EFFECTS OF IN-SERVICE COMPUTER TRAINING COURSES ON TEACHERS' COMPUTER LITERACY, ATTITUDES TOWARD COMPUTERS, FREQUENCY OF USE AND CONFIDENCE IN INTEGRATING COMPUTERS IN THE TEACHING-LEARNING PROCESS

Yong Chee Kieng
UNIVERSITI MALAYSIA SARAWAK

BORANG PENGESAHAN STATUS TESIS


SESI PENGAJIAN : 2009

Saya YONG CHEE KIN NG (HURUF BESAR) mengaku membenarkan tesis ini disimpan di Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dengan syarat-syarat kegunaan seperti berikut:

1. Tesis adalah hak milik Universiti Malaysia Sarawak
2. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan untuk tujuan pengajian sahaja
3. Membuat pendigitaran untuk membangunkan Pangkalan Data Kandungan Tempatan
4. Pusat Khidmat Maklumat Akademik, Universiti Malaysia Sarawak dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi
5. **silakan tandaskan (✓)**

☐ SULIT (mengandungi maklumat yang berdampak kepada keselamatan atau kepentingan seperti termaktub di dalam AKTA RAHSIA RASMI 1972)

☐ TERHAD (Mengandungi maklumat Terhad yang telah ditentukan oleh organisasi/ badan di mana penyelidikan dilaksanakan)

✓ TIDAK TERHAD

Disahkan oleh

(TANDATANGAN PENULIS) (TANDATANGAN PENYELIA)

Alamat Tetap:
2223, Heights Estate,
Jalan Serangoon R.8,
93810 Kuching.

Tariikh: 20/2/2009

Catatan: * Tesis dimaksudkan sebagai tesis bagi ijazah Doktor Falsafah, Sarjana dan Sarjana Muda
* Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh tesis ini perlu dikelaskan sebagai SULIT atau TERHAD
EFFECTS OF IN-SERVICE COMPUTER TRAINING COURSES ON TEACHERS' COMPUTER LITERACY, ATTITUDES TOWARD COMPUTERS, FREQUENCY OF USE AND CONFIDENCE IN INTEGRATING COMPUTERS IN THE TEACHING-LEARNING PROCESS

A Research Paper submitted in partial fulfillment of the Requirement for the Degree of Master of Science (Human Resource Development)

Faculty of Cognitive Science and Human Development
UNIVERSITI MALAYSIA SARAWAK
2009
ACKNOWLEDGEMENT

First of all, I would like to express my sincere appreciation to my project supervisor, Associate Professor Dr. Hong Kian Sam, for his continual advice, guidance, support and encouragement that always keep me on the right path in producing this research paper. My gratitudes to Dr. Shahren Ahmad Zaidi Adruce, Dean of the Faculty of Cognitive Sciences and Human Development, UNIMAS for his advice and support to me. My thanks to Dr. Sopian Bujang, Coordinator of Postgraduate Program for his continual encouragement and support in completing my project paper. My deepest appreciation to Dr. Rusli Ahmad for his comments and suggestions in completing the research paper. My sincere gratitudes to all my lecturers at Faculty of Cognitive Sciences and Human Development, and principals and sciences, Mathematics and Technical teachers of SMT Sejingkat, SMT Kuching and SMT Matang for participating in this research. Last but not least, I would like to dedicate this research paper to my dearest wife, my son, my parents and my family members who always supported me.
ABSTRACT

This research explored the effects of in-service computer training courses on teachers' computer literacy, attitudes toward computers, frequency of and confidence in integrating computer in PPSMTI. In addition, this study also looked at how demographic variables such as age, gender and prior computer experiences impacted on the four dependent variables, and the relationships among them. A total of 63 teachers that taught Sciences, Mathematics and Technical subjects from three technical secondary schools in Kuching participated in this study. The results indicated that attendance at in-service computer training courses could improve teachers' computer literacy, enhanced positive attitudes toward computers, increased frequency of using computer in the class and boosted confidence level in integrating computer in PPSMTI.

There were no differences in teachers' computer literacy, attitudes toward computers, frequency of and confidence in integrating computer in PPSMTI based on demographic variables such as age, gender and computer experience. The findings also showed that there were significant relationships between computer literacy, attitudes toward computers, frequency of and confidence in integrating computers. These findings were generally in line with those reported in the literatures past research that indicated improvement in skills and attitudes toward computers after teachers attended training on the use of computer and more frequent training resulted in increase confidence and use of computers in the teaching-learning process. Thus, for successful integration of computer into teaching-learning process, the relevant agencies need to ensure that not only teachers are provided with the necessary hardware and training on computer softwares, there must also be efforts to build teachers' confidence and positive attitudes toward computers.
Kajian ini meninjau kesan kursus dalam perkhidmatan yang berorientasikan komputer ke atas aras literasi komputer, sikap terhadap komputer, frekuensi and keyakinan guru-guru dalam mengintegrasikan komputer dalam proses pengajaran dan pembelajaran dalam PPSMTI. Di samping itu, kajian ini turut meninjau kesan pembolehubah demografi seperti umur, jantina dan pengalaman komputer sedia ada terhadap empat pembolehubah bersandar serta hubungan antara pembolehubah-pembolehubah tersebut. Reka bentuk kajian ini adalah kajian survei keratan-rentas dan borang soal selidik merupakan sumber utama untuk mengumpul data. Secara keseluruhan, terdapat 63 orang guru yang mengajar mata pelajaran sains, matematik and teknikal daripada 3 buah sekolah menengah teknik di Kuching yang terlibat dalam kajian ini. Hasil kajian ini menunjukkan bahawa kehadiran dalam kursus dalam perkhidmatan yang berorientasikan komputer mampu meningkatkan aras literasi komputer, menggalakkan sikap positif terhadap komputer, meningsikan frekuensi dan keyakinan guru-guru dalam mengintegrasikan komputer dalam proses pengajaran dan pembelajaran. Tidak ada perbezaan dalam aras literasi komputer, sikap terhadap komputer, frekuensi and keyakinan guru-guru dalam mengintegrasikan komputer berdasarkan pembolehubah demografi seperti umur, jantina dan pengalaman penggunaan komputer. Hasil kajian ini turut menunjukkan bahawa terdapat hubungan antara aras literasi komputer, sikap terhadap komputer, frekuensi and keyakinan guru-guru dalam mengintegrasikan komputer. Jadi, untuk mengintegrasikan komputer dalam proses pengajaran dan pembelajaran dengan berkesan, agensi-agensi berkanaan perlu memastikan terdapat usaha untuk meningkatkan keyakinan and sikap positif para guru selain membekalkan perkakasan komputer dan latihan kepada guru.
TABLE OF CONTENTS

Acknowledgement i
Abstract ii
Abstrak iii
Table of Contents iv
List of Tables ix
List of Figures xii

Chapter One: Introduction 27
1.0 Background of study 1
1.1 Statement of problem 3
1.2 Research objectives 5
1.3 Research questions 6
1.4 Research hypotheses 8
1.5 Research framework 9
1.6 Significance of the study 10
1.7 Limitation of the study 10
1.8 Definition of terms 11
1.9 Summary 12

iv
Chapter Two: Literature Review

2.0 Introduction

2.1 Computers and Education

2.2 In-service Computer Training

2.3 HRD Training Theories

2.4 Computer Literacy

2.5 Attitudes toward Computers

2.6 Computer Experience

2.7 Differences in Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in using Computer based on Demographic Variables.

2.8 Summary

Chapter Three: Methodology

3.0 Introduction

3.1 Research Design

3.2 Population & Sample

3.3 Research Instrument

3.4 Pilot Test

3.5 Data Collection Procedure

3.6 Data Analysis Procedure

3.7 Summary
Chapter Four: Findings

4.0 Introduction 45

4.1 Descriptive Statistics 45

4.2 Differences in teachers' Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer based on attendance at In-service Training Courses.

4.2.1 Were there any differences in computer literacy based on attendance at in-service training courses? 55

4.2.2 Were there any differences in attitudes toward computers based on attendance at in-service training courses? 56

4.2.3 Were there any differences in frequency of using computer based on attendance at in-service training courses? 57

4.2.4 Were there any differences in confidence in integrating computer based on attendance at in-service training courses? 58

4.3 Differences in teachers' Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer based on Demographic variables such as gender, age and computer experience.

4.3.1 Were there any differences in computer literacy based on demographic variables? 59

4.3.2 Were there any differences in Attitudes toward Computers based on demographic variables? 61

4.3.3 Were there any differences in Frequency of using Computer based on demographic variables? 63
4.3.4 Were there any differences in Confidence in Integrating Computer based on demographic variables?

4.4 Relationship between teachers’ Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer into Teaching-learning Process

4.4.1 Was there a relationship between computer literacy and attitudes toward computers?

4.4.2 Was there a relationship between computer literacy and frequency of using computer in the class?

4.4.3 Was there a relationship between computer literacy and confidence in integrating computer into teaching-learning process?

4.4.4 Was there a relationship between attitudes toward computers and frequency of using computer in the class?

4.4.5 Was there a relationship between attitudes toward computers and confidence in integrating computer into teaching-learning process?

4.4.6 Was there a relationship between frequency of using computer and confidence in integrating computer into teaching-learning process?

4.5 Summary

Chapter Five: Discussions and Conclusions

5.0 Introduction

5.1 Summary of the study

5.2 Discussion of findings
5.2.1 Differences in teachers' Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer based on attendance at In-service Training Courses.

5.2.2 Differences in teachers' Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer based on Demographic Variables.

5.2.3 Relationship between teachers' Computer Literacy, Attitudes toward Computers, Frequency of and Confidence in Integrating Computer into Teaching-learning Process

5.3 Recommendations

5.3.1 For Practice

5.3.2 For Future Research

5.4 Conclusion
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Era of Computer Advancement</td>
<td>24</td>
</tr>
<tr>
<td>3.1</td>
<td>Reliability analysis for the questionnaire</td>
<td>39</td>
</tr>
<tr>
<td>3.2</td>
<td>Distribution of Computer Literacy Scores and their respective levels</td>
<td>40</td>
</tr>
<tr>
<td>3.3</td>
<td>Distribution of Attitudes toward Computers Scores and their respective levels</td>
<td>41</td>
</tr>
<tr>
<td>3.4</td>
<td>Distribution of Frequency of Using Computer Scores and their respective Levels</td>
<td>42</td>
</tr>
<tr>
<td>3.5</td>
<td>Distribution of Confidence in Integrating Computer Scores and their respective Levels</td>
<td>42</td>
</tr>
<tr>
<td>3.6</td>
<td>Type of Statistical Analysis used for each research question</td>
<td>43</td>
</tr>
<tr>
<td>4.1</td>
<td>Descriptive Statistics for Participants' Background</td>
<td>45</td>
</tr>
<tr>
<td>4.2</td>
<td>Descriptive Statistics for Attendance at In-service Training</td>
<td>46</td>
</tr>
<tr>
<td>4.3</td>
<td>Computer Literacy Level</td>
<td>47</td>
</tr>
<tr>
<td>4.4</td>
<td>Distribution of Participants by Computer Literacy Levels</td>
<td>48</td>
</tr>
<tr>
<td>4.5</td>
<td>Attitudes toward Computers</td>
<td>49</td>
</tr>
<tr>
<td>4.6</td>
<td>Distribution of Participants by Attitudes toward Computers</td>
<td>51</td>
</tr>
<tr>
<td>4.7</td>
<td>Frequency of using Computer in Class</td>
<td>52</td>
</tr>
<tr>
<td>4.8</td>
<td>Distribution of Participants by Frequency of using Computer in the Class</td>
<td>53</td>
</tr>
<tr>
<td>4.9</td>
<td>Confidence in Integrating Computer into Teaching-learning Process</td>
<td>54</td>
</tr>
<tr>
<td>Table 4.10</td>
<td>Distribution of Participants by Confidence in Integrating Computer</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Table 4.11</td>
<td>Differences in teachers' computer literacy based on attendance at in-service training</td>
<td></td>
</tr>
<tr>
<td>Table 4.12</td>
<td>Differences in teachers' attitudes toward computers based on attendance at in-service training</td>
<td></td>
</tr>
<tr>
<td>Table 4.13</td>
<td>Differences in teachers' frequency of using computer based on attendance at in-service training</td>
<td></td>
</tr>
<tr>
<td>Table 4.14</td>
<td>Differences in teachers' confidence in using computer based on attendance at in-service training</td>
<td></td>
</tr>
<tr>
<td>Table 4.15</td>
<td>Differences in teachers' computer literacy level based on Gender</td>
<td></td>
</tr>
<tr>
<td>Table 4.16</td>
<td>Differences in teachers' computer literacy level based on age</td>
<td></td>
</tr>
<tr>
<td>Table 4.17</td>
<td>Differences in teachers' computer literacy level based on computer experience</td>
<td></td>
</tr>
<tr>
<td>Table 4.18</td>
<td>Differences in teachers' attitudes toward computers based on Gender</td>
<td></td>
</tr>
<tr>
<td>Table 4.19</td>
<td>Differences in teachers' attitudes toward computers based on age</td>
<td></td>
</tr>
<tr>
<td>Table 4.20</td>
<td>Differences in teachers' attitudes toward computers based on computer experience</td>
<td></td>
</tr>
<tr>
<td>Table 4.21</td>
<td>Difference in teachers' frequency of using computer based on Gender</td>
<td></td>
</tr>
<tr>
<td>Table 4.22</td>
<td>Differences in teachers' frequency of using computer based on age</td>
<td></td>
</tr>
<tr>
<td>Table 4.23</td>
<td>Differences in teachers' frequency of using computer based on computer experience</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.24 Differences in teachers' confidence in integrating computer based on Gender

Table 4.25 Differences in teachers' confidence in integrating computer based on age

Table 4.26 Differences in teachers' confidence in integrating computer based on computer experience
LIST OF FIGURES

INTRODUCTION

Figure 1.1 Research framework 9
Figure 2.1 Holton's transfer of training model 17

Malaysian government is placing a lot of emphasis on promoting technical education in the public and private institutions since the second Outline Perspective Plan (OPP2) 1981-2000 and advocated such as upgrading all vocational secondary schools to technical secondary schools in 1997 (Shahiril Mazuki, Zamri Ishak, Lee, & Suadah Hj. Noor, 1998). With this, it is hoped that technical education institutions are able to supply a pool of trained, skilled and knowledgeable manpower that is multi-talented, willing to learn continuously and also have the ability to acquire and apply knowledge particularly in sciences technology which will contribute to Malaysia becoming a developed nation (Technical Education Department, 2005).

Technical education was first introduced in Malaysia in 1960's by the Ministry of Education (Gudang Hikam, 1961). One of the aims of technical education was to fulfill the country's need for skilled workers. Thus, technical institutions such as technical schools were established all over the country to serve as the main contributor of semi-skilled and skilled workers for the nation present and future needs (Technical Education Department, 2005).

In 2002, the Ministry of Education had introduced a program called PPSMI (Pengajaran dan Pembelajaran sains dan matematik dalam bahasa Inggeris) to all the primary and secondary school in Malaysia (Ministry of Education, 2008). Under
CHAPTER ONE
INTRODUCTION

1.0 Background of study

Malaysian government is placing a lot of emphasis on promoting technical education in the public and private institutions since the second Outline Perspective Plan (OPP2) 1991-2000 was introduced such as upgrading all vocational secondary schools to technical secondary schools in 1997 (Shahril Marzuki, Zainun Ishak, Lee, & Saedah Hj. Siraj, 1993). With this, it is hoped that technical education institutions are able to supply a pool of trained, multi-skilled and knowledgeable manpower that is multitalented, willing to learn continuously and also have the ability to acquire and apply knowledge particularly in modern technology which will contribute toward Malaysia becoming a developed nation (Technical Education Department, 2005).

Technical education was first introduced in Malaysia in 1960's by the Ministry of Education (Sufean Hussin, 1993). One of the aims of technical education was to fulfill the country’s need for skilled workers. Thus, technical institutions such as technical schools were introduced throughout the country to serve as the main contributor of semi-skilled and skilled workers for the nation present and future needs (Technical Education Department, 2005).

In 2002, the Ministry of Education had introduced a program called PPSMI (Pengajaran dan Pembelajaran mata pelajaran sains dan matematik dalam bahasa Inggeris) to all the primary and secondary school in Malaysia (Ministry of Education, 2008). Under
PPSMI starting from 2003, all students in primary one, form one and lower six will learn science and mathematics in English. For technical school, this program is named PPSMTI (Pengajajaran dan Pembelajaran mata pelajaran sains, matematik dan teknikal dalam bahasa Inggeris) because not only science and mathematics are taught in English but technical subjects are also taught in English (Ministry of Education, 2008).

With the implementation of the PPSMTI program, all the schools involved were given laptop computers, LCD projectors and also teaching courseware (Ministry of Education, 2008). With the provision of technological tools, teachers are urged to integrate the use computer into the teaching and learning process so that students can learn faster, better, more effectively and in a more interesting environment (Wachholz, Meleisea & Apikul, 2005).

A direct implication of the implementation of PPSMTI is the need to change the traditional teacher-centered classroom teaching and learning style to a more interactive and student-centered teaching and learning environment (Trucano, 2005). However, some teachers may found it easy to integrate the use of computer into their teaching activities while others may face problems to do so due to differences in computer literacy levels and other factors such as age, gender and computer experience.

According to Gurcan-Namlu (2003), it is teachers who determined whether the use of technology in the class will be useful and efficient. Teachers have to be capable in using the technology; otherwise, despite having all the facilities, they may still be not able to integrate technology into teaching and learning (Gurcan-Namlu, 2003).
1.1 Statement of the problem

Integration of computer into the teaching and learning process in Malaysia is not a recent phenomenon. In 1997, the Ministry of Education launched a project called the Smart School project as one of the seven flagship applications of the Multimedia Super Corridor. Under this project, 90 schools were selected as pilot smart schools and these schools were advised to integrate the use of computer and other related information and communication technologies into the teaching and learning process (Ministry of Education, 1997).

According to Malaysian Budget 2003, the government has allocated nearly 5 billion ringgit for a period of seven years from 2002 to 2008 for PPSMI project (Ministry of Finance, 2002). A large portion of this allocation was for training of teachers, providing a launching grant for schools as well as teaching and educational aids, apart from providing basic facilities and physical infrastructure, especially for ICT. To ensure that the PPSMTI program would be implemented effectively, teachers were supplied with notebook computers, LCD projectors and other related equipment (Ministry of Finance, 2002).

Integrating computer into the teaching and learning process is not simply transferring the notes from the blackboard to the computerized slide shows. It has to be more than importing animations, sounds, movies, and other visual effects into the learning process. These multimedia elements must be able to make an abstract concept easily understood by students and make a complex fact and dull text looked simple and interesting (Wachholz, Meleisea & Apikul, 2005).
Past research have showed that positive attitudes toward computers are positively correlated with teachers' extent of experience with computer technology. Positive teachers' attitudes toward computer are widely recognized as a necessary condition for effective use of ICT in the classroom (Woodrow, 1992). Furthermore, Violato, Mariniz and Hunter (1989) identified teachers' attitudes and expertise in using computer as another major factor in the adoption of computers in the classroom. It is critical that teachers possess both positive attitudes and adequate computer literacy skills to successfully incorporate technology into the classroom.

For example, Usun (2007) stated that in order to use computer in education effectively, teachers must have at the very least minimal expertise in computer education. Usun (2007) further elaborated that this appropriate level of expertise may come from formal in-service or pre-service teacher training.

Thus, it is essential to determine whether the in-service training for PPSMTI provided by the Ministry of Education improved teachers' computer literacy level, enhanced positive attitudes toward computer, increased frequency of using computer and boosted teachers' confidence level for integrating computer in the teaching-learning process.
1.2 Research objectives

The main aims of this study were to investigate the differences in teachers' computer literacy level, attitudes toward computers, frequency of using computer in the classroom and teachers' confidence in integrating computer in the teaching-learning process based on attendance at in-service computer training courses for PPSMTI. In addition, this study also examined if there were differences in teachers' computer literacy, attitudes toward computer, frequency of using computer in the classroom and confidence in using computer based on demographic variables such as age, gender and computer experience. Finally, this study explored the relationships between computer literacy, attitudes toward computer, frequency of using computer in the classroom and confidence in integrating computer in the teaching-learning process.

Specifically the following were the research objectives of the study.

i) To determine the differences in teachers’
   - computer literacy level,
   - attitudes toward computers,
   - frequency of using computer in the classroom, and
   - confidence in integrating computer in the teaching-learning process
   based on attendance at in-service training courses.

ii) To determine differences in teachers’
    - computer literacy level,
    - attitudes toward computers,
    - frequency of using computer in the classroom, and
    - confidence in integrating computer in the teaching-learning process

based on demographic variables such as age, gender and computer experience.

iii) To determine the relationships between

- computer literacy and attitudes toward computers,
- computer literacy and frequency of using computer in the classroom,
- computer literacy and confidence in integrating computer into teaching-learning process,
- attitudes toward computers and frequency of using computer in the classroom,
- attitudes toward computers and confidence in integrating computer in the teaching-learning process, and
- frequency of using computer in the classroom and confidence in integrating computer in the teaching-learning process

1.3 Research questions

i) Were there any significant differences in teachers' 

- computer literacy level,
- attitudes toward computers,
- frequency of using computer in the classroom, and
- confidence in integrating computer in the teaching-learning process

based on attendance at in-service training courses?
ii) Were there any significant differences in teachers’

- computer literacy level,
- attitudes toward computers,
- frequency of using computer in the classroom, and
- confidence in integrating computer in the teaching-learning process

based on demographic variables such as age, gender and computer experience?

iii) Were there a significant relationships between

- computer literacy and attitudes toward computers?
- computer literacy and frequency of using computer in the classroom?
- computer literacy and confidence in integrating computer into teaching-learning process?
- attitudes toward computers and frequency of using computer in the classroom?
- attitudes toward computers and confidence in integrating computer in the teaching-learning process?
- frequency of using computer in the classroom and confidence in integrating computer in the teaching-learning process?
1.4 Research hypotheses

H01: There were no significant differences in teachers' computer literacy level, attitudes toward computers, frequency of using computer in the classroom, and confidence in integrating computer in the teaching-learning process based on attendance at in-service training courses.

H02: There were no significant differences in teachers' computer literacy level, attitudes toward computers, frequency of using computer in the classroom, and confidence in integrating computer in the teaching-learning process based on demographic variables such as age, gender and computer experience.

H03: There were no significant relationships between computer literacy and attitudes toward computers, computer literacy and frequency of using computer in the classroom, computer literacy and confidence in integrating computer into teaching-learning process, attitudes toward computers and frequency of using computer in the classroom, attitudes toward computers and confidence in integrating computer in the teaching-learning process.
• frequency of using computer in the classroom and confidence in integrating computer in the teaching-learning process.

1.5 Research framework

Figure 1.1 shows the research framework indicating the independent variables and dependent variables used in the present study.

**Independent Variables**

- Attendance at In-service Training Courses
- Demographic Variables: Age, Gender, Computer Experience

**Dependent Variable**

- Computer Literacy Level
- Attitudes toward Computers
- Frequency of Integrating Computer in Class
- Confidence level of Integrating Computer in Class

Figure 1.1 Research framework