computer to support their professional goals

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>5 Very Suitable</th>
<th>N</th>
<th>%</th>
<th>4 Suitable</th>
<th>N</th>
<th>%</th>
<th>3 Neutral</th>
<th>N</th>
<th>%</th>
<th>2 Unsuitable</th>
<th>N</th>
<th>%</th>
<th>1 Defining unsuitable</th>
<th>N</th>
<th>%</th>
<th>Missing</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>Keep records such as grades and attendance</td>
<td>39</td>
<td>24.4</td>
<td>56</td>
<td>35</td>
<td>31</td>
<td>19.4</td>
<td>7</td>
<td>4.4</td>
<td>10</td>
<td>6.3</td>
<td>17</td>
<td>10.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 2</td>
<td>Word processing of test, handouts, other materials</td>
<td>60</td>
<td>37.5</td>
<td>53</td>
<td>33.1</td>
<td>20</td>
<td>12.5</td>
<td>6</td>
<td>3.8</td>
<td>5</td>
<td>3.1</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 3</td>
<td>Prepare lesson plans</td>
<td>56</td>
<td>35</td>
<td>66</td>
<td>41.3</td>
<td>13</td>
<td>8.1</td>
<td>6</td>
<td>3.8</td>
<td>4</td>
<td>2.5</td>
<td>15</td>
<td>9.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 4</td>
<td>Presentations</td>
<td>62</td>
<td>38.8</td>
<td>56</td>
<td>35</td>
<td>16</td>
<td>10</td>
<td>6</td>
<td>3.8</td>
<td>3</td>
<td>1.9</td>
<td>17</td>
<td>10.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 5</td>
<td>Facilitate project-based learning</td>
<td>50</td>
<td>31.3</td>
<td>54</td>
<td>33.8</td>
<td>32</td>
<td>20</td>
<td>4</td>
<td>2.5</td>
<td>3</td>
<td>1.9</td>
<td>17</td>
<td>10.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 6</td>
<td>Communicate with students and parents</td>
<td>27</td>
<td>16.9</td>
<td>39</td>
<td>24.4</td>
<td>53</td>
<td>33.1</td>
<td>16</td>
<td>10</td>
<td>9</td>
<td>5.6</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 7</td>
<td>Communicate with your colleagues</td>
<td>26</td>
<td>12.5</td>
<td>59</td>
<td>36.9</td>
<td>30</td>
<td>18.8</td>
<td>13</td>
<td>8.1</td>
<td>8</td>
<td>5</td>
<td>14</td>
<td>8.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 8</td>
<td>Communicate with administrators</td>
<td>24</td>
<td>15</td>
<td>44</td>
<td>27.5</td>
<td>50</td>
<td>31.3</td>
<td>13</td>
<td>8.1</td>
<td>13</td>
<td>8.1</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 9</td>
<td>Participate in online professional development</td>
<td>34</td>
<td>21.3</td>
<td>55</td>
<td>34.4</td>
<td>43</td>
<td>26.9</td>
<td>5</td>
<td>3.1</td>
<td>7</td>
<td>4.4</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 10</td>
<td>Search information for your students</td>
<td>51</td>
<td>31.9</td>
<td>64</td>
<td>40</td>
<td>20</td>
<td>12.5</td>
<td>7</td>
<td>4.4</td>
<td>3</td>
<td>1.9</td>
<td>15</td>
<td>9.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 11</td>
<td>Conduct student assessments</td>
<td>30</td>
<td>18.8</td>
<td>58</td>
<td>36.5</td>
<td>40</td>
<td>25</td>
<td>9</td>
<td>5.6</td>
<td>7</td>
<td>4.4</td>
<td>16</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task 12</td>
<td>Seek professional advice and counseling</td>
<td>24</td>
<td>15</td>
<td>47</td>
<td>29.4</td>
<td>43</td>
<td>26.9</td>
<td>19</td>
<td>11.9</td>
<td>12</td>
<td>7.5</td>
<td>15</td>
<td>9.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the results in Table 4.38, using a computer in Tasks 2 and 4 is considered a very suitable activity for Thai senior educators as indicated by the high percentages. The results are interpreted as follows.

For Task 2, the word processing of tests, handouts and other materials, the respondents think it very suitable to use a computer to perform these jobs. In this particular group, 37.5% believed it to be very suitable and a further, 33.1% agreed that it is suitable. On the other hand, there are low percentages for respondents who think it is unsuitable and definitely unsuitable (3.8% and 3.1% respectively).

Task 4 concerns presenting lessons by using a computer. The results show most respondents agreed that using a computer is very suitable in presenting lessons, 38.8%. 35% also think the activity is suitable. Very low percentages of respondents think it is unsuitable and definitely unsuitable 3.8% and 19% respectively. The percentages of respondents who are still uncertain about this particular task is also low, at 10%.

Although the highest agreement about suitability was given to Tasks 2 and 4, strong percentages from respondents in Tasks 1, 3, 5, 7, 9, 10, 11, and 12 also revealed that these tasks are "suitable" to support their goals as well.

Task 1 asked respondents how suitable it was for them to use a computer for keeping records or storing information and the results show they believe it is suitable. Figure 4.50 shows 39% and 24% of the respondents agree using a computer to do this task is very suitable and suitable respectively. In contrast, the percentages of respondents who think it is unsuitable and definitely unsuitable are low (4.4% and 6.3% respectively).

For Task 3, preparing lesson plans, the results show senior educators agree that using a computer is a suitable activity that can help achieve their goals. Figure 4.52 shows the majority of respondents feel that using a computer to do this task is suitable (41.3%). In addition, 35% think a computer is a very suitable for this particular as well. Only 6 and 4 participants think it is unsuitable and definitely unsuitable respectively.

Task 5 indicated opinions about using a computer to facilitate a project-based learning activity. The results show 33.8% of senior educators agreed that it is suitable to use a computer to support project-based learning and 31.3% think it very suitable. Both percentages of suitable and very suitable scores are high, on the other hand, the percentages of the respondents who have contrasting views on this topic are very
low, 2.5% unsuitable and 1.9% definitely unsuitable. Therefore, it can be said that the use of a computer to facilitate a project-based learning activity is a suitable activity to support Thai senior educators' professional goals.

Task 7 concerns communicating with colleagues. It seems senior educators are likely to use a computer for the results in Figure 4.56 show that 59.4% believe it enhances communication between colleagues, (22.5% very suitable, 36.9% suitable). In addition, the percentage of senior educators who think it is unsuitable and definitely unsuitable are very low (8.1% and 5% respectively). According to the high percentages of very suitable and suitable scores, it can be interpreted that this activity is suitable for them as well.

Task 9 shows most respondents think using a computer for participation in online professional development is a suitable activity (34.4%) and the percentages of the respondents who think this task is very suitable is 23.1%. Only 3.1% think it unsuitable and 4.4% think it definitely unsuitable. Some respondents, 26.9%, are not sure if this activity will be suitable or unsuitable. However, the general overview of respondents is they think particular task is suitable.

Task 10 asks about using a computer to search for information for students. It is common today to see lecturers using a computer to search for information for their pupils. Senior educators think this particular activity is either suitable or very suitable for them (40% and 31.9% respectively). Only 3 people thought it definitely unsuitable.

With reference to using a computer to assess a student's studies, respondents thought it suitable. Task 11 shows the majority of senior educators feel that a computer is suitable for conducting student assessments (36.3%), 18.8% think this task is very suitable but some respondents are still uncertain about this particular issue whether suitable or unsuitable (25%). However, in comparing the percentages between suitable and unsuitable, it can be seen that most respondents still believe that this activity is suitable to support their goals.

Task 12 refers to using a computer to seek peer-to-peer advice and for counselling. Table 1.38 shows most respondents think it is suitable to use a computer for seeking peer-to-peer advice and for counselling (29.4%) and some think it is very suitable (1.9%). However, this particular percentage is not very different to the
percentages of neither suitable nor unsuitable (26.9%). The results from this section seem suitable but not very suitable.

Nevertheless, the percentages of respondents who think using a computer may neither be suitable nor unsuitable are very high in Tasks 6 and 8 which included using a computer to communicate with students and parents of the student, and using a computer to communicate with administrators, 33.1% and 31.3% respectively. The percentages of respondents who think it is unsuitable and definitely unsuitable for all tasks are presented in Table 4.38 (Tasks 1 - 12). These results will be discussed in the next chapter.

4.3.5.2 Summary

The results in this section showed ICT can help Thai senior educators in many suitable tasks and activities to accomplish their professional goals. The particular activities that most respondents think are very suitable are searching for information on websites, using a search engine to seek information, and needing more direction. In addition, using a computer can help them in their many professional tasks too. To use one to support their activities, most respondents agreed using Word processing to manage and organize tests, handouts, prepare materials and using Presentations in lessons are very suitable, while most respondents think they are only suitable, neither nor unsuitable, or unsuitable, and definitely unsuitable.
4.3.6 Research Question 6: "What appropriate ICT do they need to succeed?"

Because of the rapid development of ICT today, there are many devices and software applications that are assisting educators in their academic activities. Each type of ICT has various benefits and functions in support of their goals. However, for some senior educators not familiar with the new technology, not every type will be suitable because they think some may be difficult to use and may be they do not often have much chance to use them. Therefore, considering what ICT to use, how often to use it and how much they believe a particular ICT can assist in the accomplishment of their professional goals, is important. These factors will help them understand what ICT may be suitable for them.

This section presents correlations between what ICT senior educators use very often and how much they believe it will help them to achieve their goals in order to answer the Research Question 6 “What appropriate ICT do they need to succeed”. The appropriate ICT in these areas has been classified into, first the ICT devices and second software tools.
4.3.6.1 Data correlation

Pearson Correlation  
Slg. (2-tailed)  
N=160

Frequency of use of ICT devices

<table>
<thead>
<tr>
<th>Thai senior educators' beliefs in how a particular ICT can assist in the accomplishment of their professional goals (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A desktop computer</td>
</tr>
<tr>
<td>A laptop computer</td>
</tr>
<tr>
<td>A cell phone</td>
</tr>
<tr>
<td>APDA (Personal Digital Assistant)</td>
</tr>
<tr>
<td>A scanner</td>
</tr>
<tr>
<td>A printer</td>
</tr>
<tr>
<td>A projector</td>
</tr>
<tr>
<td>A digital camera</td>
</tr>
<tr>
<td>A CD burner</td>
</tr>
<tr>
<td>A TV, VCD or DVD Player</td>
</tr>
<tr>
<td>A web camera</td>
</tr>
</tbody>
</table>

Frequency of use of Software tools

<table>
<thead>
<tr>
<th>Thai senior educators' beliefs in how a particular ICT can assist in the accomplishment of their professional goals (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAI (Computer Aided Instruction)</td>
</tr>
<tr>
<td>Spreadsheets</td>
</tr>
<tr>
<td>Word processor</td>
</tr>
<tr>
<td>Software presentation</td>
</tr>
<tr>
<td>Graphics and multimedia</td>
</tr>
<tr>
<td>World Wide Web browsers</td>
</tr>
<tr>
<td>Calculation programs</td>
</tr>
<tr>
<td>Search engines</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 (p) level (2-tailed).
** Correlation is significant at the 0.01 (p) level (2-tailed).
*** Correlation is significant at the 0.001 (p) level (2-tailed).

Table 4.39: Correlation matrix of Thai senior educators’ beliefs in how a particular type of ICT can assist in the accomplishment of their professional goals and how much they use ICT

The results in Table 4.39 show the correlation matrix between Thai senior educators in this study who believe ICT can assist them to achieve their professional goals and how often they use it. In this particular table, ICT is divided into two parts: ICT devices and Software tools.

ICT devices

From the correlation coefficients shown in Table 4.39, the ICT devices that have strong correlations between Thai senior educators’ use of particular ICT and their belief that this particular item can assist in the accomplishment of their professional goals are a cell phone (r = .489, p = .001), a printer (r = .346, p = .001), a desktop computer (r = .330, p = .001), and a scanner (r = .303, p = .001) respectively. These results indicate
that Thai senior educators believe these particular devices that they use very often can help to achieve their professional goals at a high level.

In addition, it can be seen that other devices, where there is a correlation in this particular issue at medium level, are a digital camera \( (r = .268, p = .01) \) and a TV, VCD or DVD player \( (r = .277, p = .01) \). On the other hand, Laptops, Projectors, CD burners, and Web cameras have a very low correlation \( (p = .05) \). The ICT device that has no correlation is PDA \( (r = 133) \).

Software tools

The strongest correlation between software tools often used by Thai senior educators and their beliefs that these particular tools can assist in the accomplishment of their professional goals are a Word processor \( (r = .345, p = .001) \), Software presentation \( (r = .337, p = .001) \) and Spreadsheets \( (r = .318, p = .001) \) respectively.

CAI, Search engines, and Graphics and multimedia programs show correlations at a medium level \( (r = .289, p = .01), (r = .286, p = .01), \) and \( (r = .270, p = .01) \) respectively. Low correlation coefficients for software tools are Calculations programs \( (r = .193, p = .01) \) and World Wide Web browsers \( (r = .174, p = .01) \).

4.3.6.1 Summary

In summary, from the strong correlations of ICT often used by Thai senior educators and their beliefs that these particular tools can assist in the accomplishment of their professional goals, it can be concluded that a cell phone is the most appropriate ICT device, being used widely not only in Thailand but everywhere in today's societies. In addition, a printer, a desktop computer, and a scanner also are considered suitable devices. The most suitable software tools appropriate for Thai senior educators are a word processor, software presentations and spreadsheets respectively. On the other hand, Table 4.39 shows, some ICT devices and software tools that are not considered to be suitable for them are a PDA or calculation programs.

Finally, it can be interpreted that familiarity with ICT tools increases the chances of their being considered useful for goal achievement. This means whenever Thai senior educators have become familiar with or have been using ICT tools themselves, they realize the benefits and apply these tools in supporting their professional goals over those who have never used ICT.
The second major questions

4.3.7 Research Question 7:

"What do they [Thai senior educators] believe will be the best way for them to learn ICT?"

The choice of a suitable method for senior educators to learn how to use ICT is very important. Which method would be the best for them is the aim of this research question and they were asked, "What do you believe will be the best way for you to learn ICT?" The answers to this particular question are listed below.

4.3.7.1 The best method for Thai senior educators to learn how to use ICT

To obtain quantitative data, 160 respondents were asked in the questionnaire which of the five scenarios best describes methods they could use to learn how to use appropriate ICT and why they chose this method.

Scenario 1 Workshop by a lecturer in front of the class
Scenario 2 Workshop by peer to peer training in groups with one peer and one trainer in each group
Scenario 3 Workshop in small group training with one mentor in each group
Scenario 4 Self learning by using E-learning or with CAI
Scenario 5 Learning from an instructional book
From the above methods, respondents selected the one that they believe it would be the best way for them to learn ICT and the details of which are shown in Figure 4.62.

![Figure 4.39](image)

**Figure 4.39:** The percentages of scenario methods that were selected by the respondents

<table>
<thead>
<tr>
<th>Question 6</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1 Workshop with lecturer</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Scenario 2 Workshop by peer to peer training in groups with one peer and one trainer in each group</td>
<td>45</td>
<td>28.1</td>
</tr>
<tr>
<td>Scenario 3 Workshop in small group training with one mentor in each group</td>
<td>38</td>
<td>36.3</td>
</tr>
<tr>
<td>Scenario 4 Self learning by using E-learning or with CAI</td>
<td>21</td>
<td>13.1</td>
</tr>
<tr>
<td>Scenario 5 Learning from an instructional book</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>89.4</td>
</tr>
<tr>
<td>Missing</td>
<td>17</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.39: The percentages of scenario methods that were selected by the respondents
Figure 4.39b shows that, Scenario 3, the workshop in small group training with one mentor in each group (36.3%) was the most popular choice. The reasons they believed this particular method would be best are as follows:

1. It is small group training therefore people can be selected in each group depending on the difficulty of the lessons or the level of learners in the groups.

2. They feel this particular method is not boring because they have friends with whom they can confer not only the lecturer or the tutor.

3. This method is cheaper than Scenario 2

4. Members in small groups can exchange ideas, knowledge, and analyse problems between themselves in a short time because the number of people in each is small.

5. Learning in small groups enables them to feel less shy and nervous.

6. The tutors can monitor learners easily.

Respondents who chose Scenario 2, the workshop by peer to peer training in groups with one peer and one trainer in each group accounted for 28.1% because they believed:

1. They have a "buddy" of the same age learning together and they can also discuss or share ideas with their friends in case of doubt.

2. There is more opportunity to practise than learning in a big class.

3. The tutor and learners are closer than in a big workshop.

4. Some expressed that belief that this method would be better than the methods they had tried before.
The percentages of respondents who chose Scenario 4, Self-learning by using E-learning or with CAI, and Scenario 5, Learning from an instructional book, are 13.1% and 9.4% respectively.

Senior educators who selected 4 expressed their views as follows:

1. They can manage and organize their time to learn ICT, meaning they can learn whenever they wish.
2. It is a convenient method and saves travelling time.
3. No matter the skills and speed of learners by using this method they can learn by themselves so do not need to worry about any inability to follow other people or that they will disturb other learners.
4. They think this method is better than Method 5 but do not say why.

The percentage of respondents who selected Scenario 5 is slightly lower than Scenario 4. Participants stated that:

1. This method is very familiar and it is the basic method in learning for everyone.
2. People can learn anytime they are free and it is convenient in everyday life.
3. It is a learning method for people who want to have basic knowledge before going to the workshop class.

The least popular scenario was a workshop by a lecturer in front of the class (4 respondents, 2.5%). They made the following comments:

1. This is intensive course learning because the number of learners is greater than in the other methods as they are learning together at the same time.
2. Everyone can ask the lecturer.
3. Learners have to concentrate a great deal to understand clearly.
The supplemental question asked "What other methods would you like to use to learn about ICT?" The respondents' comments have been summarized as follows:

1. They suggested that some time people like to learn by asking directly from the experts in ICT.
2. They sometimes ask their children at home.
3. They can learn by themselves from public media such as the TV or the Newspaper.
4. If it is computer software, they can try to learn from help functions in each program.
5. They would like to have an individual tutor.
6. They may choose the long distance learning method using satellite technology.

Moreover, respondents gave additional suggestions about this particular issue stating:

1. There should be a club for senior people who can exchange knowledge and information and communication technology.
2. Instruction should be continuous and there should an evaluation of the results other the training finishes.
3. There should be demonstrations of the new ICT programs or ICT hardware via the public media and to allow senior educators to try it too.
4. The textbook should be brief and easy to understand.

4.3.7.2 In-depth Interviews

In-depth interviews were conducted to obtain a greater depth of information to explore respondents' answers to this particular issue. They used semi-structured forms where the questions were flexible according to reactions, and conscious reasons for actions or feelings from the interviewees. This allows the researcher to receive a great deal of extra useful information to cover the aim of the research question.
Interviewees were asked about several points that related to the particular issue: "What do you believe will be the best way for you to learn ICT". The information was classified under 4 headings:

1. Learning ICT
2. Difficulties in learning ICT
3. Appropriate ways to learn ICT
4. Other suggestions

4.3.7.3 Learning ICT

There were varied opinions on how interviewees learned to use ICT.

For example, one senior female (Interviewee A), responded to questions related to training as below:

- At first how did you learn to use ICT?
  "At my university I had training courses but I still do not have good skills".

- What kind of training course did you attend?
  "Workshop training"

- How many people were there in the class?
  "It was quite a large workshop There was one expert in front of the class and other mentors helped".
• It seems you are familiar with ICT. May I ask, how you learnt it?

"I attended training courses at my university. The technology just came when we were getting old and about to retire. If we still have to work, why do not learn how to use it? We have to concentrate. I think 90% of the staff in my university need to know how to use it".

(Interviewee B, a female senior university lecturer)

• How are people trained?

"Sometimes they invite other lecturers from outside even though we already have our own computer lecturers. There are about 30-40 persons in one class but numerous mentors to help us. The training courses have many levels, beginning from the basic level which has lots of students who have no skills or cannot operate the computer in the class to advanced levels where the classes are smaller. In the beginning classes may be large".

(Interviewee B, a female senior university lecturer)

• Normally, older people of a similar age as you, are not much interested in technology but you are different. Did you learn it by yourself or did you learn from somewhere?

"I was trained. I also like to seek new information and knowledge from the Internet rather than go to a library".

(Interviewee C, a male Assistant professor)

• Where did you learn to use ICT?

"Actually, there were courses but my free time did not allow me to attend very much. I was trained once or twice but some I didn’t use. For example, I learnt Excel but I didn’t use it. PowerPoint I have used a little bit. The courses were short about half a day for 2-3 days. After that I learned by myself: I have text books but never use them. I learn by trial and error. Even though I want to learn, I could not follow them because there was only one lecturer in the class and it was inconvenient to ask. If I ask friends in class, it may not be a good thing because it will disturb their time. Therefore, it seems I did not really learn. Excel I cannot use but PowerPoint I know a little".

(Interviewee D, a female Assistant professor)

• What kind of training course did you attend?
"It was a large group about 30 people and we had to learn at the same time. The lecturer taught and used PowerPoint but I did not have the basic skills".

(Interviewee D, a female Assistant professor)

- Was there any mentor?

"There was one mentor".

(Interviewee D, a female Assistant professor)

- That means you mainly learned by yourself and you asked when you had a problem.

"I ask someone to tell me the steps and then I practise at that time. I am not like young people who can learn in the normal way very quickly".

(Interviewee E, a male Assistant professor)

- Have you have used PowerPoint since before retiring and after retiring?

"Yes, I can use it tolerably well. Usually, when I begin learning, I will take some short notes how to do it step by step. After that I will practise by myself. I sometimes search for interesting information from the Internet, then I will record it. This information is so useful for my teaching. Another important thing is I have to use or practise it everyday. Fortunately, when I was about to retire, there was a computer on my table at my office. I wanted to try it but I didn't know how to turn it on, so I just asked other people how to turn on and off. After that, I have practised regularly and took short notes. After that, I learnt how to use functions. Now I can use it and I also use email to contact my colleagues. It is so useful for me".

(Interviewee E, a male Assistant professor)

From the respondents' answers, it can be seen that the common ways senior educators learnt were training courses with a lecturer in front of the class or tutors around the workshops. Workshops usually dealt with a large number of learners. The other ways they used to learn were learning by themselves and asking other people.
4.3.7.4 Difficulties in learning ICT

The interviews revealed that many experienced difficulties in learning how to use ICT. First, they suffered problems about the facilities available to learn and to practise. Second, the ICT basic skills of each person are still not good. Third, they also suffered because the number of people in each workshop was too high. The details of the results (questions and answers) in this particular issue are given below.

- What difficulties do you experience when you use ICT?

"The problems are, first, the hardware is not updated. The updated one is too expensive for us. The capacity of the computer is not good enough, the software licenses are not cheap, and maintenance costs are high. Secondly, the problems belong to users for they have different skill levels".

(Interviewee F, a male senior university lecturer)

- As you are familiar with ICT, do you have any problems or what difficulties do you experience when you use ICT?

"Mainly, I learn by myself. It was learning by trial and error. Sometimes I learn from textbooks or instructional books and by asking experts. I am not expert in these things just medium level. I am a user, I am working in the education fields and am not good at IT so the problem is my computer skills are not good so they hinder my work."

(Interviewee C, a male Assistant professor)

- To use ICT, there should be supporting facilities, shouldn't there? Where do you use these things?

"There are many things. For example, I have a Login name from my university to connect to the Internet".

(Interviewee C, a male Assistant professor)

- Is there any training in ICT at your university?

"Yes, but it was very hard to learn because it was conducted in a big group."

(Interviewee E, a male Assistant professor)
4.3.7.5 Appropriate ways to learn ICT

There were many ways interviewees thought might be suitable to learn ICT. Learning with people of the same age group in friendly environments which included entertainment, a club or a society, was a way that more than one interviewee mentioned. If it is necessary to provide a workshop, there should not be too many members in the class. CAI is useful to help people learning about ICT, however, the computer skills of learners should be considered and also its contents should be attractive. Learning by asking experts and taking notes in order to practise was another method considered successful. In addition, interviewees also stressed that it is important to consider the level of the learners. They also believed that to use only one method may not be enough because each method has different advantages and disadvantages. Using multiple methods should, therefore, be appropriate for this group of people. The information (questions and answers) gives details of what they said regarding this particular issue:

- For senior people who want to learn ICT which method do you think is suitable?

  "There is a club for older persons in Thailand which has been set up to train them to use computers and the Internet. Some older people have learnt ICT and now they have many friends on the Internet and they can also teach other older people to use ICT. So it depends on a person's interests. If we also think we are silly and slow, we will never be familiar with it. If we do not think like that, we may be able to learn. We have to practise many times and if there is any problem, we have to ask an expert".

  (Interviewee B, a female senior university lecturer)

- What do you think if researchers or course developers investigate ICT training aids or training course to assist senior educators make them familiar with the use of ICT?

  "Very good, I strongly agree with this because many senior educators who are already retired or are not yet retired, still work or still have academic goals and have no chance to use this particular technology. For me I think it is very important for people who still want to be in academic fields".

  (Interviewee A, a female former university Vice-president)
- So far, have you ever provided workshop training?

"Yes"

(Interviewee F, a male senior university lecturer)

- How was it? Was it a workshop by a lecturer in front of the class or for a small group of people with one tutor in each group, or anything else?

"Normally, we set up a workshop with around 25-30 people with one lecturer and 1-2 mentors."

(Interviewee F, a male senior university lecturer)

- What about learning from CAI?

"I think it is a good idea but it may be slow. We have to understand the learners’ skills. If they do not have any, we must balance them. I remember the first time I was trained in PowerPoint. Some lecturers taught based on their understanding. They did not give the reasons why they did this. I could not remember. If they had explained, it would have been very helpful, not only for senior educators who had never used ICT, but also for the younger people. It is pity."

(Interviewee B, a female senior university lecturer)

- Have you ever provided CAI for them? Is it possible to use CAI to do this?

"It is hard because of several factors. For example, some people don’t know how to operate the computer. If we provide them with CAI, it will be very difficult for them."

(Interviewee F, a male senior university lecturer)

- What about training courses for older people? Should they be in a big class or in a small group?

"It does not matter, a small or big group, but the thing is, we must balance the skills of the learners. Second, if we do not balance their skills, we have to pre-test them and then put them into the right level. Finally, it is necessary to
provide the correct number of tutors or TA's may be 3-10 people a class or sometimes 1 tutor per student'.

(Interviewee B, a female senior university lecturer)

- If we have to encourage senior people to use ICT, in your opinion, how can it be done or what suitable methods do you believe are best for this group of people to learn ICT and receive its benefits?

"I would like to give an example. Nowadays, adult education, lifelong learning, or education related to older people have been already put into the government policies (1999-2002). Therefore, if we practice regularly, we will not forget it. However, for senior people to encourage them to use ICT, the education should be taken into consideration. That means to encourage them we will have to include two things: 1 knowledge, 2 entertainment".

(Interviewee C, a male Assistant professor)

- In your opinion, which method do you believe is the best for you to learn ICT? Why do you choose this method?

"I think workshop training would be good because we can do it by ourselves at that time. To learn from instructional books or CAI alone may be very slow especially for older people. There is a group of people to teach older people how to use computers and the Internet. The members of this group are all older people. They not only provide the knowledge but they have activities to entertain older people. They will help older to overcome the fear of the computer and make them not feel lonely. Older people who have been trained by this group can talk about IT with their children at home and will not feel out of date".

(Interviewee A, a female former university vice president)

- That means there are regular activities and they must be special for older people. Are they different from normal training?

"Yes and the participants are of the same age".

(Interviewee A, a female former university vice president)
And they still need to use ICT too.

"Yes, because some people have to contact people in other countries".

(Interviewee A, a female former university vice president)

Today which ICT resources have you used?

"Normally, I ask my staff to do for me, I am a user".

(Interviewee A, a female former university vice president)

If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?

"I think it would be useful. Actually, I have many books both in English and in Thai but they are not attractive to learners. It would be good if they were more attractive".

(Interviewee D, a female Assistant professor)

Could you follow them [a big group workshop]?

"I could but it did not understand very clearly. After that I needed to learn using the method I told you about. I can go faster than my friends of the same age group and learn in the normal way I practise and when I have questions, I ask. For senior people, I think this method is quite successful and it is better than to learn from the beginning. Because we are old, we need to learn by short cuts. This is my understanding because I have tried myself and was successful".

(Interviewee E, a male Assistant professor)

Do you think it is good to use CAI to help senior educators use ICT?

"CAI actually is needed. Learning from CAI is not old fashioned. It is especially useful for older people who live far away from the city and find it inconvenient to travel. Therefore CAI is still important in my view".

(Interviewee G, a female senior university lecturer)
- If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?

"I strongly agree with this, especially for senior educators because we find that these groups of people still need to learn by themselves and it is sometimes not convenient to travel".

(Interviewee G, a female senior university lecturer)

- Between CAI and organizing a workshop or course in small groups, which would be suitable for senior educators?

"I will not choose to learn only one method because learning in a group with other people such as younger people will cause the class to run slowly. As I am a bit slow, learning by oneself with instructional books is good because I can learn without any time limit and do not disturb other people. However, older people normally stay alone so to learn in a group, older people will have friends and not feel lonely because they can talk with other senior people. Therefore, I will choose the middle way, e.g. using multi methods".

(Interviewee D, a female Assistant professor)

4.3.7.6 Other suggestions

In the interviews, interviewees were given a chance to talk or add other suggestions about this question and details of their comments are as follows:

- Finally, do you have any suggestions for the researcher in this particular issue?

"Remember senior educators will use ICT whenever

1 They feel it is convenient
2 They have time
3 When they have an advisor.

(Interviewee H, a male Assistant professor)

- If there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think it is a good idea?

"In my opinion, we have to look at the goals, what they want to learn ICT for. Whenever learners have goals and know what to learn, it will be a success if
not, they may be interested only at the beginning but after that they will become bored and not understand and not want to learn any more. If we train people who are really interested, they will be likely to learn and become familiar with ICT. To sum up, the goals of the learners are important.

(Interviewee F, a male senior university lecturer)

Finally, do you have any suggestions for the researcher in this particular issue?

"We have to focus on the skills of the learners and their goals to use ICT. We still have to train them then let them learn from the CAI alone. Sometimes we give them the CAI but they never turn it on because they don't understand or have no time, so it is useless. Therefore, the thing we have to do is to make them understand how to use it and the exact significance of using ICT. If we train them, we must know how to encourage them to use it."

(Interviewee F, a male senior university lecturer)

So self-learning is still difficult for them, is it?

"In self-learning, learners must have goals first. If we just give them CAI, they may not be interested. Like a student, the teacher must detail the objectives of learning for them and then students will study."

(Interviewee F, a male senior university lecturer)

Finally, if there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think this is a good idea?

"We must understand that the nature of older people is they may be slow. They know ICT is important but they are still slow."

(Interviewee A, a female former university vice president)

Finally, do you have any suggestions for the researcher in this particular issue?

"The researcher should consider that learners have many levels so the tools or teaching aids or training courses should be based on the level of the learners."

(Interviewee G, a female senior university lecturer)
“Today, technology has many facets, but how can we merge them and encourage people at every age to realise the benefits? This is an important point. The Government should have a policy to encourage people to learn about ICT otherwise we cannot compete with other countries.”

(Interviewee C, a male Assistant professor)

“I am sure, it is useful”.

(Interviewee D, a female Assistant professor)

Are you still interested in ICT?

“Yes, I am and I think other senior people will think the same as me. Don’t forget to make it attractive with sound and movies far then it would be good”.

(Interviewee D, a female Assistant professor)

If there is a researcher who would like to develop teaching aids for senior educators to learn ICT, do you have any suggestion?

“It depends on personal interest. We have to study how necessary ICT is for them. The study does not need to focus on only senior educators, however it can be any older person. Another thing is we have to provide facilities for them such as user name and passwords to logon the Internet”.

(Interviewee C, a male Assistant professor)

Finally, if there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think it is a good idea?

“As I told you, there are many ways to learn. Learning from the beginning step by step, the learners will know exactly, but for senior people, it is hard because it is rather slow. For me, this strategy was successful and I also advise other older people to learn in this particular way for I am sure they will enjoy success too”.

(Interviewee E, a male Assistant professor)
4.3.4.8 Summary

In this section, quantitative and qualitative results from respondents revealed Thai senior educators' opinions regarding the best way to learn ICT. Overall, it can be seen that they believed Method 3, Workshops in small group training with one mentor in each group is preferred. Learning in a small group is easier because people can be placed in each group according to levels, participants are less likely to feel bored, shy or nervous because they have friends with similar skills and ages to confer with, share ideas, knowledge and analyse problems between themselves or with their tutor. Method 2, Workshop by peer to peer training in groups with one peer and one trainer in each group, was the method respondents chose next. Even though respondents said that it had similar advantages to Method 3, it costs more expensive. Methods 4 and 5, Self learning by using E-learning or with CAI and Learning from an instructional book respectively, were chosen less than the other methods. However, the percentages of respondents who selected them were similar for Method 4 and 5. They can decrease problems of concerned Thai senior educators about limitations of time, place, travelling and the skills of learners. In addition, people were concerned about disturbing other learners if they could not follow lectures. Very few respondents chose Method 1, the intensive course because they were concerned about the large number of learners, time limitations, and difficulties in following the class when they lost concentration during lessons.

Furthermore, from many suggestions from the qualitative results involving opened-ended questions, it can be concluded that learning by asking other people whenever there is doubt and taking notes and practising is an alternative suggestion, confirmed by Thai senior educators as successful. People who can give advice can be experts or even their children. Learning by using technology media such as satellites or television programs are other choices. A club for senior people to exchange knowledge, information and communication technology, learning and evaluating results to catch up, should be available regularly. Providing opportunities for senior educators to try new ICT programs or ICT hardware in public are also needed.

More suggestions received from the In-depth interviews were categorized into four issues as follows:
First, the learning styles of Thai senior educators are generally the result of workshop training, personal study, and by asking people.

Second, the difficulties in learning ICT for Thai senior educators are the lack of ICT facilities, including hardware and software, the handbooks are not easy for them to understand, and there is a lack of other facilities such as user name and passwords to access the Internet.

Third, appropriate ways to learn ICT are learning in a small group or a club with members of the same age, Entertainment learning or using self-learning tools such as suitable CAI are needed, and mixed methods, the advantages of various other methods is also advised by Thai senior educators.

Finally, other suggestions from Thai senior educators that should be noted; they will use ICT when they feel it is convenient, when they have time, when they have an advisor, and when they have goals and know what to learn. Moreover, the skills of learners and other factors influencing this particular age group, as discussed previously, should be noted.
CHAPTER 5
DISCUSSION AND CONCLUSIONS

5.1 Introduction

This chapter includes a discussion of the results from Chapter 4 and the conclusions of the study. In the discussion, quantitative information, qualitative information and the literature review will be integrated with the analysis and discussed for each research question. The final section, the conclusion, consists of a summary of the study and its findings and ends with recommendations for further study.

5.2 Discussion

The results in Chapter 4 presented facts and opinions of Thai senior educators about using ICT in their professional lives according to each research question. In this section, results from the analysis of the data in Chapter 4 and the literature review will be discussed. Seven research questions will be dealt with separately. Number 1-6 concern the professional goals of senior educators in Thailand and Question 7 illustrates their beliefs regarding the best way to learn ICT.

5.2.1 Research Question 1:

"What are their professional goals?"

Research Question 1 is the first main research question in this study. This section will discuss and explain what the professional goals of Thai senior educators are. The tool used to investigate the answers is a questionnaire, consisting of quantitative data, qualitative data from opened-ended questions, the data correlation of questions and data from in-depth interviews.
This study focuses on senior educators in Thailand aged sixty and over. Most of Thai public servants over sixty will retire, the official age for retirement, and will stay at home and others enjoy life with their children without any permanent work. Data from Research Question 1 shows that many Thai senior educators are different. Even though they have retired, the majority do not want to stop working but to continue in their professional life because they believe their current skills and abilities can be of service to the community. This is good for senior educators and for society too. It is similar to the results of the correlation coefficients that Thai senior educators who think their current skills and abilities can continue to be used to support their work in their professional life are willing to keep working. Moreover, the results found five years, or for as long as they can work, are appropriate periods for them to continue to work according to their needs and health.

Regarding the activities they wish to do in which they were involved before retiring, time and work loads are the important factors for them to consider. Even though the data from the correlation shows most of the activities they wish to do in the future or are doing at present, are similar to those they did before retiring, the percentages of some activities are less than the activities they did in the past which concerned classroom lecturing, work entailing curriculum specialists, and administrations. On the other hand, the trend of Thai senior educators eager to work as part-time lecturers, consultants, academic writers, and researchers has increased. Feedback from in-depth interviews revealed the work status and details of senior educators who are still working in educational fields. For example, teaching as part-time lecturers at the university and working for a company or a factory as advisors but not full time work. It can be clearly seen from these results that even though they have already retired, they have free time to work but still need private time. As they are also concerned about their work load, any activities they undertake do in the future should not disturb their personal time and should reflect a lower work load. This study found that their preferred activities were acting as part-time lecturers, consultants, academic writers, and researchers.

This study not only found what activities Thai senior educators intended to do after retiring, but the results from qualitative data; opened-ended questions and interviews showed their opinions about their professional goals. These opinions can be categorized into two main groups.
The first is the professional goals that provide benefits directly for themselves. They maintained that they hoped to continue developing their knowledge and performance in the new technology. One of the reasons is the Government's policy that these people are needed to teach and conduct research in their respective fields (Khaosod, 2002). As they still have the ability to perform and will be supported by the Government to work in their fields after retirement, most of them are willing to continue working as educators.

The second professional goal relates to the benefits they derive for themselves and to society and also includes personal preferences. Feedback from the interviewees also points out that there are not only Thai senior educators' benefits but their professional goals involve using their knowledge, skills, and experience to assist society. For example, they can write academic articles in journals, explore new know-how and learn how to apply to their present job and make it available to the new generation (see the interviewees' transcripts in Chapter 4).

Nevertheless, the results from Research Question 1 revealed that in order to help accomplish professional goals four other factors need to be taken into consideration.

The first factor is convenience. From the results, Thai senior educators like and are willing to work when it is convenient and/or when there are proper facilities to support them. Thai senior educators agree that it is a factor that helps them to decide whether they will follow their professional goals or not.

The second is professional dedication. One participant explained that she loves to be a teacher so much because she can share her experiences with other people, and she would like to see them become good members of society. Participants also indicated that another reason they wish to keep working in their fields, because they do not want to keep their knowledge or experience only for themselves, but would like to let other people know what they have learnt as well.

The third factor is the concern for their students. The absorbed relationship between teacher and pupils is one factor that influences Thai senior educators staying longer in education. Participants explained that they are thinking of their students and that they would like to continue providing them with knowledge as they did before
retiring. Therefore, it can be seen that whenever educators have an opportunity to teach and assist students, they are very willing to continue working in a professional position.

Finally, the personal beliefs of Thai senior educators is another factor that encourages them to continue working in their profession. One participant said that she believes that if we give our knowledge freely, then we will receive good things in return. Another commented that he wants to teach because when he teaches somebody else, he is also practising and gaining knowledge too. Even though each person has his/her own motives and reasoning on this particular point, in the end they would like to continue working to provide knowledge and experience to their students and society.

To sum up, even though the professional goals of Thai senior educators are to keep practising their knowledge and gaining experience and providing them to the public, they are still concerned about time and work loads. In addition four other factors, convenience, professional dedication, concern for their students and personal beliefs also impact on the achievement of their professional goals.

5.2.2 Research Question 2:

"What are their attitudes about using ICT to achieve their professional goals?"

The analysis of the data and data correlations from the questionnaire for this question revealed that the attitudes of Thai senior educators about using ICT to achieve their professional goals tend to be good.

The data collections used 10 Likert scale sub questions to address the attitudes of Thai senior educators toward how much they agree or disagree with the statements in each question as follows.

The first question mentioned "Computers and the Internet now play great roles in education" and the analysis of the results indicated that most participants had highly positive attitudes towards computers and the Internet now plays importance in the education. Only one person disagrees and no one selected strongly disagree with this point. The reasons the majority answered in the same way are today computers and the Internet are common teaching aids in education and the use of these tools provides huge
advantages in supporting their work activities. Oliver (1998) mentioned that computers have been used in this particular setting since the late 60s. Even though some senior educators have not been formally trained in ICT, they have become very aware of its value. Today it is very common to see computers being used in supporting teaching activities. In addition, the literature review also reveals that there are many advantages of using a computer in education, for example, presenting pictures, finding information, or talking to students and colleagues. Moreover, computers can be entertainers for educators too (Geisert & Futrell, 2000). These are the reasons this group of people agrees with the statement in this question.

The second question concerns the statement “It is only suitable for younger people”. Senior educators show by their attitudes that very high percentages strongly disagree and disagree that ICT is an appropriate tool only for younger people because today older people too are interested in using it in everyday life. Many articles in the literature and research support these results. For example, a survey by Age Concern and Barclays shows that two-thirds of IT users who are above 55 agree that the Internet has had a positive impact on their lives (Ageconcern.org.uk, 2002). In Australia, growth in the use of the Internet of people 55 and older is growing dramatically as it is in the United States and Canada (Merkes, 2000). In Thailand, even though the numbers of people over 60 are using ICTs, for example, the Internet, numbers are still lower than other aged groups. However, the highest percentage of Thai Internet users come from IT, education and research careers (NECTEC & NSTDA, 2004) because persons in these careers realize the benefits of using ICTs for various purposes. Participants in this study who are still working in educational environments with day to day contact with ICT facilities think age should not be a limitation for using ICTs.

The third statement is “Everybody should know how to use a computer and the Internet”. These technologies are widely accepted and used in human societies around the world (Nasingkun, 2003). Most senior educators agree that everybody should know how to use a computer and the Internet too as the percentages of either strongly agree or agree are very high. While, the percentages of participants who strongly agree in the next statement that “Educators should know how to use computers and the Internet” are very high as well (75%) for this particular point, no one disagrees or strongly disagrees. These results show that Thai senior educators' views about everyone using ICT are
positive. In addition, as educators, they believe ICT is necessary so they should be familiar with it.

Thai senior educators think ICT is useful for achieving their professional goals. The results show high percentages to support the fifth and sixth statements that “Using ICT helps me to gain more skills, experience, and better performance in my [Thai senior educator] profession goals” and “ICT will provide more advantages for my [Thai senior educator] professional life than disadvantages” respectively. They believe they can benefit from using ICT in several ways, their views being supported by Brown (2005) who state that by using ICTs in education, new ways can be learnt to teach students, time can be saved in lesson planning and administration, and a more comprehensive approach to assessment can be realised.

Even though Thai senior educators think ICT is useful for achieving their professional goals, most are still uncertain about statement seven, “I am quite familiar with using ICT in my professional life” because, like other older people, they are still concerned about using new technology. Heuston (2002) mentioned that poor performance of sensory organs of the body, lack of confidence, fear of embarrassment in training or tutorial setting, and difficulties of transport hinder or may obstruct older people getting used to the new technology. Even if they know ICTs provide benefits to support their professional goals, they have to face these problems, therefore, it may be hard for them to familiarise themselves with ICTs. Researchers and those who have to deal with senior people should take these factors into consideration.

Regarding the statement “ICT is not hard to use if I have a good advisor to guide me”, the results show most agree. While older people are slower in getting used to new technology than younger people, if Thai senior educators have received good training appropriate for older people or know someone who understands the nature of older people very well to advise or ask when they have some questions, then they think using ICT is not too hard to learn. For these reasons, therefore, the results shown in statement seven are the majority of Thai senior educators agree with “I should not fear using ICT”. However, some may still be concerned with the barriers explained in the previous paragraph.
It cannot be denied that today computers and the Internet play great roles in education. For the last statement, in their opinions on "The computer and the Internet are important in supporting their academic goals", they indicated how ICTs can help as will be explained in the next question (How can ICT help them to be successful).

This research question clearly found that the attitudes about using ICT to achieve Thai senior educators' professional goals were likely to be positive as the results can be interpreted that they agree using ICT is a useful activity to support their academic activities and assist in attaining their professional goals.

5.2.3 Research Question 3:

"How much do they [Thai senior educators] believe ICT can help?"

It is clear from Research Question 2 that Thai senior educators have positive attitudes about using ICT for their professional goals. The findings from the data analyzed concerning Research Question 3 (the beliefs of Thai senior educators with regard to how much ICT can help them) are discussed in this section. The analysis used a Likert scale and multiple-choice questions which were classified into eight parts.

The first and second parts of the results in Chapter 4 that concern Research Question 3 focused on how much they believe ICT assists them to achieve their goals. In the first part, the beliefs about using ICT to accomplish Thai senior educators' goals are very high. Most strongly believed that using ICT can increase working convenience, can save work time, can increase the volume of work capability, and enable their work to be done more efficiently. This shows that Thai senior educators realize the benefits of using ICT. The percentages of people who do not accept these benefits are very low and nobody chose "strongly not believe" in this section. The second part seeks respondents' opinions about using ICT to achieve professional tasks by asking about specific task activities that ICT can perform in education. The overview of respondents indicated very high percentages of beliefs about this point as they "strongly believe" ICT can help them in activities. For example, most of them strongly believe ICT can help to customize their own resources to support their teaching, enables them to be inspired and motivated by new and innovative methods of learning, and improves learning and teaching. As regarding designing educational aids and enabling them to follow students’
progress, even though the majority did not strongly believe ICT can help, still believe it can help at a high level. These results are in line with other views in Chapter 2 that ICT provides benefits to educational societies and can support educators in their professional life as well.

The third part concerned hindrances and how much they believed these would obstruct them in using ICT to achieve their goals. Thai senior educators were asked what they think about the following seven hindrances: first, do not own/ have ICT facilities or devices, second, afraid/ lack confidence to use it, third, costly, fourth, have tried but did not enjoy it, fifth, have a disability that makes it difficult, sixth have no interest, and seventh, not enough time. From the analysis of the data in this part, it can be seen that the most important thing that can be an obstruction is that they do not own/ have ICT facilities or devices. On the other hand, time is the final point of concern. A few believe that it could hinder them using ICT because most do not work full time and the results to Research Question 1 indicated in the same way, that they prefer to have some private time and do not have too heavy a workload. Most of the others are not concerned about time limitations because they know they have time to use ICT. However, the important thing Thai senior educators or others who are related to these groups need to take into consideration focuses on ICT devices or facilities that senior educators can use.

Part 4 in Research Question 3 indicated how strongly Thai senior educators believe in the factors that will encourage them to use ICT. From the results, it can be clearly seen that most strongly believe that if learning to use ICT is good or if there are adequate facilities to learn, they are willing to use it to support their professional goals. This result is in line with the previous data in Part 3 that Thai senior educators believe facilities for supporting the use of ICT or to own ICT devices are important. Time is another factor that can encourage them to use ICT because if they have time to become familiar with ICT, they strongly believe this will encourage them to use it. Older persons however may take longer to get used to and work with the new technology unlike younger people whose physical movements and decision making are quicker. Even though they indicated cost is not a main hindrance, most believe that if the costs of ICT and its facilities are reduced, this will encourage more of educators to use it. In addition, the data revealed the majority felt that if they are provided with a more convenient way of learning ICT and if there is exposure to more education facilities, they are willing to use it. In this regard, Thai senior educators need someone who
undersands the nature of older people to train them or who can be asked questions and or discuss their difficulties personally. They do not wish to be trained in a very big class.

The results in Part 5 show how senior educators’ belief in ICT can help them if they were once familiar with it. From the results, it seems that if they have had an opportunity to use ICT, it will not hard for them to apply this knowledge. Nevertheless, to help them become more familiar with it, the factors explained previously should be taken into consideration as well.

Parts 6 and 7 asked how much they believe using ICT can help and if they have an opportunity to use it and do they believe it can help them achieve their professional goals or not? The results show high percentages of Thai senior educators strong believe and believe that ICT can help. Moreover, if they have an opportunity to use it, they are willing to try as everywhere the nature of every teacher is to consistently to seek or try to gain new knowledge.

Using ICT challenges the education system (Jensen, 2003) and also provides great benefits to education (Brown, 2005). From the literature study, there is no doubt why the results in the final par: revealed their views on how ICT can benefit current education as very high percentages show that ICT can benefit educational societies. It can also be said that no matter their age, many different people believe ICT can provide benefits to education.

To sum up, after the discussion of the results of Research Question 3 involving an analysis of this question, the literature review and the study’s research, it can be concluded that Thai senior educators believe ICT can help them to achieve their professional goals. However, some factors such as hardware, training facilities, time, and convenient ways to support them to master ICT need to be in focus with their particular needs.
52.4 Research Question 4:

"What level of ICT do they need?"

Using ICT in education is important for the majority of Thai senior educators. There are high positive beliefs and attitudes towards its use and from the results it can be clearly seen that overall Thai senior educators think ICT is needed for the attainment of their professional goals as well.

They need to use ICT, for example, a computer and the Internet to support their goals. It is widely acknowledged in education that the Internet offers people in these areas great opportunities to increase knowledge from the resources and the functions of the Internet (Forcier & Descy, 2005).

There are many benefits to be enjoyed from using ICT in education and Thai senior educators stated that whatever ICT can do, if it is beneficial they would like to use it but they feel some people know it can help but do not know exactly how they can use it to support their work. This makes them doubtful whether ICT can help them or not. For example, according to the results from an in-depth interview, one interviewee who needed to use ICT stated that he was not sure of the benefits of using it and how it could help his academic work as follows;

"I have never used it because I do not have many classes. When I teach, I provide documents paper and worksheets for my students and sometime use a pen to draw the structure of the chemical formula on the overhead transparency. I am not sure if PowerPoint can do this thing or not?"

In asking about the level of senior educators’ desire to use ICT to help achieve their professional goals, the results show most indicated that they do. This seems to be accepted by the majority because of the high correlations between the levels of their needs of using ICT to help them achieve academic goals and the levels of senior educators’ desires to use ICT to help achieve professional goals stamp the results in this particular point as well.

However, it should be realised that the need to own an ICT device or to use ICT facilities are very important. Previous results show that they need the benefits of ICT to support their goals, but it may be hard because some are still not familiar with ICT. To get used to the devices and facilities is very important. For example, using a computer and the Internet for work may be hard for older people because to know about the
functions of and to use a computer may take time and skills. However, if they have opportunity to use it regularly at home, this may increase their familiarity with it and contact with a computer and the Internet will not worry them. Another reason is because most are part-time, they spend a great deal of time at home preparing rather than at an institute therefore they need an ICT device such as a computer and access to the Internet at home. The percentages of Thai senior educators who need and strongly need computers and internet access are higher than the other choices. Providing them with ICT should be taken into consideration because computers and the Internet these provide links to the use of other ICT they may need and will help them to become familiar with them later on.

The questions in this part also mention other types ICT and of uses that Thai senior educators need such as keeping their work and paper documents in a hard disk or CD ROM, the use of email to communicate with others and to prepare lessons by PowerPoint programs. From the previous paragraph, one factor that will help them become familiar with ICT and be able to use it is they must have their own ICT to practices rather than just only using them for a short time at institutes. Practising using their own facilities will enhance their skills and will support their needs using in other ICT.

Finally, it can be seen that as Thai senior educators the desire to use ICT, most need to become familiar with it to support their professional goals. However, as there are many benefits from using it, it is important to provide them with this information so they can use it according to their particular needs. Another factor is, if they have their own ICT devices, such as a computer and the Internet to practice and use at home, it will increase their knowledge of other ICT which can support their goals later on.

5.2.5 Research Question 5:

"How can ICT help them to be successful?"

This part discusses the results of Research Question 5 why various suitable ICT activities and the use of a computer in tasks can help Thai senior educators accomplish their professional goals.
As regards suitable ICT activities, the results classify these into 3 groups according to the level of their suitability: Very suitable, Suitable, and Neither suitable nor unsuitable. With reference to searching for information on websites, using a search engine to seek information and needing more direction on using ICT to search for information, high percentages of Thai senior educators believe they are very suitable activities for them. New technology influences access to the information in education today and helps speed the link to information and knowledge (Dellit, 2004). This makes it possible to search, or to receive information easier and quicker than ever before. For example, in the past, if a person needed to know something or to search for information he/she may have to go to a library or a bookstore. With the new technology, however, ICT can help them in just only one click of a finger to obtain that information quickly without the need to travel anywhere. They can use the benefits of ICT via online settings in different ways to do that, for example, to search for information from a website or Search engine on the Internet. In addition, using ICT in an offline system such as CAI to get more direction also can help senior educators gain more information and knowledge as well. Another reason, high percentages of Thai senior educators believe in activities such as transferring a photo or data to other people; checking time schedules; making educational arrangements; using VDO streaming, and watching movies or news, and discussing or chatting with other persons are other ways respondents think can help them achieve their professional goals. These particular activities were chosen by respondents as not the most suitable like the previous groups, but the overview was they were also suitable because many had also selected them.

There are activities about which they are uncertain whether they are suitable or not, such as creating a webpage, posting messages on the web board, buying something via e-commerce and registering information. An interesting point is, even though there is no activity that the majority chose as unsuitable or definitely unsuitable, many respondents thought buying something via e-commerce not suitable and definitely unsuitable more than other activities. They maintained these areas are still uncertain as they are quite new and even though they may be more convenient, they are concerned over the security of personal information. In addition, they still do not understand enough clear about these particular online activities. Therefore, as long as they do not share any confidence in these things, it may be hard to convince them ICT can provide them with benefits from these activities.
The second part in this particular section in Research Question 5 is how the use of a computer can help them. Computers provide considerable potential benefits to persons in educations (Geisert & Futrell, 2000). This seems to be acknowledged by Thai senior educators as results to Research Question 6 show that a desktop computer is one of the most suitable ICT devices. However, as a computer can do a variety of functions, the results in this section are discussed rating suitable task activities that can help Thai senior educators achieve their professional goals.

Two task activities can take advantage of using a computer; first, word processing of tests, handouts and other materials and second, presenting lessons, very suitable activities for Thai senior educators as indicated in the results in Chapter 4.

From an overview of the results in this particular question, preparing academic documents by using word processor programs seem to be the first choice for Thai senior educators because they believe it can enable them to undertake many document tasks that they need for their academic activities. As also mentioned by (Geisert & Futrell, 2000), the use of a Word processor in education, makes tasks easier and saves time and results in a high quality of work. These are reasons that can be interpreted why this particular activity can help them achieve goals.

Using a computer to present lessons is another appropriate activity in the view of senior educators. In the past, teachers used a chalkboard for lessons in front of a class and even though overhead transparencies were used to replace this method later, today using a computer enhances teaching more than past methods. Another reason Thai senior educators believe this activity is suitable and can help them to achieve their goals is the influence of a considerable numbers of software packages that support computers. In presentations, for example, PowerPoint permits the use of graphics, animation, and sound. This program was created by the Microsoft Corporation Company and it is the most popular software currently being used by many lecturers (Gibbs, 2002).

In addition to the features already mentioned, other ICT activities using a computer are keeping records or storing information, preparing lesson plans to facilitate project-based learning activity, communicating with colleagues, participation in online professional development, searching for information for students, assessing a student's studies, seeking peer-to-peer advice and counseling. Even though these activities are not "very suitable" in most Thai senior educators' views, however, high percentages still think they are "suitable" and combined with percentages of "very suitable", and
“suitable”, it can be seen that these ICT activities can help achieve professional goals as well.

There are, however, respondents who think some ICT activities are “unsuitable” and “definitely unsuitable”, for example, buying via e-commerce, using a computer to communicate with students and parents of the student and to communicate with administrators. Some respondents do not understand clearly what ICT activities in each question refer to because they are not familiar enough with ICT and the activities it can undertake. It is hard, therefore, for them to indicate their views in some questions. There is a small percentage of missing data for some respondents did not choose to indicate any opinion in the questionnaire.

In summary, as found in Research Question 1, Thai senior educators are concerned about convenience and are not comfortable if they have to work with unfamiliar new technology, even though some are interested in and familiar with it, they are not big groups. Professional dedication is one factor that causes them to decide to work with or have contact with ICT in their present life. If they are interested in it or if their duties require ICT to support their professional goals, then there will be groups we have to focus on because they know how ICT can help them. Furthermore they can be trained to apply the benefits from ICT towards the achievement of their professional goals. On the other hand, people who are not interested in or not familiar with the new technology, may think it is not very suitable and do not need to use it because they think the accustomed technology is enough. For example, using a telephone is easy and enough for them to contact other persons. If there is anything requiring technology skills, they will ask other people such as their staff or their children to do it for them. These particular groups may find it hard to become familiar with the new technology, however, if it can be shown how ICT can help them achieve their professional goals more and if they can realize the benefits of using ICT, it will encourage them to develop their skills even though they may not be as competent as people who are interested in ICT. They need to consider what ICT will be suitable and what it can do to help them to succeed. This is addressed in Research Question 6 in and will discussed in the next section.
5.2.6 Research Question 6:

"What appropriate ICT do they need to succeed?"

With the rapid development of ICT today, it can be seen that many devices and software are assisting educators in their academic activities. Each type of ICT has various benefits and functions depending on goals. However, for some senior educators who are not familiar with this new technology, not every type will be suitable because it may be thought some may be hard to use and there is not often much chance to use them. Therefore, to consider what ICT they can use, how often they use it and how much they believe a particular ICT can assist in the accomplishment of their professional goals, is important. These factors will help them understand what ICT is suitable.

The data correlation in Chapter 4 between Thai senior educators in this study who believe ICT can assist them to achieve their professional goals and how often they use it are investigated in Research Question 6. A cell-phone is thought to be one of the most useful ICT devices being used widely in today's educational societies. With its multiple functions, senior educators have an opportunity to select what functions they feel comfortable with and employ them to support their professional goals. The results show that they think this tool is a suitable form of ICT for them. Another device, a computer provides many advantages for education (Geisert & Furell, 2000). From the results, there are strong indications supporting this particular point, most educators use desktop computers often and believe they can assist them in reaching their professional goals, thus a desktop computer is appropriate for their use. In addition, the results in this section revealed that a printer and a scanner are also considered suitable devices because these powerful tools can enhance a computer's applications. A scanner helps import data from the outside and transfers it into a data format that can be read and used with a computer. A printer helps educators present data in a document format which can be applied to work with other academic tasks according to each person's needs. Even though today a PDA (Personal Digital Assistant) is one of the most popular handheld pieces of technology in societies, and in some countries they have been provided to staff to support a variety of educational needs (Lamb, 2000), in Thailand the cost of this particular device is still high and the Government does not yet plan to support educators with this kind of tool. Therefore, in Thai senior educators' views, this tool may not be
appropriate at the moment compared with other ICT devices such as a desktop computer, a printer, or a scanner.

For Thai senior educators to gain benefits from computers, software tools are necessary. The results in Chapter 4 indicate that three software packages are considered the most suitable, the Word processor, Software presentations and Spreadsheets, as they can support educators in various ways.

In the literature, Geisert & Futrell (2000) detail the use of Word processor programs that help educators in preparing instructional materials, worksheets, reports and saving data into electronic files. Time and space are saved and it is easy to print them out. Spelling, errors and grammar errors are checked too.

A presentation software tool is another program that is also used in education as it enhances and enriches classroom instruction in every subject area (Gibbs, 2002). In the majority of Thai senior educators’ views, this software is suitable to support their professional goals even though some have trouble using the program, they said they do not have adequate skills or are not familiar with preparing lessons using this program. They are willing, however, to try and often obtain help from staff at their institutes (or from their own children).

Spreadsheet programs have become very popular software. They allow users to calculate, organise data in columns and rows and collect them in electronic worksheets and provide a variety of useful statistical function to create bar charts, and graphs (Shelly et al., 2006). The majority of Thai senior educators think this software tool is appropriate because it is popular in the education setting and having used it, realize its benefits to support their professional work. Some do not know how to use this program very well but still wish to learn it because they know it can help their work.

Other software tools provide benefits for education, for example, CAI, Search engines, Graphics and multimedia programs, however, results show that Thai senior educators’ interest in these are at medium level. Even though these tools are not seen as appropriate software tools for this group at the moment, it does not mean they are definitely not appropriate. On the other hand, a few lecturers think they are of use. CAI,
Search engines, Graphics and multimedia programs should, therefore, also be taken into consideration for they may suit them in the future.

Finally, interest in Calculation programs and World Wide Web browsers can be interpreted that they are not suitable software tools for Thai senior educators.

5.2.7 Research Question 7:

"What do they [Thai senior educators] believe will be the best way for them to learn ICT?"

Research Question 7 asked educators' opinions on what they believe is the best way to learn ICT. It investigated methods of learning to help researchers, and course developers understand it and why it is a suitable way. The answers can be applied in preparing appropriate training courses that will help groups get used to the new technology. It will provide useful data for researchers who are studying related topics.

As the results of this particular part were presented in quantitative data from the questionnaire data from opened-ended questions and in-depth interviews in Chapter 4, the results of this section are discussed as follows:

The questionnaire contained the following five scenarios for Thai senior educators covering all suitable current methods that can be used to learn ICT:

Scenario 1 Workshop by a lecturer in front of the class
Scenario 2 Workshop by peer-to-peer training in groups with one peer and one trainer in each group
Scenario 3 Workshop in small group training with one mentor in each group
Scenario 4 Self learning by using E-learning or with CAI
Scenario 5 Learning from an instructional hook asked Thai senior educators

The results found that the usual learning styles of Thai senior educators have been by workshop training, self-instruction, and by asking people. However, in the survey of their opinions on the five scenarios in Chapter 4, the majority of them chose Scenario 3 to be their favoured method. The results found that Scenario 2 is also a popular choice. Respondents selected these methods because they used small group
training as it is easy to place people into groups according to the difficulty of the lessons based on a learner's ability. This is good for themselves and for lecturers, progress can be swifter because learners have the same skills and are not concerned with their own speed in relation to other learners. In Thailand the number of senior people who use ICT is still low compared to other age groups (Sungsri, 1999). Even though they may be of the same age, there are different skill levels and in small groups, they believe it is easy to classify levels and put them into small groups rather than have a big group.

Moreover, they said that by learning in a small group, they have more opportunities to exchange ideas, knowledge, information and analyse problems between members of their group in a short time. In a large group training course, it is hard to do this if members do not understand the content or fear disturbing others in the class. A lecturer may give opportunities to ask questions but this cannot be done too often. Another point is they feel less stress learning in small groups because they can ask questions directly to the tutors who can monitor them without causing them to be shy or nervous and they do not have to worry about disturbing other people in the class or stop the lesson while they asking questions.

Scenarios 3 and 2 have similar advantages, however, some differences between these methods cause Thai senior educators to think Method 3 (in small group training with one mentor in each group) is more suitable than Method 2 (Workshop by peer to peer training in groups with one peer and one trainer in each group). First, in learning in small groups, Thai senior educators feel entertained because they have friends of the same age and it is better than just talking to only 2 people in a group. This was indicated by many respondents in the interviews who stated that it is a normal characteristic of senior people to need to have friends to talk to. Secondly, learning in a workshop by peer to peer training in groups with one peer and one trainer in each group is costly. This method not only needs preparation by tutors for each learner, but also has to take into consideration lessons, places, and times for each learner as well, whereas, Method 3 can reduce costs. These are the reasons Thai senior educators chose workshops in small groups with one mentor in each group as the best method.

The percentages of respondents who choose Method 4, Self-learning by using e-Learning or with CAI and Method 5, Learning from on instructional book are at medium level. These methods provide certain advantages, in that they do not have to be concerned about the speed of learning or limited time availability. In addition, for
self-learning methods they can learn anywhere and at anytime. Method 4 requires learners to use computer technology and it seems they can be attracted by the entertainment factor in lessons. The results in general show Thai senior educators still want to communicate with other people rather than to study alone. Method 5 is a very simple technique that anybody can follow without any advisors or technology in support. However, the results indicated that to study from text books or instructional handbooks, Thai seniors educators need to learn by themselves which may be hard because if they have any questions, they cannot solve them by themselves and sometimes it is not possible to contact experts who know about a particular topic. In addition, the method makes them feel bored because they have to study alone and according to feedback from the interviews, they prefer to have friends with whom they can confer.

Only 4 people chose Method 1, a Workshop by a lecturer in front of the class, a common way to train people. It is a simple and intensive way which can be completed in one or two days and is good for a person who has some background or skills in those particular topics. However, in Thai senior educators’ views, this method may not suitable because of the levels of the skills of the learners, the large number of members in the courses and the fact that they have to concentrate a great deal on the contents otherwise they may not understand.

In-depth interviews were conducted to obtain further information to explore respondents’ answers and to support the quantitative results. A great deal of the extra material from the in-depth interviews can be classified into four issues; learning ICT, the difficulties in learning ICT, the appropriate way to learn ICT and other suggestions. These areas are discussed to complement the questionnaire information and to cover the aim of this particular research question.

Information from the interviews revealed some interesting suggestions that could be applied to learning methods. For example, learning in small groups by providing knowledge and entertainment, called Edutainment learning, is interesting. There could be clubs with members of the same age where learners will not only receive knowledge from joining in, but also are provided with entertainment from friends and tutors. These factors can make them feel more comfortable and help decrease stress and
nervousness when they are learning ICT. The clubs could be in their institute or set up somewhere outside.

The most appropriate learning methods are mainly in small groups, as seniors prefer a compromise with entertainment and knowledge in the lessons. However, another suggestion interviewees mentioned was using a variety of methods to support learning. It is a good idea to use mixed methods for Thai senior educators, for example, using self-learning tools such as suitable CAI, or practising from instructional books or using technology media such as satellites or television programs, all other choices on training courses. Nevertheless, these particular media must be attractive and designed specially for these groups to put them at ease, to create a friendly atmosphere and make it easy to learn.

In addition, some senior educators are still concerned about problems they may face when they are practising ICT. One interesting idea that can solve this problem is asking other people and taking notes and practising. Although this method seems simple, Thai senior educators confirmed it was as successful during the interviews. People who can give advice directly can be experts, their children or a tutor from a club.

Finally, regarding the discussion of the results from the quantitative and qualitative data for Research Question 7, it can be concluded that for Thai senior educators, the most appropriate way to learn would include the mixed method, learning by integrating in small groups with an entertainment environment, providing opportunities to confer with persons who can answer questions in the use of ICT and the chance practise by themselves with the media designed for these particular groups. There should be consistency in the method and results should be evaluated regularly so that Thai senior educators can learn how to use ICT.
5.3 Conclusions

This section starts by summarizing the purpose, significance, methods and results of the study. It also includes a discussion of the implications concerned with the use of ICT by Thai senior educators and the limitations of the study. Finally, recommendations are provided for further study.

5.3.1 Summary of the study

This study was initiated to investigate the use of ICT by Thai senior educators and to discover their beliefs, attitudes, and level of needs. It also explored appropriate ICT and the best way to learn to use it. The study focused on case studies of senior educators in Bangkok, the capital city of Thailand and its surroundings where there is central use of ICT and where facilities are good.

The study reveals significant results that can help Thai senior educators themselves and persons associated with these groups to understand how ICT can enable them to reach their professional goals. It also assists course developers and designers to make aids and conduct training courses to assist them to get used to appropriate ICT. In addition, once familiar with ICT, Thai senior educators can feel easier living in our modern society.

The results of the study answered the two major research questions. The first major question concerned their professional goals and this group consisted of six questions. The second concerned the best ways to learn ICT. The questions and the results are summarised as follows:

Research Question 1: Professional goals

The professional goals of Thai senior educators are to use their knowledge, skills and experience to support both their current and future activities, because the majority believed that their current skills and abilities can continue be used to support their work in their professional life and they are willing to keep working. In addition, this particular finding also reveals that Thai senior educators view their professional goals will benefit both themselves and society. They know they can use their abilities and would like to
continue working for at least 5 years or as long as the work is similar to what they had been doing before retiring, albeit with a reduced workload. The participants detailed the motivating factors that led them to continue working in categories such as convenience, professional dedication, concern for students, and personal beliefs.

Research Question 2: The attitudes of Thai senior educators about using ICT to achieve their professional goals.

From the results in this particular issue, it can be seen that the attitudes of Thai senior educators tend to be positive. They agree computers and the Internet now play great roles in education and are important in supporting their academic goals. ICT should not just be for younger people for respondents thought everybody should know how to use a computer and the Internet, especially educators. In addition, they acknowledged that using ICT can help them gain more skills, experience, and enable them to give better performance in their profession goals because they think ICT will provide more advantages for their professional life than disadvantages. They indicated that not all senior educators are familiar with ICT but it is not hard to learn how to use it if they have good advisors to guide them. This, however, may not be enough because some are still unsure that just providing an advisor may not be enough to help them learn ICT.

Research Question 3: The beliefs of Thai senior educators in using ICT for their professional goals

It can be seen that the majority of Thai senior educators believed at high levels that using ICT is helpful for them and for education in society. ICT is accepted by most respondents as it can help them in a variety of activities that relate to their professional goals. They also believed if they have an opportunity to use ICT, they will try it because once they become familiar with it, they believe it will help achieve their professional goals more easily. Moreover, to own or to have ICT facilities or devices is very important because without them, there are barriers for them to learn ICT. In addition, they state that being afraid lacking confidence to use ICT, or if the cost is too high and if time is limited, also hinder them from using ICT. On the other hand, as an incentive, most respondents believed that if there are better learning facilities for ICT, or if time spent learning to use it is appropriate and the cost is cheap, they are willing to learn.
Research Question 4: The needs of ICT by Thai senior educators

Overall Thai senior educators' needs of ICT in their academic life is at a very high level. Furthermore, the percentage of senior educators who do not need and who definitely do not need ICT are very low. Some factors could have influenced these negative responses, maybe they do not have enough information about the variety of benefits from using ICT to help them achieve their goals and some have had no previous experience of ICT. However, these groups state there could be a need to use ICT in the future if they are provided with more information.

Research Question 5: How ICT can help Thai senior educators to be successful in their professional goals

The results indicated that ICT can help Thai senior educators in many suitable tasks and activities to accomplish their professional goals. Most respondents think that searching for information on websites, using a search engine to seek information and gaining more direction are suitable. In addition, using a computer can help them in many professional tasks too. To support their task activities, most respondents agreed Word processing was helpful to manage and organize tests, handouts, and other materials and giving presentations in class are considered very suitable.

Research Question 6: The appropriate ICT do Thai senior educators need.

The strong correlations of ICT often used by Thai senior educators and their beliefs these particular tools can assist in the accomplishment of their professional goals. It can be concluded that a cell phone is considered to the most appropriate ICT device but a printer, a desktop computer, and a scanner also are necessary. The most suitable software tools for Thai senior educators are a word processor, software presentations and spreadsheets. On the other hand, ICT devices and software tools that are not considered suitable are CAI and calculation programs.
Research Question 7: The best way for Thai senior educators to learn ICT

This, the second main research question area, concerns the beliefs of senior educators in Thailand regarding the best way to learn ICT. The results illustrated that the majority believed Workshops in small group training with one mentor in each group is the best way to learn. Workshops, peer to peer training in groups with one peer and one trainer in each group was the method respondents chose next. Self-learning by using E-learning or with CAI and Learning from an instructional book were chosen at a similar level but less than previous methods. Very few respondents chose Workshops with a lecturer in front of the class.

Furthermore, from many suggestions from the qualitative results involving opened-ended questions, it can be concluded that learning by asking other people and taking notes and practising is an alternative and was confirmed by Thai senior educators as successful. A club with regular meeting for senior people to catch up with learning and to evaluate results, and opportunities for senior educator to try out new ICT programs or ICT hardware were other suggestions.

Four other suggestions came from the In-depth interviews. First, Thai senior educators generally like to learn in workshop training, by themselves, and by asking people. Second, there are difficulties in learning ICT as the result of a lack of ICT facilities, hardware, software, and instruction handbooks, so more facilities are needed. Third, learning in a small group or a club should contain of members of the same age and include Education learning and self learning tools such as CAI. Fourthly, methods should be mixed and convenience, time and good advisors should be considered.

5.3.2 Implications of the study

Most research about the use of ICT that has been published today mentions only ICT for current educators or has been confined to limited research conducted on specific senior persons and their use of ICT. This research chose case studies of senior educators in Thailand, a specific career of lecturers who need to use ICT at higher levels than others in the same age group and aims to investigate their use of ICT. Therefore,
it is important that the results be relevant and able to contribute to education in Thailand. It involves research and literature on how ICT can be implemented for education. This will be potentially important for both themselves and the education system.

This study reveals the importance of providing ICT training and support for senior educators to ensure they remain active academics and are a valuable resource in the education system. It recommends that basic computer literacy and software applications, for example, Windows and its main functions should be taught to Thai senior educators in the initial stages of their ICT training. More specific software and other ICT tools should be introduced according to the needs of the particular groups. It should show the benefits of ICT and illustrate how it can help them achieve their professional goals because as they learn more about ICT, they will realize what other aspects they need to learn and how they can apply to them. This will motivate them to learn and make it easier for them to choose what devices and software tools are suitable or what they need to learn first. This concurs with a Bangkok UNESCO report that states:

Training programs should always start with an introduction of the rationale and purpose of using ICTs in teaching/learning, the role of teachers in the new ICT environment and how they can benefit from the use of ICTs, even before the technical aspect is given. Experience in certain countries has shown that without the motivational push, teachers do not bring back what they have learned into classroom application.

(UNESCOBKK.org, 2006)

Hardware and facilities to support educators to use ICT are also suggested in this study and cost should be taken into consideration too. A computer was acknowledged by the majority of Thai senior educators as a necessary ICT device to help in attaining their professional goals. The Government of Thailand has launched the “ICT Computers for Thais project” providing low-cost computers to low and middle income families, students, and civil servants (Thai Rath.co.th, 2004). However, there should be a similar project for senior educators as well. The Internet is also very useful but, the costs of Internet facilities and service fees in Thailand are still a worry and can hinder its use. Senior educators need to be provided with opportunities to use the Internet and to play with and become familiar with its benefits to be encouraged to use it. This can be conducted by providing login accounts from their faculties to access the Internet from their homes. Once they are familiar with it, some may decide to shift to high speed
The policy and planning to encourage people to use ICT should support Thai senior educators' needs as well. Tinio (2003) suggested that to implement ICT for education, policy and planning have to concentrate by demarcating both drivers and hinderers for current institutional practices and arrangements and consider the financial resources needed to prepare to support the projects. For this study, the Thai Government and institutes should take these points into consideration as well. Forming the policy and the regulations also mention authorities have to support senior educators providing financial resources for the long term. Budgets need to be prepared regarding promoting ICT to support training courses and the staff. Finding sponsors who will support them is an alternative way to get financial backing.

The best way for senior educators to learn ICT should not use only one method. Even though this study indicates that Workshops in small group training with one mentor in each group is the most preferred way, there are advantages from other methods as suggested by many participants. Therefore, to enable learning to take place, "mixed learning" is recommended and taken into consideration by course developers, teaching aid designers, teacher trainers, and people in organizations concerned with these groups. In addition, the results of this study mention the learning style called "Edutainment" a system which can enhance motivation to learn ICT. It can be arranged in the form of a club or a society in a friendly environment which includes entertainment and knowledge. Mixed learning allows various learning methods and should be provided during club activities.

Small workshop training with a tutor who can give advice to each group and self-learning by giving opportunities to practise with facilities that can support them should be organized. Using new technology such as projectors, wireless teaching tools, or CAI to support these particular settings will help them become familiar with the technology they are learning in the course. However, the report of ICT in education by UNESCO BKK.org (2006) also suggested providing instructional books, another good way to facilitate learning ICT. This study also agrees with this particular issue as many Thai senior educators mentioned that they prefer to learn or practise by this method. Learning in a small workshop with their friends and with a mentor, they gain both education and entertainment. To practise lessons learned before workshop training by using instructional books will allow them accumulate lessons rather than starting from zero and it will mean they will not miss contexts after
the class. Therefore, more than one method should be used and a variety of programs should be provided to cater for the learning styles of the class so that no one is left out without a way to learn that suits them.

To this end, it can be clearly seen that Thai senior educators' use of ICT provides benefits to them and also to education if it can be implemented but to succeed, certain factors need to be taken into consideration and must be cooperation from the Government and from organizations who have a duty to support these particular groups of people.

5.3.3 Limitation of the study

No one method can satisfy all the needs of the researcher (Hawthorne, 1992) therefore, he/she has obviously to concern him/herself with the scope and limitations of the study. This research is also limited by several factors that mean the results will not be the same if repeated with different groups.

First, the study was conducted with Thai senior educators in universities in Bangkok, Thailand who are 60 or above, as it regarded sixty as the official age for retirement of Thai public servants. If it were conducted with people in other careers or people who are not in the retiree group, the results would not necessarily be the same.

Second, the study was limited to Bangkok where ICT facilities in Thailand are at present very good compared to the provinces. The findings may not be generalized to other Thai senior educators in other parts of Thailand or other countries where the technology and the use of ICT may be different.

Third, new technology has been rapidly developed in today's societies, therefore, many ICT devices and software tools are being presented to support education. This research did not cover all aspects of ICT around the world and did not include any discussion of forthcoming products. This study, therefore, focused only on ICT that is currently being used in the educational field in Thailand.

Fourth, although this study has attempted to determine current ICT knowledge and awareness, past experience with ICT as well as support provided in professional development may have had an effect on results.
5.3.4 Recommendations for Further Study

This section consists of recommendations for further study as suggested by the present study.

First, this study was limited to the investigation of the use of ICT by Thai senior educators who live in Bangkok and the surrounding provinces where ICT facilities can be supported and the demand is higher than in other places in Thailand. It might not be similar if a study of the same topic were undertaken in other provinces in Thailand where the use of technology is less extensive than in the capital city. As regards to other countries where there are different geographic, economic and cultural demands on the use of ICT, obtaining results on this issue would require additional research.

Second, this is a pioneer study that concerns Thai senior educators and their use of ICT, whereas previous research has been done on senior people or concerned only general educators, therefore, it covers only one perspective of research regarding senior educators in Bangkok, Thailand. It does not focus on senior educators in each specific academic field or each county. These people may different uses of ICT according to their skills, experience, and needs. Much further study is required to investigate their use of ICT.

Finally, the results of this study reveal interesting and useful information regarding the use of ICT by Thai senior educators. Hopefully, this might be the starting points for further researchers, course developers and teaching aid designers to use in designing training courses and creating teaching models for experimental research later on.
REFERENCES


Campbell, P. (2002). The older generation and the European information society: Access to the information society (Final project report): Activity Center ISA and Promotion Office ISPO.


technology in schools and colleges. *Journal of Information Technology for Teacher Education, 8*(1), 51.


APPENDIX A

Glossary of terms
Glossary of Terms

Thai senior educators / senior educators: The sample group in this research consists of Thai lecturers in universities aged 60 and above who are working full-time, part-time or those who have retired but still have the desire and ability to work and contribute to society. The samples were taken from selected senior university educators living in Bangkok. The term “Thai senior educators” in particular may not refer to all Thai senior educators, rather only to those for whom a similar set of circumstances as the participants in this study applies.

Professional life: In its general meaning, professional life means a career in industry, commerce, or professional activities (Farlex, 2004). Professional life in this study refers to the activities that have made them professionals based on their experience and involves educators who have been researching and teaching. It includes both academic and research activities.

Academic activities: The present activities of educators in their work, for example, teaching in a school or tutoring.

Research activities: The present activities of educators or researchers that involve the systematic investigation, including research development, testing and evaluation, designed to develop or contribute to general knowledge. In this study research refers to the activities that educators have been undertaking in order to support their professional life in educational fields both in and out of school time, and perhaps all their life.
APPENDIX B

A copy of the questionnaire survey (English translation)
QUESTIONNAIRE SURVEY
Dear ..........................................

You are invited to participate in this survey "An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand", part of the requirements for Doctor of Information Technology degree.

This survey will take approximately 30 minutes to complete and the study concentrates on how senior Thai educators use ICT to attain their professional goals and goals in their academic life. You are a senior Thai educator who has been chosen at random to participate in this study.

The purpose of this survey is:
1. To explore your beliefs in using ICT for your professional goals.
2. To explore your attitudes in using ICT to achieve your professional goals.
3. To explore the level of your needs of ICT in your academic life.
4. To explore what ICTs are suitable to support your goals.
5. To explore the best way of learning how to use appropriate ICT in your life.

The information from your comments will be used to complete a Doctoral student thesis. Your participation in this study is completely voluntary. You may decline altogether, or leave blank any questions you do not wish to answer. The Approximately 10 respondents who have provided meaningful comments, interesting data and a range of opinions will be selected for an in-depth interview. There are no risks to participation beyond those encountered in everyday life. Your responses will be confidential and the data from this research will be reported only in the aggregate. No one other than the researcher will know your individual answers to the questionnaire and the interview.
If you agree to participate in this survey, please complete the questionnaire and return it as soon as possible in the enclosed reply envelope. Respondents who provide a successfully completed questionnaire will receive a copy of the summary of research results from the researcher when the study is finished. Your help will be very much appreciated.

Thank you for your time and co-operation

If you have any question about this study, please feel free to contact the researcher at:

Nattavee Utakrit: the researcher
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia
Personal telephone: [redacted]
E-mail address: nutakrit@student.ecu.edu.au
Introduction

This questionnaire includes 5 sections as follows;
Section 1: Your profile
Section 2: To explore your beliefs in using ICT for your professional goals
Section 3: To explore attitudes in using ICT to achieve professional goals
Section 4: To explore the level of your needs of ICT to achieve your academic goals
Section 5: To explore what ICT is suitable to support your goals
Section 6: To explore the best way of learning how to use appropriate ICT in your life.

Section 1: Respondent profile
Please put a check mark (✓) in the box that you choose or write in the spaces provided

Sex □ Male □ Female
Age ..........

1. What was your last or current educational position?
   □ Professor □ Associate Professor
   □ Assistant Professor □ Lecturer
   □ Other (Specify) ........................................

2. Do you think your current skills and abilities can continue be used to support your work in your professional life?
   □ Yes □ No □ Not sure
3. Will you keep working to support your professional life? If yes, please describe your professional goals.
   □ Yes (please describe below then go to Question 4)
   □ No (then go to Question 7)
   □ Not sure (then go to Question 5)

Your professional goals are

4. How long do you think you want to continue to work?
   □ 1-5 years       □ 6-10 years
   □ As long as I can □ Do not want to work (then go to Question 7)

5. Which of these activities are you currently doing that involve your educational skills and abilities? (Check more than one if applicable)
   □ Classroom lecturer □ Instructional Aid design and development
   □ Curriculum Specialist □ Special Education Lecturer
   □ Administrator □ Researcher
   □ Academic writer □ Consultant
   □ Others (Specify) ........................................................................

6. Which of these activities do you intend to do in the future? (check more than one if applicable)
   □ Classroom lecturer □ Instructional Aid design and development
   □ Curriculum Specialist □ Special Education Lecturer
   □ Administrator □ Researcher
   □ Academic writer □ Consultant
   □ Others (Specify) ........................................................................
7. Do you use ICT in your worktime?
   □ Yes  □ No

8. Do you have a computer with Internet access at home?
   □ Yes  □ No
   □ No, but I access in workplace / friend's house or other places

9. Do you have a personal email account (excluding your institute email account)?
   □ Yes  □ No

10. If yes, (for Question 3) do you use your email account to communicate with...
    (check all that apply)
    □ Family  □ Students
    □ Administrators  □ Other teachers at your institute
    □ Professional associations  □ Other teachers not at your institute
    □ Other (Specify)...
    □ Never use an email

11. Would you be willing to participate in an in-depth interview after the questionnaire has been analysed.
    □ Yes   □ No

Please complete the details below so that a summary of the research results can be sent to you and so that arrangements can be made for the in-depth interview.

Name: ___________________ Surname: ___________________
E-mail: ___________________
Address: ___________________
Telephone number: ___________________
Section 2: To explore your beliefs in using ICT for your professional goals

In Questions 2.1 - 2.4 please put a check in the number beside each statement that most accurately reflects your view.

5 = strongly believe  4 = believe  3 = neither believe nor do believe  2 = do not believe  1 = strongly do not believe

<table>
<thead>
<tr>
<th>Question 2.1: How much do you believe that ICT assists in the accomplishment of your professional goals?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using ICT can save working time</td>
</tr>
<tr>
<td>Using ICT increases working convenience</td>
</tr>
<tr>
<td>Using ICT enables work to be done more efficiently</td>
</tr>
<tr>
<td>Using ICT increases work capability</td>
</tr>
<tr>
<td>Other (Specify)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2.2: How strongly do the following statements describe your beliefs about using ICT to achieve your professional goals?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using ICT enables you to design your own educational aids</td>
</tr>
<tr>
<td>Using ICT you can customize your own resources to support your teaching</td>
</tr>
<tr>
<td>Using ICT allows you to follow your students' progress</td>
</tr>
<tr>
<td>Using ICT allows you to communicate with other people easily</td>
</tr>
<tr>
<td>Using ICT enables you to be inspired and motivated by new and innovative methods of learning</td>
</tr>
<tr>
<td>Using ICT can result in improved learning and teaching</td>
</tr>
<tr>
<td>Other (Specify)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
2.3 How strongly do you believe the following statements obstruct you in using ICT for your professional goals?

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not own / have ICT facilities or devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afraid / lack confidence to use it</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have tried but did not enjoy it</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have a disability that makes it difficult</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have no interest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.4 How strongly do you believe the following statements would encourage you to use ICT in your professional goals?

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better learning / education facilities to help me learn ICT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I had more time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If costs were reduced</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If it were a more convenient way to learn ICT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If it would expose me to more education facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I had someone to train me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.5 Once you are familiar with using ICT, do you believe it will help you to achieve your professional goals more easily?

- [ ] Yes
- [ ] No
- [ ] Not sure

2.6 How much do you believe using ICT can help you to achieve your professional goals?

- [ ] Very much
- [ ] Much
- [ ] Not much
- [ ] Do not know
2.7 If you have an opportunity to use ICT, for example, a computer, the Internet, or PowerPoint presentation programs, would you like to try them?

☐ Yes  ☐ No  ☐ Not sure

2.8 Do you believe that ICTs benefit current educational societies?

☐ Yes  ☐ No  ☐ Not sure
Section 3: To explore your attitudes in using ICT to achieve professional goals

Please put a check (✓) in the number beside each statement that most accurately reflects your view.

5 = strongly agree  4 = agree  3 = neither agree nor disagree  2 = disagree  1 = strongly disagree

<table>
<thead>
<tr>
<th>Statement</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers and the Internet now play great roles in education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT is only suitable for younger people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everybody should know how to use a computer and the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educators should know how to use computers and the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using ICT helps me to gain more skills, experience, and better performance in my professional goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT will provide more advantages for my professional life than disadvantages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am quite familiar with using ICT in my professional life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT is not hard to use if I have a good advisor to guide me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I should not fear using ICT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The computer and the Internet are important in supporting my academic goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 4: To explore the level of your needs of ICT to achieve your academic goals

Please put a check (✓) in the number beside each statement that most accurately reflects your view.

5 = strong need  4 = need  3 = uncertain  2 = not needed  1 = definitely not needed

<table>
<thead>
<tr>
<th>Directions: Indicate your level of need to the following statements.</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I need to use ICT such as the computer and the Internet to support my academic life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I need the benefit of using ICT to help me achieve my academic goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I desire to use ICT to help me achieve my professional goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I need my own computer at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I need to access the Internet from home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I need to keep my work and paper documents in my hard disk or CD ROM so that I can easily find and use them later</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I need to use email to communicate with my colleagues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I need to use email to communicate with my pupils</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I need to prepare my lesson by PowerPoint program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I need ICT to support me to achieve my academic goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 5: To explore what ICT is suitable to support your goals

Please put a check (✓) in the box that you choose or write in the spaces provided.

5.1 How suitable are the following tasks in supporting your personal goals?

S = very suitable 4 = suitable 3 = neither suitable nor unsuitable
2 = unsuitable 1 = definitely unsuitable

List of online tasks

5 4 3 2 1

Searching for information on websites
Using a search engine to seek information
Creating a webpage
Transferring photos or data to other persons
Checking email
Checking a time schedule
Making educational arrangements
Need more directions
Posting messages on the web board
Buying something via e-commerce
Registering information
Using VDO streaming, Watch movie or news
Discussing or chatting with other persons
Others (Specify) …
5.2 How suitable is using a computer for the following professional tasks?

5 = strongly suitable  4 = suitable  3 = neither suitable nor unsuitable
2 = unsuitable  1 = strongly unsuitable

<table>
<thead>
<tr>
<th>List of professional tasks</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep records such as grades and attendance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word processing of test, handouts, other materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare lesson plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present lessons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitate project-based learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with students and parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with your colleagues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicate with administrators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participate in online professional development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Search information for your students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct student assessments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seek peer-to-peer advice and counseling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.3 How often do you use these ICT devices to achieve your goals?

- (5) many times a day
- (4) many times a week
- (3) once or twice a week
- (2) once or twice a month
- (1) rarely used

\[N = \text{Never} \quad D = \text{Do not know}\]

<table>
<thead>
<tr>
<th>List of ICT devices</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptop Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Phone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDA (Personal Digital Assistance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Camera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD Burner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television, VDO, VCD, or DVD Player</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Webcam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (Specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.4 How often do you use these software tools to achieve your goals?

(5) many times a day  
(4) many times a week  
(3) once or twice a week  
(2) once or twice a month  
(1) rarely used  
N = Never  
D = Do not know

List of tool software

Computer-aided instruction (CAI)  
Spreadsheet such as Microsoft Excel program  
Word processor such as Microsoft Word program  
Software presentation such as PowerPoint Presentation program  
Graphics and multimedia such as Adobe Photoshop program  
World Wide Web browsers  
Calculations program such as SPSS for Windows  
Search engines such as Google.com  
Others (Specify) ...........................................

6. Have you heard of any other ICT device that might help you improve your personal and academic skills?

........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................
........................................................................................................................................................................................................................................................................................................................................................................

177
**Section 6:** To explore the best way of learning how to use appropriate ICT in your life

Here are five scenarios that describe methods you could use to learn how to use appropriate ICT.

<table>
<thead>
<tr>
<th>Scenario No.</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Workshop by a lecturer in front of the class</td>
</tr>
<tr>
<td>2</td>
<td>Workshop by peer to peer training in groups with one peer and one trainer in each group</td>
</tr>
<tr>
<td>3</td>
<td>Workshop in small group training with one mentor in each group</td>
</tr>
<tr>
<td>4</td>
<td>Self learning by using E-learning or with CAI</td>
</tr>
<tr>
<td>5</td>
<td>Learning from an instructional book</td>
</tr>
</tbody>
</table>
From the above scenario methods, which one do you believe that will be the best way for you to learn ICT? (Please write down the scenario number that you choose in the space below)

Answer: Scenario number ..................

Why do you believe this would be the best method for you?

What other methods would you like to use to learn about ICTs?

End of the questionnaire.

Please accept my grateful thanks for filling out this survey. I value the time and effort you have made. If you have any suggestions or comments to make about the survey, please use the space on the back of the sheet to record them.
APPENDIX C

The semi-instructional interview form

This semi-instructional form was used as a guideline in in-depth interviews after the questionnaire survey had been completed. It will attempt to obtain greater depth of information on the research topic and act as a supplement to data from the questionnaire as there may be additional questions that arise out of the analysis of the questionnaire data.
Semi-Structured Interview form

This Semi-Structured Interview form for in-depth interviews will be used to obtain more information to support the study, "An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand", as part of the requirements for Doctor of Information Technology Degree.

The interview aims to investigate and recommend the best ways of learning how to use appropriate ICT for senior Thai educators. It will take about 30 minutes to complete and a tape-recorder will be used to collect the data.

1. Please give details about your life after retirement from your institute. What is your job now? How many days do you work a week?

Comments:
2. What ICT facilities do you use to support your goals and why do you believe they will help you to achieve your goals?

Comments:

3. How comfortable or how familiar are you when you use these ICT devices to support your goals?

Comments:

4. What obstacles were there for you when you first used these ICT? How did you become familiar with them?

Comments:
5. What other appropriate ICT do you think you need to support your goals and why do you think they are needed?

Comments:

6. If you do not know how to use them, how can you learn to master them?

Comments:

7. Which way do you think is appropriate to learn the use of ICT for your life?

Comments:
8. There are five scenarios that describe methods you could use to learn how to use appropriate ICT.

**Scenario 1:**
Workshop by a Lecturer in front of the class

**Detail:**

**Scenario 2:**
Workshop by peer to peer training in groups with one peer and one trainer in the class

**Detail:**

**Scenario 3:**
Workshop in small group training with one mentor in each group

**Detail:**
Scenario 4:
Self learning by using E-learning or with CAI
Detail:

Scenario 5:
Learning from an instructional book
Detail:

From the above scenario methods, which one do you believe that will be the best way for you to learn ICT?
Why do you choose that method?

Comments:
What steps should be taken for people who want to develop or investigate ICT training to assist senior educators in the future?

Comments:
APPENDIX D

The list of experts
The lists of experts

The content validity of the research tools were checked by experts who are specialists able to make comments on and give feedback about the research tools. Their names are listed as follows:

1. Asst. Prof. Dr. Tuangrat Sriwongkol
   Ph.D. (Instructional Design/Development)
   University of South Alabama, U.S.A.

2. Assoc. Prof. Dr. Kriamsant Whattananarong
   Ph.D. (Vocational Education - Instructional System Technology)
   University of North Texas, U.S.A.

3. Assoc. Prof. Dr. Kanta Phunlapthawee
   Ph.D. (Quantitative Research, Evaluation, and Measurement in Education)
   Ohio State University, U.S.A.

4. Dr. Phayung Mceesad
   Ph.D. (Electrical Engineering)
   Oklahoma State University, U.S.A.
   M.Sc. (Technical Education - Electrical Technology)
   King Mongkut's Institute of Technology North Bangkok, Thailand

5. Piyachat Chokpipat
   M.A. (Evaluation, and Measurement in Education)
   Chulalongkorn University, Thailand
APPENDIX E

NVIVO Models of the interviews
NVIO Model of the In-depth interviews
APPENDIX F

Interviewees' transcripts
Interviewee A: a former university vice president, 62 years old, Female

Personal details

Work status
Question: Good morning, Mrs... May I interview you in more detail? According to what you told me, you have already retired, however, you are still working aren't you?
Answer: Yes, I teach at Master Degree level.

Work details
Question: Is your job similar to the jobs you did before retiring?
Answer: Some are similar. Before retired I was Head of the Master program and was an advisor and a member of the Thesis committee.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I love being a teacher so much. When I just graduated, I worked for international organization and my family and I had many chances to go abroad for work and study. I obtained a great deal of knowledge and experience from this and I would like to share my experience with other people and my students. I would like them to have an opportunity like me and would like to see them to be good members of society.

ICT Facilities
Question: Does your job now have any relationship with ICT?
Answer: Yes it does. Actually, I am not really good in using ICT, medium level using only simple ICT facilities such as email, and searching for information from the Internet for my teaching. However, I have noticed that ICT provides significant assistance for us and I would like to encourage other people to use it.

Familiarity
Question: Do you ever use a software program such as PowerPoint?
Answer: Not very often. I have my TA prepare the PowerPoint for me. I am not good at using it.
Learning ICT

Question:  Right, at first how did you learn to use ICT?
Answer:  At my university I had training courses but I still do not have good skills.

Question:  What kind of training course did you attend?
Answer:  Workshop training

Question:  How many people were there in the class?
Answer:  It was quite a large workshop. There was one expert in front of the class and other mentors helped.

Appropriate ways to learn ICT

Question:  In your opinion, which method do you believe is the best way for you to learn ICT? Why do you choose this method?
Answer:  I think workshop training would be good because we can do it by ourselves at that time. To learn from instructional books or CAI alone may be very slow especially for older people. There is a group of people to teach older people how to use computers and the Internet. The members of this group are all older people. They not only provide the knowledge but they have activities to entertain older people. These will help older persons to overcome the fear of the computer and make them not feel lonely. Older people who have been trained by this group can talk about IT with their children at home and will not feel out of date.

Question:  That means there are regular activities and they must be special for older people. Are they different from normal training?
Answer:  Yes and the participants are the same age.

Question:  And they still need to use ICT too.
Answer:  Yes, because some people have to contact people in other countries.

Question:  Today which ICT resources have you used?
Answer:  Normally, I ask my staff to do for me. I am a user.
Other suggestions

Question: Finally, if there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think this is a good idea?

Answer: We must understand that the nature of older people is they may be slow. They know ICT is important but they are still slow.
Interviewee B: a former university lecturer, 60 years old, Female

Personal details

Work status
Question: Good afternoon, Mrs. .... May I disturb you for a short time? First of all, I would like to thank you so much that you returned your questionnaire. From your questionnaire, I see that you have already retired however, you are still working, aren’t you?
Answer: Yes, a little bit.

Work details
Question: What do you do?
Answer: I am a management advisor for an industrial company and advise on students’ projects. I do not teach any more after retiring because the university requires a degree for lecturers who can remain teaching but I do not have one.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: Whatever I have learnt I would like to let the other people know as well. I do not want to keep it only for myself. Another thing is I believe in that if we give our knowledge freely, then we will receive good things back.

ICT Facilities
Question: Are there any ICT facilities where you work?
Answer: Actually they are related to my work. For example, if we want to know anything we can search it from the Internet. However, I seldom use this kind of tool, I use email but not very often. I like email to communicate with other people to get the information about travel. I travel abroad every year. Actually, it is not too difficult if we learn but I do not have my own computer to practise, for at home it belongs to my grand daughter and she uses it everyday. This means if we do not use something regularly, we will forget how to use it. Chatting by using a chat room on the World Wide Web, for example
Microsoft chatting rooms, is good because there are interactive activities for people of the same age. In fact, people of the same age never or hardly even do this. I do not think other ICT is used very often if senior educators come from other fields such as the Humanities.

**Other ICT**

**Question:** What about searching information from the World Wide Web?

**Answer:** I personally use Google but I would like to tell you, I am not good because I know very little about it. I do not understand about downloading or printing out. However I think I will try to learn and I would like to attend classes. The problem is I have no time but I advise other people to goto learn it.

**Familiarity / Learning ICT**

**Question:** It seems like you are familiar with ICT, how did you learn to master it?

**Answer:** A little bit. The reason I have to use it is because first, I do not want to disturb the children to do something for me. The quality of work from them is not good enough, the format is bad and I have to correct it regularly again by myself. That's why I began to learn. I think I should learn more things and as I have a science background, I would like to seek more knowledge. Everyday I listen to the news from the radio about issues that are interesting such as economics, and technology updates. Some day the programmers invite software developers to talk about management and how to apply IT into business. I like this.

**Question:** May I ask you first time you used ICT did you learn to use it by yourself or did you go to a workshop or course?

**Answer:** I hardly ever take training courses. However, I remember the first time I used IT was in 1992. At that time I used a word processor to report on science projects and some calculation programs to analyse the results from questionnaires. I had to find which way was the most
convenient without other people doing for me and that way was asking people how to use it. For example, how to turn things on, how to print out, how to make a table. Then I wrote it down step by step in my notes. I tried to use it by myself and when there were problems, I phoned to ask. Therefore, on my monitor, I put short notes around. I like to learn by myself and then ask the people. I do not like to open a text book because I think the book sometime is not clear and it is hard to understand. The authors sometime used specific words that are understood by themselves or people who have knowledge. This is the reason I do not use the book. When Microsoft 3.1 software arrived, there was a training course and I was trained. I learned to follow the menu and whenever I got problems, I asked experts. I was also trained in PowerPoint presentation too but I know only a little because I rarely use it. Excel I use regularly because I have to prepare financial documents and I sometime ask my staff and then practise by myself later on.

Appropriate ways to learn ICT

Question: For senior people who want to learn ICT which way do you think is suitable?  
Answer: There is a club for older persons in Thailand which has been set up to train them to use computers and the Internet. Some older people have learnt ICT and now they have many friends on the Internet and they can also teach other older people to use ICT. So it depends on a person’s interests. If we also think we are silly, we will never be familiar with it. If we do not think like that, we may be able to learn. We have to practise many times and if there is any problem, we have to ask an expert.

Question: What about learning from CAI?  
Answer: I think it is a good idea but it may be slow. We have to understand the learners’ skills. If they do not have any, we must balance them. I remember the first time I was trained in PowerPoint. Some lecturers taught based on their understanding. They did not give the reasons why they did this. I could not remember. If they explained, it would
be very so helpful, not only for senior educators who had never used ICT, but also for the young people. It is pity.

Question: What about training courses for older people? Should they be in a big class or in a small group?

Answer: It does not matter, a small or big group, but the thing is, and we must balance the skills of the learners. Second, if we do not balance their skills, we have to pretest them and then put them into the right level. Finally, it is necessary to provide the correct number of tutors or TAs may be 3-10 people a class or sometimes 1 tutor per student.

Other suggestions

Question: Finally Do you have any suggestion for the researcher in this particular issue?

Answer: I am not sure, but I think the other interviewees may have given you some ideas already. For me, I can just say that I am interested in ICT.
Interviewee C: a former university lecturer, Asst. Prof., 60 years old, Male

Personal details

Work status
Question: From your questionnaire details, I see that you have already retired however, you are still working, aren't you?
Answer: Yes, I am

Work details
Question: What is your job about?
Answer: I am a part time lecturer, a trainer, and work for the financial department in my university.
Question: Is your job similar to the jobs you did before retiring?
Answer: There are some things similar for example, being a lecturer, and an advisor for the new colleges.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I still have enough energy therefore, if there is anything helpful that I can do for society, I am happy to do it.

ICT Facilities
Question: Does your job now have any relationship with ICT?
Answer: Good question. I use the Internet everyday because I know that technology has improved rapidly and I have to catch up. The information updated from the Internet can be applied and used for my academic work.

Familiarity
Question: How long have you been familiar with ICT?
Answer: I had to read reports related to this particular issue while I was an administrator for 12 years, a vice president for 9 years and the Dean of the Faculty for 3 years.
Question: That means you were an administrator for almost 10 years. May I ask you how you became familiar with ICT?
Answer: As I told you, technology and science have improved rapidly so we need to catch up. These things are linked together.

Learning ICT

Question: Normally, older people whose ages are similar to you are not much interested in technology, but you are different. Did you learn it by yourself or did you learn from somewhere?

Answer: I was trained. I also like to seek for new information and knowledge from the Internet rather than go to a library.

Difficulties in learning ICT

Question: As you are familiar with ICT, do you have any problems or what difficulties do you experience when you use ICT?

Answer: Mainly, I learn by myself. It was learning by trial and error. Sometimes I learn from textbooks or instructional books and by asking experts. I am not expert in these things just medium level. I am a user, I am working in the education fields and am not good at IT so the problem is my computer skills are not good. This is an obstruction for my work.

Question: To use ICT, these should be facilities to support, shouldn't these? Where do you use these things?

Answer: There are many things. For example, I have a Login name from my university to connect to the Internet.

Appropriate ways to learn ICT

Question: If we have to encourage senior people to use ICT, in your opinion, how can it be done or what methods do you believe are the best for this group of people to learn ICT and get benefits from it?

Answer: I would like to give an example. Nowadays, adult education, lifelong learning, or education related to older people have been already put into the Government policies (1999-2002). Therefore, if we practice regularly, we will not forget it. However, for senior people to encourage them to use ICT, education should be taken into consideration. That means to encourage them we will have to include two things:
knowledge, 2 entertainment.

Question: So which method should be suitable for them?
Answer: Every method is suitable. The computer provides new things for us to learn.

Question: Do you have any suggestions to make in this particular issue?
Answer: A training course is not bad because it has two way communications for while adult are learning with their friends, they will feel entertained.

Question: What size would be good, a big group or a small group?
Answer: Both are ok.

Question: If there is a researcher who would like to develop teaching aids for senior educators to learn ICT, do you have any suggestion?
Answer: It depends on personal interest. We have to study how necessary ICT is for them. The study does not need to focus on only senior educators, it can be any older person. Another thing is we have to provide facilities for them such as user name and passwords to logon the Internet.

Other suggestions

Question: Finally, do you have any suggestions for the researcher in this particular issue?
Answer: Today, technology has many facets, but how can we merge them and encourage people of every age to realise its benefit. This is the important point. The Government should have a policy to encourage people to learn about ICT otherwise we cannot compete with other countries.
Interviewee D: a former university lecturer, Asst. Prof, 62 years old, Female

Personal details

Work status
Question: From your questionnaire, I see that you have already retired however, you are still working, aren't you?
Answer: Yes, I am. I still teach regularly as a part-time lecturer at 3 universities.

Work details
Question: What motivates you to work even though you are already retired?
Answer: I like to work and learn new things.

ICT Facilities
Question: Does your job now have any relationship with ICT?
Answer: We use it as a tool. This means if we have a class, we have to prepare PowerPoint. If you ask me if I prepare it by myself or not, the answer is no. I have done it by myself only a few times and now I have nearly forgotten how to do it. My family helps me.

Question: You prepare the content and ask other people to do the PowerPoint, do you?
Answer: Yes. I have no time to do it. However, I add more details sometimes.

Question: Have you ever searched for the information from the Internet?
Answer: Yes I have. When I want to know something, I will look at the Internet.

Learning ICT
Question: Where did you learn to use ICT?
Answer: Actually, there were courses but my free time did not allow me to attend very much. I was trained once or twice but some I didn't use it. For example, I learnt Excel but I didn't use it. PowerPoint, I have used a little bit. The courses were short courses about half a day for 2-3 days. All the time I learnt by myself. I have text books but never use them. I learn by my trial and error. Even though I want to learn, I could not follow them because there was only 1 lecturer in the class.
and it was inconvenient to ask. If I ask friends in class, it may not be a
good thing because it will disturb their time. Therefore, it seems I did
not really learn. Excel I cannot use but PowerPoint I know a little.

Question: What kind of training course did you attend?
Answer: It was a large group about 30 people and we had to learn at the same
time. The lecturer taught and used PowerPoint but I did not have the
basic skills.

Question: Was there any mentor?
Answer: There was one mentor.

Appropriate ways to learn ICT

Question: If there is a researcher who would like to develop training aids such as
CAI to learn the use of ICT, do you think this is a good idea?
Answer: I think it would be useful. Actually, I have many books both in
English and in Thai but they are not attractive to learners. It would be
good if they were more attractive.

Question: Between that kind of CAI and organizing a workshop or course in
small groups, which one would be suitable for senior educators?
Answer: I will not choose to learn by only one method because learning in a group
with other people such as younger people will cause the class to run
slowly. As I am a bit slow, learning by oneself with instructional
books is good because I can learn without any time limited and do not
disturb other people. However, older people normally stay alone so to
learn in a group, older people will have friends and not feel lonely
because they can talk with other senior people. Therefore, I will
choose the middle way, eg. using multi methods.

Other suggestions

Question: Finally, do you have any suggestions for the researcher in this
particular issue?
Answer: I am sure, it is useful.

Question: Are you still interested in ICT?
Answer: Yes, I am and I think other senior people will think the same as me.
Don't forget to make it attractive with sound and movies these would
be good.
Interviewee E: a former university lecturer, Asst. Prof. 63 years old, Male

Personal details

Work status

Question: May I interview you in more detail? After retiring do you still work in the academic field or not?
Answer: After retiring, I taught for 3 years. Now I have just stopped my teaching, however, I will take it up again if I am required.

ICT Facilities

Question: At present, are you using any ICT facilities?
Answer: Mostly, I use email. I check my email addresses regularly. I had no computer background before and just began learning it when I was about to retire. I can now use PowerPoint to prepare teaching documents. My learning style is so simple. I was trained but I could not understand it. I have to learn by myself and then ask somebody, step by step and practise. When I have any questions, I ask. This is very fast learning and most suitable for older people. To learn based on theory and to teach from the very beginning is difficult because we have to remember everything. I tried it before and I did not think it was suitable for older people. For my style, I can go fast. Just tell me the steps, then I follow and when I have any questions, I will ask. I can learn how to use PowerPoint in a short time.

Learning ICT

Question: That means you mainly learn by yourself and you will ask when you have a problem.
Answer: I ask someone to tell me the steps and then I practise at that time. I am not like young people who can learn in the normal way very quickly.

Question: Did you use PowerPoint since before retiring and after retiring?
Answer: Yes, I can use it tolerably well. Usually, when I begin learning, I will take some short notes how to do it step by step. After that I will practise by myself. I sometimes search for interesting information from the Internet, then I will record it. This information is so useful for my teaching. Another important thing is I have to practise it
everyday. Fortunately, when I was about to retire, there was a computer on my table at my office. I wanted to try it but I did not know how to turn it on, so I just asked other people how to turn on and off. After that, I have practised regularly and taken short notes. After that, I learnt how to use functions. Now I can use it and I also use email to contact my college. It is so useful for me.

**Familiarity**

**Question:** This means you are quite familiar with ICT, such as email, or PowerPoint.

**Answer:** I am a just medium user.

**Difficulties in learning ICT**

**Question:** Is there any training in ICT at your university?

**Answer:** Yes, but it was very hard to learn because it was conducted in a big group.

**Appropriate ways to learn ICT**

**Question:** Could you follow them?

**Answer:** I could but it did not understand very clearly. After that I needed to learn using my method that I told you about. I can go faster than my friends the same age group and learn in the normal way. I practise and when I have questions, I ask. For senior people, I think this method is quite successful and it is better than to learn from the beginning. Because we are old, we need to learn by short cuts. This is my understanding because I have tried myself and been successful.

**Other suggestions**

**Question:** Finally, if there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think is it possible?

**Answer:** As I told you, there are many ways to learn. Learning from the beginning step by step, the learners will know exactly, but for senior people, it is hard because they are rather slow. For me, this strategy was successful and I also advise other older people to learn in this particular way for I am sure they will enjoy success too.
Interviewee F: a former university lecturer, 62 years old, Male

Personal details

Work status
Question: From your feedback, I have know that even though you have already retired however you are still working in the academic fields are not you?
Answer: Yes I am.

Work details
Question: What is your work about?
Answer: I use a computer to develop computer software, create a website by using HTML, and am now writing 2 academic text books about computer application software.

Question: Do you have any class lectures?
Answer: I have stopped teaching for a while because I have to take care my grandchildren. However, when they grow up I may go back to teach again because my faculty is asking me to help them again. Whenever I have time, I will be back.

Question: That means you have used computers before you retired?
Answer: That is right. I am the person who creates and develops lot of software for my university.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I would like to transfer my knowledge, skill and experiences to the new generation as long as I can because if I keep them to myself, I will forget and the knowledge will be lost. Therefore, as I still can work, I do so and provide knowledge according to their requests.

Question: Where did you graduate?
Answer: I graduated in Physics and Mathematics from the USA in General Science. I had chance to take courses about computers while studying at the university. After graduating, I returned to Thailand and was trained for computer courses. After that I and my colleagues established the School of Computer Science in my university.
Familiarity
Question: It seems you are familiar with ICT and have been working in this field for a long time.
Answer: Yes, I have always used ICT. Even now I am still a chairman, a committee member, and advisor for student Master theses. When my students hand in the assignments, they will send them by email because we have to teach them about ICT so we have to know and use it too.

ICT Facilities
Question: You use the Internet and other ICT facilities as well, don't you?
Answer: Yes I do.

Difficulties in Learning ICT
Question: What difficulties do you experience when you use ICT?
Answer: The problems are, first, the hardware is not updated. The updated ones are too expensive for us. The capacity of the computer is not good enough, the software licenses are not cheap, and maintenance costs are high. Secondly, the problems belong to users for they have different skill levels.

Learning ICT
Question: Have you ever organized training courses for ICT?
Answer: I do them regularly.
Question: Are you the trainer?
Answer: Yes, I am. Sometimes we invite lecturers from other sources.

Appropriate Ways to Learn ICT
Question: If there is a researcher who would like to develop training aids or training workshop in order to learn the use of ICT, do you think it is a good idea?
Answer: In my opinion, we have to look at the goals and see what they want to learn ICT for? Whenever the learners have goals and know what to learn, it will be a success. If not, they may be interested only at the beginning but after that they will become bored and not understand and not want
to learn any more. If we train people who are really interested, they will be likely to learn and become familiar with ICT. To sum up, the goals of the learners are important.

Question: Up to date, have you ever provided workshop training?
Answer: Yes

Question: How was it? Was a workshop by a lecturer in front of the class or a workshop for a small group of people with one tutor in each group, or anything else?
Answer: Normally, we set up a workshop with around 25-30 persons with one lecturer and 1-2 mentors.

Question: Have you ever provided CAI for them? Is it possible to use CAI to do this?
Answer: It is hard because of several factors. For example, some people don't know how to operate the computer. If we provide them with CAI, it will be very difficult for them.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?
Answer: We have to focus on the skills of the learners and their goals to use ICT. We still have to train them than let them learn from CAI alone. Sometimes we give them CAI but they never turn it on because they don't understand or have no time, so it is useless. Therefore, the thing we have to do is to make them understand how to use and the exact significance of using ICT. If we train them, we must know how to encourage them to use it.

Question: So self learning is still difficult for them, is it?
Answer: Self learning, the learners must have goals first. If we just give them CAI, they may not be interested. Like a student, the teacher must detail the objectives of learning for them, and then students will study.
Interviewee G: a former university lecturer, 60 years old, Female

Personal details

Work status
Question: According to your information, you have already retired however, you still are working.
Answer: Yes, I still teach at the university.

Work details
Question: Is your job similar to the jobs you had done before you retired?
Answer: After retiring, I have been a part time lecturer and Masters degree's advisor and also write academic textbooks.

Motivation
Question: What motivates you to work even though you are already retired?
Answer: I would like to provide knowledge from my experiences for all of my students. Now I am doing just that.

ICT Facilities
Question: Are there any ICT facilities where you work, and do you use them?
Answer: There is no direct ICT for my job, however, ICT supports educators to help them reach goals. For example, PowerPoint.

Familiarity
Question: Do you use PowerPoint regularly?
Answer: Yes, I do. I use it when I teach and all of my students also use it when they have presentations in my class. They can use it very well. The other technology besides PowerPoint we use is the e-Learning system to report and submit students' grades to the university. All lecturers have to do this. It is a rule of the school.

Question: That means all lecturers in your university have to use ICT?
Answer: It is compulsory.

Question: What about searching the information on the Internet?
Answer: Yes, I have used it. There is a lot new information on the Internet that I can use to reference my teaching.
Learning ICT

Question: It seems you are familiar with ICT. May I ask, how did you learn it?
Answer: I attended training courses at my university. The technology just came when we are old and about to retire. If we still have to work, why we not learn how to use it? We have to concentrate. I think 90% of the staff in my university need to know how to use it.

Question: How are people trained?
Answer: Sometimes they invite other lecturers from outside even though we already have our own computer lecturers. There are about 30-40 persons in one class but numerous mentors to help us. The training courses have many levels, beginning from the basic level which has lots of students who have no skills or cannot operate the computer in the class and advanced levels where the classes are smaller. In the beginning classes may be larger.

Appropriate ways to learn ICT

Question: Do you think it is good to use CAI to help senior educators use ICT?
Answer: CAI is actually needed. Learning from CAI is not old fashioned it is especially useful for older people who live faraway from the city and find it inconvenient to travel. Therefore CAI is still important in my view.

Question: If there is a researcher who would like to develop training aids such as CAI to learn the use of ICT, do you think this is a good idea?
Answer: I strongly agree with this, especially for senior educators because we find that these groups of people still need to learn by themselves and it is sometimes not convenient to travel.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?
Answer: The researcher should consider that learners have many levels so the tools or teaching aids or training courses should be based at the level of the learners.
Interviewee H: a former university lecturer, Asst Prof, 62 years old, Male

Personal details

Work status
Question: First of all, thank you very much for answering the questionnaire survey for me. Would you please let me interview you in more detail today? From your feedback, I know that you have already retired, however, you are still working in the academic field, aren't you?
Answer: Yes, I do but only 1 day a week. Um, I also am an advisor for a factory.

Work details
Question: Is your job similar to the jobs you did before retiring?
Answer: Not at all, but some things are similar. I apply my knowledge and experience to work for the factory.

Motivations
Question: What motivates you to work even though you are already retired?
Answer: Umm it so happens that is convenient. Everything is there so I like to work. I am a person who wants to teach because when I teach somebody else, I also practice and gain knowledge too. Another thing is, I am thinking of my students. I would like to provide them with knowledge. That is what I want to do.

ICT Facilities
Question: Are there any ICT facilities where you work and do you use them to support your goals?
Answer: Very much! I mean, there are lots but as I have told you, I am very bad at using these things even though I know they are very important and very necessary and that I should adapt myself to learning about them.

Question: Have you ever used any computer programs to support your work? For example, PowerPoint.
Answer: I have never used it because I do not have many classes. When I teach I provide documents paper and worksheets for my students and
sometime use a pen to draw the structure of chemical formula on the overhead transparency. I am not sure if PowerPoint can do this thing or not.

**Familiarly**

**Question:** In your opinion, to help these people become familiar with ICT, what method would you suggest? For example, setting up workshop training programmes, preparing instructional books, using CAI or e-Learning.

**Answer:** I think we should use several methods. To use only one method may not be successful. Anyway, the other thing is how to make it convenient for them.

**Other ICT**

**Question:** Do you still use a computer or the Internet?

**Answer:** This is my problem. I am too old but I think I would like to try. Actually I intend to try because it is necessary and I should know about them.

**Using ICT**

**Question:** In your university do most lecturers use ICT in their academic work?

**Answer:** Yes. They often use PowerPoint presentations because it is very convenient. It can be taken anywhere to the country and abroad. Many new lecturers have been using it.

**Appropriate ways to learn ICT**

**Question:** In your university do they provide any training courses on ICT such as computer training programs or not?

**Answer:** Yes, there is a section to organize this. The training course is still important.

**Question:** What is the course like?

**Answer:** There is training by a lecturer in the class and there are tutors helping too. They provide one student per computer because we have lots of computers in our university.

**Question:** Do they use ICT in long distant learning?
Question: If researchers or course developers investigate ICT training aids or training course to assist senior educators become familiar with the use of ICT, what do you think this is a good idea?

Answer: Very good. I strongly agree with this because many senior educators who are already retired or are not yet retired still work or still have academic goals and no chance to use this particular technology. For me, I think it is very important for people who still want to be in academic fields.

Other suggestions

Question: Finally, do you have any suggestions for the researcher about this particular issue?

Answer: Remember senior educators will use ICT whenever

1. They feel it is convenient
2. They have time
3. When they have an advisor.
APPENDIX G

Information letter to participant for In-depth interview (Thai version)
For all queries, please contact:
Research Ethics Officer
Edith Cowan University
100 Joondalup Drive
JOONDALUP WA 6027
Phone: 6304 2170
Fax: 6304 2061
Email: research.ethics@ecu.edu.au

Human Research Ethics Committee

Dear [Name],

We are writing to inform you that your application for research ethics approval has been granted. Please note that this approval is valid for the period [date range].

1. Approval has been granted for the following research activities:

   [List of research activities]

2. This approval is subject to the following conditions:

   [List of conditions]

3. You are required to provide the following documentation:

   [List of documentation]

4. You are also required to notify us of any changes in the research plan.

   [List of changes to be notified]

Please ensure that all necessary procedures are followed and that all ethical considerations are maintained. If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

[Your Name]

Research Ethics Officer

---

Regarding the study conducted by [University Name], it is important to note that all ethical guidelines and regulations have been followed. The study was conducted in accordance with the Declaration of Helsinki.

On behalf of the Ethics Committee, we would like to thank you for your cooperation and commitment to ethical research practices.

Sincerely,

[Name]

[Position]

School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia

[Contact Information]

---

[Additional information or references]

[Signature]

Research Ethics Committee

---

[Date]

---

[Name]

[Position]

School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia

[Contact Information]

---

[Additional information or references]

[Signature]

Research Ethics Committee

---

[Date]
คู่มือการใช้งาน

ในฐานะนักศึกษาสาขาวิชาเทคโนโลยีสารสนเทศและการสื่อสาร มหาวิทยาลัย Edith Cowan ประเทศออสเตรเลีย เราได้พบว่าเยี่ยมชมวิทยาลัย และมีการสนทนากับอาจารย์ในเรื่องนี้ จนวันนี้นี้จะ
สิ่งที่สำคัญในการใช้เทคโนโลยีสารสนเทศและการสื่อสาร คือการสร้างความสัมพันธ์ทางเทคโนโลยี เพื่อการ
พัฒนาสังคมของผู้คนอีกอันหนึ่ง ได้ยินเห็นเป็นปัญหาเป็นนักวิชาการ เป็นแนวในการทำงานวิจัย และเป็นแนว
ที่ทำให้มีการทบทวนของงานวิจัยดังนี้

1. เพื่อให้การเตรียมความพร้อมในการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อให้บรรลุเป้าหมายเป็น
นักวิชาการของประเทศออสเตรเลีย

2. เพื่อให้การเตรียมความพร้อมในการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อให้บรรลุเป้าหมายเป็น
นักวิชาการของประเทศออสเตรเลีย

3. เพื่อให้การเตรียมความพร้อมในการใช้เทคโนโลยีสารสนเทศและการสื่อสารที่มีให้ความหมายถึง
นักวิชาการของประเทศออสเตรเลีย

4. เพื่อให้การเตรียมความพร้อมในการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อให้บรรลุเป้าหมายเป็น
นักวิชาการของประเทศออสเตรเลีย

5. เพื่อให้การเตรียมความพร้อมในการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อให้บรรลุเป้าหมายเป็น
นักวิชาการของประเทศออสเตรเลีย

วิวัฒนาการและพัฒนาการในการศึกษาเรียนรู้การใช้เทคโนโลยีสารสนเทศของประเทศออสเตรเลีย ซึ่งกับระยะเวลาใน
หนึ่งนี้ถือเป็นอีกหนึ่งในมิติของระยะเวลาที่มีการพัฒนาการที่หลากหลาย ซึ่งจากผลลัพธ์
จากการวิเคราะห์ผ่านเสนอหนังสือเรียน แล้ว กระแสจะได้คิดค้นโดยสิ่งแวดล้อมสำหรับที่จะรับรู้ได้ใน
สิ่งแวดล้อมซึ่งเป็นข้อเสนอแนะที่เป็นไปได้ อย่างไรก็ตามจะเกิดขึ้นที่ท่าทีที่สามารถทำให้
สิ่งแวดล้อมตั้งคำถามในความมากว่านั้น ได้แก่เรื่องที่เหมาะสมกันและทำให้ได้สิ่งแวดล้อมและความ
ที่เกี่ยวข้องต่อไป

การวิจัยดังนี้จะเป็นประโยชน์อย่างยิ่งต่อการศึกษาของประเทศ และกลุ่มประเทศออสเตรเลีย
ประเทศออสเตรเลีย โดยทุกอย่างจะได้รับผลกระทบที่มากไป atas การศึกษาและวิจัยที่จะสามารถช่วย
ให้บรรลุเป้าหมายทางศึกษาและวิจัยในสมัยนี้อย่างมีประสิทธิภาพ ดังนั้นการวิจัยนี้จึงขับเคลื่อน
นักวิจัยสู่การเรียนรู้ ให้เกิดการตอบสนองต่อคำถามในการใช้เทคโนโลยีสารสนเทศและการสื่อสารที่เหมาะสม
เพื่อการสร้างหลักฐานให้ผู้ศึกษาการใช้เทคโนโลยีสารสนเทศและการสื่อสาร การวิจัยนี้จะสามารถเป็น
เทคโนโลยีใหม่ที่จะใช้ร่วมกับความมั่นคง รวมถึงการประสานงานที่มีอยู่อีกอย่างที่ท่าทีที่จะพัฒนา
งานต่อไป และสิ่งที่เกิดขึ้นนี้จะทำให้สามารถวิจัยได้ก็ว่า สามารถวิจัยได้กันในเทคโนโลยี
знันใหม่ โดยที่ไม่สู่สิ่งที่ควบคุมการเรียนรู้ในสมัยนี้ หลักการวิจัยที่น่าสนใจนี้ คือการจะเป็น
ประชาบุรีเป็นอุตสาหกรรมก่อตัวกระดับทางวิทยาศาสตร์ และกลุ่มบุคคลที่มีการคาดการณ์และ
ประสิทธิภูมิต่อย่างทุกปัญหา ทั้งในประเทศที่พัฒนาแล้วและการที่เกิดขึ้นในประเทศไทย.
Research Ethics Officer
Human Research Ethics Officer
Edith Cowan University
100 Joondalup Drive
JOONDALUP WA6027
Phone: (08) 6304 2170 Email: research.ethics@ecu.edu.au
APPENDIX H

Information letter to participants (English version)
Information Letter to Participants

Title of the thesis: An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand

Researcher and Contact details

This thesis is being undertaken as part of the requirements of a Doctor of Information Technology at Edith Cowan University.

The researcher: Mr. Nattavee Uatkrit
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia
Personal telephone: [Redacted]
E-mail address: nuakrit@student.ecu.edu.au

Sources of funding

Funding for this research is being provided by the researcher who will arrange everything so that no cost will be incurred by the participants.

Description of the thesis

As a Doctor of Information Technology student at Edith Cowan University, Western Australia, I would appreciate your support in this study. This research will concentrate on how senior Thai educators use ICT to attain their goals: professional goals and goals in their academic life. The purpose of this research is:

1. To explore your beliefs in using ICT for your professional goals.
2. To explore your attitudes in using ICT to achieve your professional goals.
3. To explore the level of your needs of ICT in your academic life.
4. To explore what ICTs are suitable to support your goals.
5. To investigate and recommend the best way of learning how to use appropriate ICT in your life.

The study aims to investigate how Thai senior educators utilise ICT to support their needs. In-depth information will be collected from this particular group to answer the research questions. The sample will include only Thai senior educators living in Bangkok and its surroundings.
A good response will help to gain a comprehensive picture of the study so I would appreciate your support in completing the enclosed questionnaire and participating in the In-dept Interview. The questionnaires will take approximately 30 minutes to complete. Respondents who have provided meaningful comments, interesting data and a range of opinions will be selected for an in-depth interview after the questionnaire has been analysed. Please be assured that your data will be kept strictly confidential and used only for this study and there are no risks to participation beyond those encountered in everyday life.

The results of the research will be useful both for researchers and senior Thai educators to understand what ICT topics can enable them to reach their goals. It will also assist course developers to design and conduct appropriate ICT training that will assist senior academics. Once they are familiar with ICT, they will become confident in applying their new knowledge in their work. This will be of great value to them, will help them not to feel out-of-date, and permit them to have an easier life in modern society. Another significant outcome of this research is that it may also be of international importance to groups of senior people in both developing and developed countries where there are similar environments and factors.

If you would like to participate in this research project, please sign the Informed Consent Document attached to this letter, complete the questionnaire and return them in the enclosed stamp-addressed enveloped.

Data collection involving audiovisual recording
Tape-recordings will be used to gather further information during interviews and will be wiped clean after the study is completed.

Confidentiality of information
- The names and addresses of respondents will be coded on the questionnaire which will be retained for contacting respondents for in-depth interviews.
- Documentary records will be stored in a locked filing cabinet at the School of Computer and Information Science-Edith Cowan University and under similar conditions in my house in Thailand. I will be the only person with a key to each of these sites.
- The data on the computer in ECU and on my laptop will be protected by a password known only to me.
- The documents will be shredded and tapes of interviews wiped clean

Results of the study
The data and information from your comments will be used to complete a Doctoral student thesis. The results of the study will not be made available to any third party or used in any published material without your prior consent.

Voluntary participation
Your participation in this study is completely voluntary. You may decline altogether, or leave blank any questions you do not wish to answer.
Withdrawing consent to participate

You may withdraw from involvement in the project at any time but a written
letter of withdrawal should be forwarded to the researcher.

Questions and/or further information

If you have any questions about this study, please feel free to contact the
researcher at contact address at the beginning of this letter.

Independent contact person

If you have any concerns or complaints about the research project and wish to
talk to an independent person, you may contact:

Research Ethics Officer
Human Research Ethics Officer
Edith Cowan University
100 Joondalup Drive
JOONDALUP WA 6027
Ph.: (08) 6304 2170
Email: research.ethics@ecu.edu.au
APPENDIX I

Informed consent document to participants
Informed Consent Document

Title of the thesis
An Investigation into the use of Information and Communication Technology (ICT) by senior educators in Thailand

Researcher and Contact details

This thesis is being undertaken as part of the requirements of a Doctor of Information Technology at Edith Cowan University.

The researcher: Mr. Nattavee Utakrit
Contact address: School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia
Personal telephone: 
E-mail address: muakrit@student.ecu.edu.au

Consent for audiovisual recording
Tape-recordings will be used to gather further information from the interviewees in the Interview and will be wiped clean after the study is completed.

Consent for the use of data and/or samples collected
The data and information from your comments will be used to complete a Doctoral student thesis. The results of the study will not be made available to any third party or used in any published material without your prior consent.
Statement indicating consent to participate

To potential participants, I .............................................................

- have read and understand the Information Letter.
- have been given the opportunity to ask questions and have had any questions answered to my satisfaction.
- am aware that if I have any additional questions, I can contact the research team.
- understand that the information provided will be kept confidential, and that the identity of participants will not be disclosed without consent.
- understand that the information provided will only be used for the purposes of this research project.
- understand I am free to withdraw from further participation at any time, without explanation or penalty.
- freely agree to participate in the project.

Participant or authorized representative .................................. Date

Investigator .................................................................................. Date
APPENDIX J

Informed consent document to participants (Thai version)
หน้าสื่อให้ความเป็นธรรมร่วมแสดงผลสอบถามเพื่อการรับรู้
(ปิดรับสมัครและแสดงผลสอบถามวันที่ 29 กรกฎาคม 2548)

หัวข้องานวิจัย: การศึกษาเกี่ยวกับการใช้เทคโนโลยีสารสนเทศกระแสฟังสบายของเรารายการใด
ในครูวิทยาศาสตร์ของประเทศไทย

ชื่อวิธีการและสถานที่ศึกษา:
งานวิจัยนี้เกี่ยวกับการผู้ใช้เทคโนโลยีเป็นส่วนหนึ่งของการศึกษาหลักสูตรการพัฒนาการศึกษา
ทางเทคโนโลยีสารสนเทศและการศึกษา คณะครุศาสตร์ Edith Cowan ประเทศออสเตรเลีย

ชื่อวิจัย:

นางมณี ฤทธิ์กัน

ที่อยู่:
School of Computer and Information Science, Faculty of Communications, Health and Science, Edith Cowan University, Mt. Lawley Campus, Western Australia

โทรศัพท์:

อีเมล์:

mutakrit@student.ecu.edu.au

การจัดทำไม่ใช้อกบุคคล

ขอรับการรับรองผลการเก็บข้อมูลของแต่ละแหล่งที่ได้ตกลงที่จะทำ ไม่ใช้เพื่อเป็นส่วนหนึ่งในการตัดสินใจเพื่อประโยชน์ของข้อมูลทางวิชาการ
หรือการพัฒนาการวิจัยในระบบบริการสุขภาพไทย การจัดทำข้อมูลจะปฏิบัติตามที่ได้รับอนุญาตต่อไปนั้นโดยไม่ละเมิด
ทางจริยธรรมในการได้รับข้อมูลจากผู้ตอบ เพื่อที่จะให้ถูกต้องตามจริยธรรมการวิจัยทางวิชาการและจริยธรรม
คำอธิบายตามตัวแบบตอบameleon / ให้ความหมาย

ชื่อวิทยากร / คู่มือในชั้น

รายการไว้ไว้โดย (............................................................)

- ได้ยิน แสบ ร่วมภาพเข้าใจอย่างเดียวจากภาพแบบสอบถามและวิเคราะห์การตอบแบบสอบถาม
- ได้รับโอกาสที่จะตอบคำถาม เรียบร้อยไว้เป็นหลักฐาน และตรวจสอบการตัดสินใจ
- หยุดการตอบแบบสอบถามพิเศษที่มีการค้นหาจากผู้ให้บริการ
- ร่างสร้างข้อความเพื่อค้นหาข้อมูลในแบบสอบถาม หรือจัดทำเครื่องหมาย
- ร่างสร้างข้อความเพื่อค้นหาจากผู้ให้บริการ และตรวจสอบข้อมูล ได้หากมีการตัดสินใจ
- ร่างสร้างข้อความเพื่อค้นหาจัดทำข้อความข้อมูลในแบบสอบถาม
- ร่างสร้างข้อความเพื่อค้นหาจากผู้ให้บริการ และตรวจสอบข้อมูล
- ร่างสร้างข้อความเพื่อค้นหาจัดทำข้อความในแบบสอบถาม ได้หากมีการตัดสินใจ
- ร่างสร้างข้อความเพื่อค้นหาจากผู้ให้บริการ และตรวจสอบข้อมูล
- ร่างสร้างข้อความเพื่อค้นหาจัดทำข้อความในแบบสอบถาม ได้หากมีการตัดสินใจ

ชื่อผู้แจ้งติดต่อ.......................................... / เลขที่.............

ชื่อผู้ตรวจ / ผู้ประสาน................................... / เลขที่.............