Factors Affecting Information and Communication Technology (ICT) Integration in Jordanian Secondary Schools

A Thesis Submitted to the College of Arts and Science
In fulfillment of the requirements for
The Degree of Doctor of Philosophy
Universiti Utara Malaysia

By:

Yousef Ahmad Al-Jaraideh
(Matric No.: 90686)

June, 2009
PERMISSION TO USE

In presenting this thesis in fulfillment of the requirement for the degree of Doctor of Philosophy from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisors, Assoc. Prof. Dr. Ahmad Jelani and Assoc. Prof. Dr. Malek, or in their absence, by the Assistant Vice-Chancellor of College of Arts and Science. It is also understood that any copying or publication or use of this thesis or part thereof for financial gain shall not be allowed without any written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from this thesis.

Request for permission to copy or to make other use of material in this thesis, in whole or in part, should be addressed to:

Assistant Vice-Chancellor College of Science and Arts
University Utara Malaysia
06010 Sintok
Kedah Darul Aman
MALAYSIA
ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and Most Merciful. Praise be given to Him and peace be upon His beloved Prophet Muhammad (SAW).

First, one has to recognize that there is no ease in our deeds except only one that Allah made it easy, so I pray for Allah to change all difficulties into easy. I thank Allah who made my study journey easier than it was expected.

I dedicate my humble work to my mothers' soul, whose spirit was the energy that pushed me to achieve my thesis, as well as alleviated the hardship of overseas. To her I would like to say that "I love you mama".

Nevertheless, I would like to address my great appreciations to many people for their contribution in participating to make this work successful. Firstly I would like to thank my supervisors Associate Professor Dr Ahmad Jelani, and Associate Professor Dr Abudlimalek for their patience, kindness, guidance and unaccountable hours they spent with me to make this thesis seeing the light. From my heart, I appreciate both of you, as well as you were considered as my parents and friends during my study journey. Your critical thinking, value of knowledge and faithful commitment made this work to be achieved. Once again, I appreciate both of you in guiding my research effort and offering words of encouragement and support throughout, hopefully that may Allah bless both you.

Secondly I present my unlimited thanks to my family. I never would have been able to complete this study without the support of you all. My father -Al-haj Abu Aref- who has been there for me in terms of his supports and advices during my study period. My brothers and sisters I love all of you, and acknowledge that your every day prayer were accepted by Allah.
Thirdly, I am also indebted to Mr Ahmad Ghassab Al-hawamedeh, the director of education Amman first district who helped me in administering the questionnaire and conducting the interviews with the selected teachers in the secondary schools in Amman.

Finally, I would like to evoke my appreciations and unforgettable thanks all of my friends in Malaysia and Jordan and every one who has contributed either morally or spiritually in the success of this work. Not forgetting, Universiti Utara Malaysia deserves all the gratitude by offering me a PhD.
ABSTRACT

This study attempted to investigate the relationship between stages of concern, adopter categories, obstacles faced by the teachers and the strategies used by the teachers in integrating ICT in the teaching and learning process in Jordanian public schools, while attitude toward computers was used as a moderator variable. A concern-based adoption model and Rogers' adopter categories were used as basis for this study. The researcher distributed 360 questionnaires to teachers who taught English, Math and Science in the Amman area in Jordan only 345 were usable.

Descriptive and inferential statistics including one way ANOVA, independent sample t-test, correlation and hierarchical regression were used to analyse the data. Data showed that Jordanian teachers exhibited high attitude and moderate concern towards integration of ICT. In addition, the teachers faced many obstacles when they integrate ICT in their classroom such as time-related obstacle, training and insufficient equipment. This study indicated that there were no significant differences in teachers' stage of concern based on their demographic variables which include teaching experience and subject matter taught. But the study indicated that significant differences were found between subject matter taught with regard to obstacles and strategies in ICT integration. Similarly, significant differences were found between teaching experience with regard to obstacles and strategies in ICT integration. English teachers as well as the teachers who belong to the group with 1-5 years of experience were found to face fewer obstacles and integrate ICT more than the other groups. This study also revealed that there was a positive relationship between concern and strategies in ICT integration. On the other hand, there was a negative relationship between obstacles in ICT integration and the strategies in ICT integration. Moreover, this study showed that teachers' attitudes toward computer did moderate the relationship between obstacles in ICT integration and the strategies in ICT integration. But, attitudes towards computer did not moderate the relationship between concern and strategies in ICT integration. The results showed that out of the thirteen hypotheses only three were rejected.

Findings from the interview showed that the early and late adopters differed in terms of integrating ICT in the classroom. It also confirmed the results of the questionnaire that Jordanian teachers faced many obstacles when integrating ICT for teaching and learning purpose. On the contrary, the interview showed that most of the teachers still employed conventional teaching strategies.

Based on the findings, several recommendations are provided including the need to provide training for late adopters, to synergize between the early and late adopters and to plan properly for technology integration in order to enhance technology integration in Jordanian schools.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>vii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>viii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xiv</td>
</tr>
<tr>
<td>List of Charts and Figure</td>
<td>xvi</td>
</tr>
<tr>
<td><strong>CHAPTER I</strong></td>
<td></td>
</tr>
<tr>
<td>1.0 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Educational System in Jordan</td>
<td>3</td>
</tr>
<tr>
<td>1.1.1 Jordan Education System</td>
<td>4</td>
</tr>
<tr>
<td>1.2 Problem Statement</td>
<td>5</td>
</tr>
<tr>
<td>1.3 Objective of the Study</td>
<td>11</td>
</tr>
<tr>
<td>1.4 Research Questions</td>
<td>12</td>
</tr>
<tr>
<td>1.5 Hypotheses of the Study</td>
<td>13</td>
</tr>
<tr>
<td>1.6 Purpose of the Study</td>
<td>14</td>
</tr>
<tr>
<td>1.7 Significance of the Study</td>
<td>14</td>
</tr>
<tr>
<td>1.8 Limitation and Scope of the Study</td>
<td>16</td>
</tr>
<tr>
<td>1.9 Operational Definition</td>
<td>16</td>
</tr>
<tr>
<td>1.9.1 Attitudes</td>
<td>16</td>
</tr>
<tr>
<td>1.9.2 Computer</td>
<td>16</td>
</tr>
<tr>
<td>1.9.3 Computer integration</td>
<td>16</td>
</tr>
<tr>
<td>1.9.4 Early adopter of ICT integration</td>
<td>16</td>
</tr>
<tr>
<td>1.9.5 Late adopter of ICT integration</td>
<td>16</td>
</tr>
<tr>
<td>1.9.6 The stages of concern</td>
<td>17</td>
</tr>
<tr>
<td>1.9.7 Teachers' strategies</td>
<td>17</td>
</tr>
<tr>
<td>1.9.8 Obstacles</td>
<td>17</td>
</tr>
<tr>
<td>1.9.9 Integration of ICT</td>
<td>17</td>
</tr>
<tr>
<td>1.10 Summary</td>
<td>17</td>
</tr>
<tr>
<td><strong>CHAPTER II</strong></td>
<td></td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>18</td>
</tr>
<tr>
<td>2.0 Introduction</td>
<td>18</td>
</tr>
<tr>
<td>2.1 ICT in Jordanian Schools</td>
<td>19</td>
</tr>
<tr>
<td>2.2 Integrating ICT in Teaching and Learning</td>
<td>21</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>2.2.1 Role of Teachers in Integration of ICT</td>
<td>21</td>
</tr>
<tr>
<td>2.2.2 Factors Hindering Computer Use</td>
<td>24</td>
</tr>
<tr>
<td>2.3 Attitudes of Teachers Toward Computers</td>
<td>26</td>
</tr>
<tr>
<td>2.4 Stages of Concern</td>
<td>28</td>
</tr>
<tr>
<td>2.5 Underpinning Theories</td>
<td>34</td>
</tr>
<tr>
<td>2.5.1 Diffusion of Innovations Theory</td>
<td>34</td>
</tr>
<tr>
<td>2.5.1.1 The Innovation-Decision Process Theory</td>
<td>34</td>
</tr>
<tr>
<td>2.5.1.2 Individual Innovativeness Theory</td>
<td>35</td>
</tr>
<tr>
<td>2.5.1.3 Rate of Adoption Theory</td>
<td>36</td>
</tr>
<tr>
<td>2.5.1.4 Perceived Attributes Theory</td>
<td>36</td>
</tr>
<tr>
<td>2.5.1.5 Owner categories</td>
<td>37</td>
</tr>
<tr>
<td>2.5.1.6 The Gap between Early and Late Adopters</td>
<td>40</td>
</tr>
<tr>
<td>2.5.2 Teacher’s Concern Theory</td>
<td>41</td>
</tr>
<tr>
<td>2.5.3 Constructivism</td>
<td>42</td>
</tr>
<tr>
<td>2.6 The ICT – Oriented Micro Models</td>
<td>43</td>
</tr>
<tr>
<td>2.7 Computer in Education</td>
<td>49</td>
</tr>
<tr>
<td>2.7.1 The Computer as Tutor</td>
<td>49</td>
</tr>
<tr>
<td>2.7.2 The Computer as Tool</td>
<td>50</td>
</tr>
<tr>
<td>2.7.3 The Computer as Tutee</td>
<td>51</td>
</tr>
<tr>
<td>2.8 The Barriers of Integrating ICT in the Teaching and Learning process</td>
<td>53</td>
</tr>
<tr>
<td>2.8.1 Main obstacles faced by teachers</td>
<td>58</td>
</tr>
<tr>
<td>2.8.1.1 Time</td>
<td>58</td>
</tr>
<tr>
<td>2.8.1.2 Training</td>
<td>58</td>
</tr>
<tr>
<td>2.8.1.3 Equipment and Access</td>
<td>59</td>
</tr>
<tr>
<td>2.8.1.4 Insufficient Funding</td>
<td>59</td>
</tr>
<tr>
<td>2.8.1.5 Administrative leadership</td>
<td>60</td>
</tr>
<tr>
<td>2.8.1.6 Computer self-efficacy</td>
<td>60</td>
</tr>
<tr>
<td>2.9 Research Framework</td>
<td>61</td>
</tr>
<tr>
<td>2.9.1 Independent Variables</td>
<td>61</td>
</tr>
<tr>
<td>2.9.2 Dependent Variables</td>
<td>62</td>
</tr>
<tr>
<td>2.9.3 Moderator Variable</td>
<td>62</td>
</tr>
<tr>
<td>2.10 Hypotheses Development</td>
<td>64</td>
</tr>
<tr>
<td>2.10.1 Stages of Concern and Demographic Variables</td>
<td>64</td>
</tr>
<tr>
<td>2.10.2 Obstacles in Technology Integration and Demographic Variables</td>
<td>65</td>
</tr>
<tr>
<td>2.10.3 Strategies of Technology Integration and Demographic Variables</td>
<td>66</td>
</tr>
<tr>
<td>2.10.4 The Relationship between Stages of Concern and Strategies of</td>
<td>68</td>
</tr>
<tr>
<td>Technology Integration in the Classroom</td>
<td></td>
</tr>
<tr>
<td>2.10.5 The relationship between obstacles in technology integration and</td>
<td>70</td>
</tr>
<tr>
<td>Strategies of Technology integration</td>
<td></td>
</tr>
<tr>
<td>2.10.6 Attitudes Toward ICT</td>
<td>70</td>
</tr>
</tbody>
</table>
4.5 QUANTATATIVE DATA ANALYSIS

Question one
  Question one first branch 104
  Question one second branch 104
  Question one third branch 113
  Question one fourth branch 117
Question two 120
Question three 122
Question four 124
Question five 125
Question six
  Question six branch A 126
  Question six branch B 127
  Question six branch C 128
Question seven
  Question seven branch A 129
  Question seven branch B 130
  Question seven branch C 131
Question eight
  Question eight branch A 132
  Question eight branch B 133
  Question eight branch C 134
Question nine 134
Question ten 135
Question eleven
  Skewness 137
  Multicollinearity 140
  Question Eleven (Analysis) 141

4.6 Qualitative Data Analysis 143

First question 143
  The First theme: The Administration Has a Major Role 143
  The first sub-theme: Motivating Teachers 145
  The Second Sub-theme: Overcoming Barriers to Integrating ICT 146
  The Second Theme: The Administration Has a Minor Role 148
  The Third Theme: The Administration Has No Role 149
Second question 150
  The First Theme: Training Teachers 150
  The Second Theme: Motivating Teachers 153
  The Third Theme: Providing Schools with Equipments and Access 154
  The Fourth Theme: Collaboration Between Teachers 155
  The Fifth Theme: Planning for the process of ICT Integration 156
Third question 156
  The First Theme: Training 157
  Second theme: Equipment and access 160
  Third theme: Time 162
  The Fourth Theme: Computer Self Efficacy 164
Fourth Question 164
  The First Theme: The Absence of Employing Any Strategy 164
4.7 Summary Of the Interviews

CHAPTER V

5.0 Introduction

5.1 Research Summary

5.2 Summary of Research Findings

5.3 Discussion of the research results

Question one
  Question one first branch
  Question one second branch
  Question one third branch
  Question one fourth branch

Question two

Question three

Question four

Question five

Question six first branch

Question six second branch

Question six third branch

Question seven first branch

Question seven second branch

Question seven third branch

Question eight first branch

Question eight second branch

Question eight third branch

Question nine

Question ten

Question eleven

5.4 Qualitative data

First question

Second question

Third question
Fourth question 211
Fifth question 212

5.5 A Comparison between the Results of the Quantitative and the Qualitative Data 213
5.6 Contributions of the study 215
5.7 Implications 217
5.8 Recommendations for Further Research 218
References 219
Appendix 237
LIST OF TABLES

Table 2.1 Welliver’s Instructional Transformation Model ........................................... 44
Table 2.2 ACOT Model .......................................................................................... 46
Table 3.1 Coefficients of Internal Reliability for the SoCQ ........................................... 85
Table 3.2 Test-Retest Correlations on the SoCQ ......................................................... 85
Table 3.3 The validity of stages of concern questionnaire ........................................... 86
Table 3.4 Coefficients of Internal Reliability for the CAS ......................................... 87
Table 3.5 The validity of computer attitudes scale ..................................................... 88
Table 3.6 Reliability of the Level of Implementation Technology .................................. 90
Table 3.7 Summary of Statistical Analysis .................................................................. 95
Table 4.1 Cronbach’s Alpha of Variable ..................................................................... 101
Table 4.2 Teachers’ profile ....................................................................................... 103
Table 4.3 The Levels of Stages of Concern Among Jordanian Teachers ....................... 104
Table 4.4 The Items of The Levels of Stages of Concern Among Jordanian Teachers ........ 106
Table 4.5 The Levels of Attitudes Toward Comuter Integration Among Teachers ....... 109
Table 4.6 Teacher’s Attitudes toward Computer Technologies (Negatively-stated ........ 110
Table 4.7 Teacher’s Attitudes towards Computer Technologies (Positive-stated ........ 112
Table 4.8 The levels of Obstacles in Technology Integration Among Teachers .......... 113
Table 4.9 The Items of The levels of Obstacles in Technology Integration Among .......... 115
Table 4.10 The Levels of Technology Integration Strategies Among teachers in .......... 118
Table 4.11 The Distribution of Early and Late Adopters Among Jordanian .......... 125
Table 4.12 Group Differences for Teachers’ Stages of Concern Towards .............. 126
Table 4.13 Group Differences for Teachers' Stages of Concern Towards

Technology Based on Their Subjects Matter Taught

Table 4.14 Group Differences for Teachers' Stages of Concern Towards

Technology Based on Their Training Attendance

Table 4.15 Group Differences for Teachers' Obstacles in Technology Integration

Based on Their Teaching Experience

Table 4.16 Group Differences for Teachers' Obstacles in Technology Integration

Based on Their Subjects Matter Taught

Table 4.17 Group Differences for Teachers' Obstacles in Technology Integration

Based on Their Training Attendance

Table 4.18 Group Differences for Teachers' Technology Integration Strategies

Based on Their Teaching Experience

Table 4.19 Group Differences for Teachers' Technology Integration Strategies

Based on Their Subjects Matter Taught

Table 4.20 The Differences in Technology Integration Strategies based on Their

Training Attendance

Table 4.21 The Relationship between Teacher’s Stages of Concern and

Technology Integration Strategies

Table 4.22 The Relationship between Obstacles Faced by Teachers and

Technology Integration Strategies

Table 4.23 Skewness Results

Table 4.24 Collinearity Statistics

Table 4.25 Hierarchical Regression Analysis
LIST OF CHARTS AND FIGURES

Figure 2.1  Research Framework  63
Figure 3.1  Sampling Selection  78
Figure 3.2  Overview of Methodology  79

Chart 4.1  The Distribution of Teachers as Early or Late Adopters  121
Chart 4.2  The Distribution of Early and Late Adopters Among Jordanian

............Teachers in Term of Teaching experience  123
Chart 4.3  The Distribution of Early and Late Adopters Among Jordanian

............Teachers in Term of Subject Matter Taught  124
Chart 4.4  Normality Distribution Represented by Histogram  136
Chart 4.5  The Normal plot (scatterplot) of Regression Standardized Residual  138
Chart 4.6  P-P plot of Regression Standardized Residual  139
CHAPTER I

INTRODUCTION

1.0 Introduction

The process of teaching and learning in the modern era has undergone radical and basic changes due to continuous developments in technological, instructional, and pedagogical domains (Bonk & King, 1998; Marina, 2001). Information and Communications Technology (ICT) is reported to change the traditional educational foundations that ought to facilitate and enhance learning. The use of ICT in Jordanian schools can be enhanced through effective continuing professional development (CPD). The Jordanian Ministry of Education feels that ICT should be integrated in teaching and learning.

ICT revolution has brought with it a variety of means, including productivity software, multimedia and network devices along with the diffusion of personal computers which opened new horizons of the development and implementation of new and innovative teaching strategies over the last decade. Integrating ICT in the learning process was motivated by the belief that this technology helps improve and prepare students to participate effectively in the 21st century workplace (Butzin, 2000; Hopson, Simms, & Knezek, 2002; Reiser, 2001).
The contents of the thesis is for internal user only
References


Hall, G. E., & George, A. A. (1979). *Stages of Concern about the innovation: The concept, initial verification, and some implications (1st draft)*. The University of Texas at Austin: Research and Development Center for Teacher Education. (ERIC Documentation Reproduction Service No. ED 187716).


Snider, S. L., & Gershner, V. T. (1999). *Beginning the change process: Teacher stages of concern and levels of Internet use in curriculum design and delivery in one middle and high school setting*. TX, US. (ERIC Document Reproduction Service no. ED 432 300).


