

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 Abudlmalek 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 lesser 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

ACKNOWLEDGEMENT	v
ABSTRACT	vii
Table of Contents	viii
List of Tables	xiv
List of Charts and Figure	xvi
CHAPTER I	1
1.0 Introduction	1
1.1 Educational System in Jordan	3
1.1.1 Jordan Education System	4
1.2 Problem Statement	5
1.3 Objective of the Study	11
1.4 Research Questions	12
1.5 Hypotheses of the Study	13
1.6 Purpose of the Study	14
1.7 Significance of the Study	14
1.8 Limitation and Scope of the Study	16
1.9 Operational Definition	16
1.9.1 Attitudes	16
1.9.2 Computer	16
1.9.3 Computer integration	16
1.9.4 Early adopter of ICT integration	16
1.9.5 Late adopter of ICT integration	16
1.9.6 The stages of concern	17
1.9.7 Teachers' strategies	17
1.9.8 Obstacles	17
1.9.9 Integration of ICT	17
1.10 Summary	17
CHAPTER II	18
LITERATURE REVIEW	18
2.0 Introduction	18
2.1 ICT in Jordanian Schools	19
2.2 Integrating ICT in Teaching and Learning	21

2.2.1	Role of Teachers in Integration of ICT	21
2.2.2	Factors Hindering Computer Use	24
2.3	Attitudes of Teachers Toward Computers	26
2.4	Stages of Concern	28
2.5	Underpinning Theories	34
2.5.1	Diffusion of Innovations Theory	34
2.5.1.1	The Innovation-Decision Process Theory	34
2.5.1.2	Individual Innovativeness Theory	35
2.5.1.3	Rate of Adoption Theory	36
2.5.1.4	Perceived Attributes Theory	36
2.5.1.5	Adopter categories	37
2.5.1.6	The Gap between Early and Late Adopters	40
2.5.2	Teacher's Concern Theory	41
2.5.3	Constructivism	42
2.6	The ICT – Oriented Micro Models	43
2.7	Computer in Education	49
2.7.1	The Computer as Tutor	49
2.7.2	The Computer as Tool	50
2.7.3	The Computer as Tutee	51
2.8	The Barriers of Integrating ICT in the Teaching and Learning process	53
2.8.1	Main obstacles faced by teachers	58
2.8.1.1	Time	58
2.8.1.2	Training	58
2.8.1.3	Equipment and Access	59
2.8.1.4	Insufficient Funding	59
2.8.1.5	Administrative leadership	60
2.8.1.6	Computer self-efficacy	60
2.9	Research Framework	61
2.9.1	Independent Variables	61
2.9.2	Dependent Variables	62
2.9.3	Moderator Variable	62
2.10	Hypotheses Development	64
2.10.1	Stages of Concern and Demographic Variables	64
2.10.2	Obstacles in Technology Integration and Demographic Variables	65
2.10.3	Strategies of Technology Integration and Demographic Variables	66
2.10.4	The Relationship between Stages of Concern and Strategies ofTechnology Integration in the Classroom	68
2.10.5	The relationship between obstacles in technology integration andStrategies of Technology integration	70
2.10.6	Attitudes Toward ICT	70

2.11 Summary	72
CHAPTER III	77
RESEARCH METHODOLOGY	77
3.0 Introduction	77
3.1 Research Design	79
3.2 Population and Sampling	79
3.3 Instruments (Questionnaire)	81
3.3.1 Questionnaire Validity (Content Validity)	82
3.3.2 Adopter's Categories	82
3.3.3 Stage of Concern	84
3.3.3.1 Reliability of stages of concern questionnaire	85
3.3.3.2 Validity of Stages of Concern Questionnaire	86
3.3.4 Computer Attitude Scale	86
3.3.4.1 Reliability of Computer attitude scale	87
3.3.4.2 Validity of Computer attitude scale	88
3.3.5 Obstacles scale	88
3.3.6 Strategies of technology integration	89
3.3.6.1 Reliability of Level of Technology Implementation (LOTI)	90
3.3.6.2 Validity of Level of Technology Implementation (I.OTI)	90
3.4 Interview	91
3.4.1 Interview procedure	91
3.4.2 Trustworthiness of interview	92
3.4.3 Analysis of the interview	93
3.5 procedures	94
3.6 Data analysis	95
3.7 Pilot study	95
3.8 Summary	97
CHAPTER IV	98
4.0 Introduction	98
4.1 Factor Analysis for Independent Variables	100
4.1.1 Factor Analysis for Dependent Variable	100
4.1.2 Factor Analysis for Moderator Variable	101
4.2 Instruments Reliability	101
4.3 Respondent Rate	102
4.4 Profile of Respondents	102

4.5 QUANTATATIVE DATA ANALYSIS	104
Question one	104
Question one first branch	104
Question one second branch	109
Question one third branch	113
Question one fourth branch	117
Question two	120
Question three	122
Question four	124
Question five	125
Question six	126
Question six branch A	126
Question six branch B	127
Question six branch C	128
Question seven	128
Question seven branch A	129
Question seven branch B	130
Question seven branch C	131
Question eight	131
Question eight branch A	132
Question eight branch B	133
Question eight branch C	134
Question nine	134
Question ten	135
Question eleven	135
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 Absance of Employing Any Strategy	164

The Second Theme: Using software programs	166
The Third Theme: Using the Internet	168
The Fourth Theme: Visual and Audio Properties	168
The Fifth Theme: Allocating Time for Students to Practice Their Computer Skills	169
Fifth question	170
The First Theme: Equipments and Access	170
The Second Theme: Training	172
The Third Theme: Time	173
The Fourth Theme: Motivating Teachers	174
The Fifth Theme: Planning for the process of ICT integration	174
The Sixth Theme: collaboration between teachers	175
4.7 Summary Of the Interviews	176
CHAPTER V	177
5.0 Introduction	177
5.1 Research Summary	178
5.2 Summary of Research Findings	181
5.3 Discussion of the research results	182
Question one	182
Question one first branch	183
Question one second branch	185
Question one third branch	187
Question one fourth branch	190
Question two	191
Question three	192
Question four	193
Question five	193
Question six first branch	194
Question six second branch	195
Question six third branch	196
Question seven first branch	197
Question seven second branch	199
Question seven third branch	200
Question eight first branch	201
Question eight second branch	202
Question eight third branch	203
Question nine	204
Question ten	205
Question eleven	206
5.4 Qualitative data	207
First question	207
Second question	208
Third question	210

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 in Jordanian schools	109
Table 4.6 Teacher's Attitudes toward Computer Technologies (Negatively-stated Statement)	110
Table 4.7 Teacher's Attitudes towards Computer Technologies (Positive-stated Statements)	112
Table 4.8 The levels of Obstacles in Technology Integration Among Teachers in Jordanian Schools	113
Table 4.9 The Items of The levels of Obstacles in Technology Integration Among Teachers in Jordanian Schools	115
Table 4.10 The Levels of Technology Integration Strategies Among teachers in Jordanian schools	118
Table 4.11 The Distribution of Early and Late Adopters Among Jordanian Teachers in Term of Training Attendance	125
Table 4.12 Group Differences for Teachers' Stages of Concern Towards Technology Based on Their Teaching Experience	126

Table 4.13 Group Differences for Teachers' Stages of Concern Towards Technology Based on Their Subjects Matter Taught	127
Table 4.14 Group Differences for Teachers' Stages of Concern Towards Technology Based on Their Training Attendance	128
Table 4.15 Group Differences for Teachers' Obstacles in Technology Integration Based on Their Teaching Experience	129
Table 4.16 Group Differences for Teachers' Obstacles in Technology Integration Based on Their Subjects Matter Taught	130
Table 4.17 Group Differences for Teachers' Obstacles in Technology Integration Based on Their Training Attendance	131
Table 4.18 Group Differences for Teachers' Technology Integration Strategies Based on Their Teaching Experience	132
Table 4.19 Group Differences for Teachers' Technology Integration Strategies Based on Their Subjects Matter Taught	133
Table 4.20 The Differences in Technology Integration Strategies based on Their Training Attendance	134
Table 4.21 The Relationship between Teacher's Stages of Concern and Technology Integration Strategies	134
Table 4.22 The Relationship between Obstacles Faced by Teachers and Technology Integration Strategies	135
Table 4.23 Skewness Results	137
Table 4.24 Collinearity Statistics	140
Table 4.25 Hierarchical Regression Analysis	141

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 JordanianTeachers in Term of Teaching experience	123
Chart 4.3 The Distribution of Early and Late Adopters Among JordanianTeachers 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

- AbdalHaqq, I. (1996). *Making time for teachers professional development*. ERIC Clearinghouse on Teaching and Teacher Education, Washington, DC. (ERIC Document Reproduction Service No. ED400259).
- AbdalHaqq, I. (1995). *Infusing technology into preservice teacher education*. ERIC Digest. Available online at: http://www.ed.gov/databases/ERIC_Digests/ed389699.html [Retrieved December 2, 2004].
- Abu-Omar, A. (1998). *Using computers in schools of south directorate in Jordan and teachers and students attitudes toward it*. M.E thesis, Mouta University, Jordan.
- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888-918.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitude and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall Inc.
- Alajami, J. (2004). *The obstacles of using computers in teaching Islamic education in al-khabar governorate in kingdom of Saudi Arabia*. Unpublished M.E. thesis, University of Jordan, Jordan.
- Al-Hirsh, M. (2006). *The effects of using the computer on enhancing writing composition performance compared with traditional method for first secondary grade students in west north Badia educational directorate*. M.E thesis, Al-Albait University, Jordan.
- Alfieri, P. (1998). *Stages of concern of defense systems management college faculty about technology-based education and training*. Unpublished PhD thesis, University of Virginia, USA.
- Al-Qadi, H. (2003). *The impact of vocal and audio visual effects with the use of computers in teaching Islamic education for the sixth graders*. M.E thesis, Aal-Albait University, Jordan.
- Al-Senaidi, S., Lin, L., & Poirot, J. (2009). Barriers to adopting technology for teaching and learning in Oman. *Computers & Education*. Retrieved May 15, 2009, from www.elsevier.com/locate/compedu
- Anderson, T., Varnhagen, S., & Campbell, K. (1998). Faculty adoption of teaching and learning technologies: Contrasting earlier adopters and mainstream faculty. *The Canadian Journal of Higher Education*, 28(2), 71-98.
- Aneke, N. O., & Finch, C. R. (1997). Teachers' stages of concern about a school-wide reform. *Journal of Vocational Education Research*, 22(1), 55-70.

- Atkins, N. E., & Vasu, E. S. (2000). Measuring knowledge of technology usage and stages of concern about computing: A study of middle school teachers. *Journal of Technology and Teacher Education*, 8(4), 279-302.
- Author, A., & Writer B. (2003). Paper title: What it's called. In G. Crisp, D. Thiele, I. Scholten, S. Barker and J. Baron (Eds), *Interact, Integrate, Impact: Proceedings of the 20th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education*. Adelaide, 7-10 December 2003.
- Bataineh, R., & Baniabdelrahman, A. (2006). Jordanian EFL students' perceptions of their computer literacy. *International Journal of Education and Development using Information and Communication Technology*, 2(2), 3550.
- Baylor, J. (1985). *Assessment of microcomputer attitudes of education students*. Paper presented at the Annual Meeting of the Mid_ south Education Research Association (14th, Biloxi, Ms).
- Becker, H. J. (1994). How exemplary computer-using teachers differ from other teachers: Implications for realizing the potential of computers in schools. *Journal of Research on Computing in Education*, 26(2), 291– 321.
- Becker, H. J., Ravtiz, J. L., & Wong, Y. J. (1999). Teacher and teacher-directed student use of computers and software center for research on information technology and organization ,University of California, Irvine and University of Minnesota Available on-line at www.cito.uci.edu/tlc.finding/computeruse/ Retrieved March 15, 2000
- Beggs, T. (2000). *A Study of the influences and barriers to faculty use of instructional technology in higher education*. World Conference on Educational Multimedia, Hypermedia and Telecommunications 2000(1), 106-111. Retrieved October 10, 2002, from: <http://dl.aace.org/1226>
- Beggs, T. A. (2000). *Influences and barriers to the adoption of instructional technology*. In Proceedings of the Mid-South Instructional Technology Conference. (ERIC Document Reproduction Service No. ED446764).
- Bennett, J., & Bennett, L. (2003). A review of factors that influence the diffusion of innovation when structuring a faculty training program. *Internet and Higher Education*, 6(1), 53-63.
- Bond, E. A. (1988). Diversity of microcomputer implementation: A process perspective. *Journal of Research on Computing in Education*, 24(4), 321-330.
- Bonk, C. J., & King, K. S. (1998). *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse*. Hillsdale, NJ: Lawrence Erlbaum Associates.

- Bradshaw, L. K. (1997). Technology-supported change: A staff development opportunity. *NASSP Bulletin*, 81, 86–92.
- Brooks, M., & Brooks, J. (1993). *In search of understanding: The case for constructivist classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Byrne, B. (1998). *The foundation of literacy. The child's acquisition of the alphabetic principle*. Hove, UK: Psychology Press.
- Brzycki, D., & Dudt, K. (2005). Overcoming barriers to technology use in teacher preparation programs. *Journal of Technology and Teacher Education*, 13(4), 619-641.
- Butzin, S. M. (2000). Using instructional technology in transformed learning environments: An evaluation of project child. *Journal of Research in Computing Education*, 33(4), 367-384
- Cafolla, R., & Knee, R. (1995). Factors limiting technology in education: The Leadership gap. In D. Carey, R. Carey, D. A. Willis, & J. Willis (Eds.), *Technology and Teacher Education 1995 Annual*. Charlottesville VA: Association for the Advancement of Technology and Teacher Education.
- Campione, J. C., Brown, A. L., & Jay, M. (1992). *Computers in a community of learners. In Computer-Based Learning Environments and Problem Solving*. E. D. Corte, M. C. Linn, H. Mandl, & L. Verschaffel (Eds.). New York: Springer-Verlag.
- Cannella, G. S., & Reiff, J. C. (1994). Individual constructivist teacher education: Teachers as empowered learners. *Teacher Education Quarterly*, 21(3), 27-38.
- Cates, W. M., & McNall, P. A. (1993). Inservice training and university coursework: Its influence on computer use and attitudes among teachers of learning disabled students. *Journal of Research on Computer in Education*, 25(4), 448-463
- Cecchini, S., & Scott, C. (2003). Can information and communications technology applications contribute to poverty reduction? Lessons from rural India. *Information Technology for Development*, 10, 73–84.
- Chamblee, G., & Slough, S. (2002). Mathematics classrooms: Is the implementation process the same for both disciplines? *Journal of Computers in Mathematics and Science Teaching*, 21(1), 3–15.
- Chiero, R. T. (1997). Teachers' perspectives on factors that affect computer use. *Journal of Research on Computing in Education*, 30, 122-135.

- Chin, S. S., & Hortin, J. A. (1993-94). Teachers' perceptions of instructional technology and staff development. *Journal of Educational Technology Systems*, 22(2), 83-98.
- Cicchelli, T., & Baecher, R. (1989). Microcomputers in the classroom: Focusing on teacher concerns. *Educational Research Quarterly*, 13(1), 37-46.
- Clements, D. H. (1986). Effects of Logo and CAI Environments on Cognition and Creativity. *Journal of Educational Psychology*, 78(4), 309-318.
- Clements, D. H., & Gullo, D. F. (1984). Effects of computer programming on young children's cognition. *Journal of Educational Psychology*, 76(6), 1051-1058.
- Coburn, P., Kelman, P., Roberts, N., Syder, T., Watt, D., & Weiner, C. (1982). *Practical guide to computer in education*. USA: Addison-Wesley.
- Colley, A. M., Galc, M. T., & Harris, T. A. (1994). Effects of gender role identity and experience on computer attitude components. *Journal of Educational Computing Research*, 10(2), 129-137.
- Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, 38(4), 813-834.
- D'Amico, J. J. (1999). *Learning with technology: Integrating new technologies into classroom instruction*. Oak Brook, IL: North Central Regional Technology in Education Consortium.
- DeCorte, E. (1990). Learning with new information technologies in schools: Perspectives from the psychology of learning and instruction. *Journal of Computer Assisted Learning*, 6, 69-87.
- Dede, C. (1997). Rethinking how to invest in technology. *Educational Leadership*, 55(3), 1, 2-16.
- Demiraslan, Y., Usluel, Y. (2008). ICT integration processes in Turkish schools: Using activity theory to study issues and contradictions. *Australasian Journal of Educational Technology*, 24(4), 458-474.
- Denscombe, M. (2003). *The Good Research Guide for small-scale social research projects (2nd ed.)*. Philadelphia: Open University Press.
- Department for Education and Employment (DfEE). (1998). Teaching: High status, high standards. Requirements for courses of Initial Teacher Training, Circular 4/98, London: DfEE.
- Dockstader, J. (1999). Teachers of 21 century know the what, why, and how of technology integration. *T.H.E. journal (Technological Horizons In Education)*, 26(6), 73-74.

- Dunn, S., & Ridgway, J. (1994). What GATE did: An exploration of the effects of CATE criteria on student's use of information technology during teaching practice. *Journal of Information Technology for Teacher Education*, 3(1), 39-50.
- Dwyer, D. C., Ringstaff, C., & Sandholtz, J. H. (1992). *The evolution of teachers' instructional beliefs and practices in high -access-to-technology classrooms, first- fourth year findings*. Apple Classrooms of Tomorrow.
- Dwyer, D. C., Ringstaff, C., & Sandholtz, J. H. (1991). Change in teachers' beliefs and practices in technology-rich classroom. *Educational Leadership*, 48(6), 45-52.
- Easdown, G. (1997). IT in initial teacher education: A survey of feelings and preconceptions. In A. Pendry & C. O'Neill (Eds.), *Principles and practice: Analytical perspectives on curriculum reform and changing pedagogy for history teacher educators*, Lancaster, Standing Conference of History Teacher Educators (SCHTE), 102-112.
- Education in Jordan: A commitment to excellence. (n.d.). Retrieved July 5, 2006, from www.kinghussein.gov.jo/resources3.html
- Erdem, M. (2008). Teachers' use of the internet in teaching: A case study in Turkey on certain variables. *Pakistan Journal of Social Sciences*, 5(1), 23-30.
- Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47-61.
- Evern, S., & Ilker, Y. (2007). *An Analysis of prospective e-learning change agents' concerns toward e-learning in Turkey: A case from computer education and instructional technology department in Ankara*. Paper presented at the International Educational Technology Conference (IETC), 7th, Nicosia, Turkish Republic of Northern Cyprus, 3-5 May 2007.
- Fisher, M. (1996). Integrating information technology: Competency recommendations by teachers for teacher training. *Journal of Information Technology for Teacher Education*, 5(3), 233-238.
- Fisher, M. (2000). Computer skills of initial teacher education students. *Journal of Information Technology for Teacher Education*, 9(1), 109-123.
- Fuller, F. F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal*, 6, 207-226.
- Germann, P. J., & Sasse, C. M. (1997). Variations in concerns and attitudes of Science teachers in an educational technology development program. *Journal of Computers in Mathematics and Science Teaching*, 16(3/2), 405-423.

- Gbomita, V. (1997). The adoption of microcomputers for instruction: Implications for emerging instructional media implementation. *British Journal of Educational Technology*, 28(2), 87-101.
- Geisert, P. G., & Futrell, M. K. (1995). *Teachers, computers, and curriculum: Microcomputers in the classroom (2nd ed.)*. Needham Heights, MA: Allyn and Bacon.
- Geoghegan, W. (1995). Stuck at the barricades: Can information technology really enter the mainstream of teaching and learning? *Change*, 27(2), 22-30.
- George, A. A. (1977). *Development and validation of concerns questionnaire*. Paper presented at the annual meeting of the American Educational Research Association (61st, New York). (ERIC Document Reproduction Service No. ED 147314).
- Gershner, V. T., & Snider, S. L. (2001). Integrating the use of Internet as an instructional tool: Examining the process of change. *Journal of Educational Computing Research*, 25, 283-300.
- Glennan, T. K., & Melmed, A. (1996). *Fostering the use of educational technology: Element of a national strategy*. Santa Monica, CA: Rand Corp.
- Glickman, C. (1991). Pretending not to know what we know. *Educational Leadership*, 48(8), 4-10.
- Goddard, M. (2002). What do we do with these computers? Reflections on technology in the classroom. *Journal of Research on Technology in Education*, 35(1), 19-26.
- Grant, C. M. (2001). *Professional development in technological age: New definitions, old challenges, new resources*. Retrieved April 30, 2004 from http://ra.terc.edu/publications/TERC_pubs/tech-infusion/prof_dev/prof_dev_intro.html
- Green, K., Kluever, R., Lam, T., Staples, C., & Hoffman, E. (1993). The effect of computer instruction on attitudes toward computers and computer-related teaching skills. *Journal of Technology and Teacher Education*, 1, 423-435.
- Green, S. B., & Salkind, N. J. (2005). *Using SPSS for windows: Analyzing, and understanding data*. Upper Saddle River: Prentice Hall.
- Hadley, M., & Sheingold, K. (1993). Commonalities and distinctive pattern in teachers' integration of computer. *American Journal of Education*, 101, 261-315.
- Hakkinen, P. (1994-95). Changes in computer anxiety in a required computer course. *Journal of Research on Computing in Education*, 27(2), 141-153.

- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*. Upper Saddle River: Prentice Hall.
- Hall, G. E., Loucks, S. F., Rutherford, W. L., & Newlove, B. W. (1975). Levels of use of the innovation: A framework for analyzing innovation adoption. *Journal of Teacher Education*, 26 (1), 52-56.
- 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).
- Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. Albany: State University of New York Press.
- Hall, G. E., George, A. A., & Rutherford, W. A. (1986). *Measuring stages of concern about the innovation: A manual for use of the SoC Questionnaire*. R&D Report No. 3032, The University of Texas at Austin: Research and Development Center for Teacher Education. Southwest Educational Development Laboratory: Austin, Texas.
- Hania, R. (2007). *The effect of using computer in learning passing skills from above shoulders in volleyball Game for tenth graders*. M.E thesis, Alyarmouk University, Jordan.
- Harris, J. (1997). Who to hook and how: Advice for teacher trainers. *Learning and Leading with Technology*, 24(7), 54-57.
- Haydn, T., & Barton, R. (2007). Needs and different agendas: How trainee teachers make progress in their ability to use ICT in subject teaching. Some lessons from the UK. *Computers & Education*, 49(4), 1018-1036.
- Hedney, B. (1998). The professional development of teachers in an information technology era. *OUTPUT*, 19(1), 15-17.
- Hickey, D. T., Kindfield, A. C. H., Horwitz, P., & Christie, M. A. (2000). *Integrating instruction, assessment, and evaluation in a technology-based genetics environment: The GenScope follow-up study*. Paper presented at the Proceedings of the International Conference of the Learning Sciences, Ann Arbor, MI.
- Hoffman, B. (1997). Integrating technology into schools. *Educations Diges*, 62(52), 51-55.
- Hopson, M. H., Simms, R. L., & Knezek, G. A. (2002). Using a technology-enriched environment to improve higher-order thinking skills. *Journal of Research on Computing in Education*, 34(2), 109-119.

- Honey, M., & Moeller, B. (1990). *Teachers' beliefs and technology integration: Different values, different understandings*. (Technical Report No. 6. Center for Technology in Education. Grant No. 1-135562167-A1). Washington, DC: U.S. Department of Education. Office of Educational Research and Improvement.
- Hooper, S., & Reiber, L. P. (1995). Teaching with Technology. In A.C. Ornstein (Ed.), *Teaching: Theory into practice*, (pp.154-170). Needham Heights, MA: Allyn and Bacon.
- Hope, W. C. (1997). Why technology has not realized its potential in schools: A perspective. *American Secondary Education*, 25(4), 2-7.
- Huberman, A. M., & Miles, M. B. (1984). *Innovation up Close*. New York: Plenum Press.
- Hunt, N. P., & Bohlin, R. M. (1991). *Entry attitude of students toward using computers*. California Educational Research Association. ERIC Educational Document (ED 345706).
- INTEL. (2007). The Intel teach program brings 21st century skills to Jordanian teachers. Retrieved March 5, 2009, from com/pressroom/kits/.../teach/9332_Jordan_CS.pdf
- International Society for Technology in Education (2007). Retrieved June 7, 2008, from www.iste.org.
- Isman, A., Yaratan, H., Cancer, H. (2007). How technology is integrated into Science education in a developing country: North Cyprus case. *The Turkish Online Journal of Educational Technology*, 6(3).
- Jacobsen, D. M. (1998). *Adoption patterns and characteristics of faculty who integrate ICT for teaching and learning in higher education*. Unpublished PhD thesis, University of Calgary, USA.
- Jewett, J., Tertell, L., King-Taylor, M., Parker, D., Tertell, L., & Orr, M. (1998). Four early childhood teachers reflect on helping children with special needs make the transition to kindergarten. *The Elementary School Journal*, 98(4), 329-338.
- Jordan - Education system. (n.d.). Retrieved September 3, 2006. from www.unesco.org/iau/onlinedatabases/systems_data/jo.rtf
- Jung, I. (2005). ICT-pedagogy integration in teacher training: Application cases worldwide. *Educational Technology and Society*, 8 (2), 94-101.
- Kemp, J. (1996). School restructuring: Your school can do it. *Techtrends*, 41(1), 12-15.

- King, J., Bond, T., & Blandford, S. (2002). An investigation of computer anxiety by gender and grade. *Computers in Human Behavior, 18*, 69-84.
- Kinnaman, D. E. (1994). What it really means to integrate technology. *Technology and Learning, 14*(8), 130-131.
- Kinzie, M. B., & Delcourt, M. A. (1991). *Computes technologies in teacher education: The measurement of attitudes and self-efficacy*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL. (ERIC Document Reproduction Service No. ED 33 1 89 1)
- Kirby, B. M., & Smith, W. (1998). *Stages of Concern of administrators and teachers in the implementation of the school-to-work transition initiative in North Carolina*. Proceedings of the North Carolina Council of Vocational Teacher Educators Research Conference, 13, 35-40.
- Knee, R. H. (1996). *The relationship of selected principal characteristics to the integration of technology in schools*. Unpublished PhD thesis, Florida Atlantic University, USA.
- Knowlton, D. S. (2000). A theoretical framework for the online classroom: A defense and delineation of a student-centered pedagogy. *New Directions for Teaching and Learning, 84*, 5-14.
- Koohang, A. A. (1989). A study of attitudes toward computers: Anxiety, confidence, liking, and perception of usefulness. *Journal of Research on Computing in Education, 22*(2), 137-150.
- Kuzu, A. (2007). *Need of school technology advisor of primary and secondary schools in Turkey*. Paper presented at the International Educational Technology (IETC) Conference (7th, Nicosia, Turkish Republic of Northern Cyprus, May 3-5, 2007)
- Lancaster, M. (2000). *A study of the extent and nature of computer use in Saskatchewan high school accounting instruction, and some of the factors that influence computer use*. PhD thesis, University Of Regina, Canada.
- Lawton, J., & Gerschner, V. T. (1982). A review of the literature on attitudes towards computers and computerized instruction. *Journal of Research and Development in Education, 16*(1), 50-55.
- Lee, D. (1997). Factors influencing the success of computer skills learning among in-service teachers. *British Journal of Educational Technology, 28*(2), 139-141.
- Lee, H. (2001). *Teacher's perceptions of technology: Four categories of concerns*. Paper presented at the National Convention of the Association for Educational Communications and Technology (ERIC Document Reproduction Service no. ED 470 096).

- Levine, T., & Donitsa-Schmidt, S. (1998). Computer use, confidence, attitudes, and knowledge: Causal analysis. *Computer in Human Behavior*, 14(1), 125-146.
- Linnell, C. C. (1992). Concerns of technology education teachers regarding curriculum change. *Epsilon Pi Tau*, 18(1), 45-52.
- Liu, Y., & Huang, C. (2005). Concerns of teachers about technology integration in the USA. *European Journal of Teacher Education*, 28(1), 35-47.
- Liu, Y., Theodore, P., & Lavelle, E. (2004). A preliminary study of the impact of online instruction on teachers' technology concerns. *British Journal of Educational Technology*, 35(3), 377-379.
- Loucks-Horsley, S. (1996). *The concerns-based adoption model: A model for change in individuals*. In R. Bybee (Ed.), National standards & the Science curriculum. Retrieved April 18, 2005 from <http://www.nas.edu/rise/backg4a.htm>
- Loyd, B. H., & Gressard, C. (1984). The effects of sex, age, and computer experience on computer attitudes. *AEDS Journal*, 18(2), 67-77.
- Loyd, B. H., Loyd, D. E., Siann, G., & Macleod, J. (1987). Gender and computer experience as factors in the computer attitudes of middle school students. *Journal of Early Adolescence*, 7(1), 13-19.
- Loyd, B. H., & Loyd, D. E. (1985). The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and Psychological Measurement*, 45, 903-908.
- Loyd, B., & Gressard, C. (1984). Reliability factorial validity of computer attitude scale. *Educational and Psychological measurement*, 44, 501-505.
- Maddux, C. D. (1998). Barriers to the successful use of information technology in education. *Computers in the Schools*, 14(3/4), 5- 11.
- Mahmod, R., Dahlan, N., Karia, N., & Asaari, M. (2005). Attitudinal Belief on Adoption of E-MBA Program in Malaysia. *Turkish Online Journal of Distance Education*, 6(2).
- Maney, J. K. (1999). *The role of technology in education: Policy, pitfalls, and potentials*. In G. J. Cizek (Ed.), Handbook of educational policy (pp. 387-415). San Diego, CA: Academic Press.
- Manternach-Wigans, L. K., & Bender, C. L., & Maushak, N. J. (1999). *Technology integration in Iowa high schools: Perceptions of teachers and students*. College of Education, Iowa State University. Retrieved October 4, 2006 from http://www3.iptv.org/iowa_database/StarSchools/supdocs/monograph98.pdf

- Marcinkiewicz, H. R. (1993/1994). Computers and teachers: Factors influencing computer use in the classroom. *Journal of Research in Computing Education*, 26(2), 220-237.
- Marcinkiewicz, H. R., & Welliver, P. W. (1993). *Procedures for assessing teachers' computer use based on instructional transformations*. (pp. 7). New Orleans: 15th National Convention of the Association of Educational Communications and Technology
- Marina, S.T. (2001). Facing the challenges, getting the right way with distance learning. *Education at a Distance*, 15(30), 1-8.
- Mehrens, W. A., & Lehmann, I. J. (1984). *Measurement and evaluation in education and psychology* (3rd ed.). New York: Holt, Rinehart & Winston.
- Mellar, H., & Jackson, A. (1994). The changing picture of information technology experience in post graduate teacher training. *Journal of Computer Assisted Learning*, 10(1), 14-22.
- Merriam, S. B. (1998): *Qualitative research and case study applications in education*. London: Sage.
- Merz, J. A. (1996). *Stages of concern of managers about the adoption of satellite systems for training the defense finance and accounting service*. (PhD thesis, Virginia Polytechnic Institute and State University, 1996). Dissertation Abstracts International, 57 (11A), p. 4624, Accession No. AAG9712739.
- Mevarech, A. R., & Light, P. H. (1992). Peer-based interaction at the computer: Looking backward, looking forward. *Learning and Instruction*, 2, 275-280.
- Mills, S. C. (1999). *Integrating ICT in classrooms: Teacher concerns when implementing an integrated learning system*. In Society for Information Technology and Teacher Education International Conference. (ERIC N 432 289)
- Mills, S. C., & Tincher, R. C. (2003). Be the technology: A developmental model for evaluating technology integration. *Journal of Research on Technology in Education*, 35(3), 382-401.
- Ministry of Education (2006). E-learning coordination unit. Retrieved August 12, 2007, from http://www.moe.gov.jo/learning/vision_13.htm
- Mnsh, B., Moroz, A. (1997). *An examination of the factor structures of the computer attitude scale*. Paper presented at the annual meeting of the American Educational research Association, Chicago.
- Moersch, C. (2001). Next steps using LoTi as a research tool. [Electronic version]. *Learning and Leading with Technology*, 29(3), 22-27. Retrieved October 15, 2004, from <http://www.learning-quest.com/software/NextSteps2001.pdf>

- Moersch, C. (1999). Assessing current technology level of use in the classroom: a key to efficient staff development and technology planning. [Electronic version]. *Learning and Leading with Technology*, 26(8), 40-49.
- Moersch, C. (1997). Computer efficiency: Measuring the instructional use of technology. *Learning and Leading with Technology*, 24(4), 52-56.
- Moersch, C. (1995). Levels of technology implementation: A framework for measuring classroom technology use. *Learning and Leading with Technology*, 23(3), 40-41
- Filzah, Mohd Isa. (2007). *Change management initiatives and change success in direct selling industry: The moderating effect of attitude toward change*. Unpublished PhD thesis, University Sains Malaysia, Malaysia.
- Mooij, T., & Smeets, E. (2001). Modeling and supporting ICT implementation in secondary schools. *Computers & Education*, 36(3), 265-281.
- Moore, M. G. (1989). Three types of interaction. *American Journal of Distance Education*, 3(2), 1-6.
- Moore, A. G. (1991). *Crossing the chasm*. New York: Harper Collins Publishers.
- Morales, B. (1998). *Attitudes toward computers among students and teachers in Mexico*. Available: <http://129.120.113.30/research/site99/mexico.htm> [Retrieved April 21, 2000].
- Mulhim, K. (2003). *The impact of using computes on the achievement of the seventh grade students in recitation and intonation subject compared to the ordinary teaching method in Jordan*. M.E thesis, University of Al-Ghasher, Sudan.
- Mumtaz, S. (2000). Factors affecting teacher's use of information and communication technology: A review of the literature. *Journal of Information Technology for Teacher Education*, 9(3), 319-341.
- Naddaf, S. (2002). *Using computers and the internet in private schools in Jordan*. Unpublished M. E. thesis, University of Jordan.
- Nelson, L. J., & Cooper, J. (1997). Gender differences in children's reactions to success and failure with computers. *Computer in Human Behavior*, 13(2), 247-267.
- Newhouse, C. P. (2001). Applying the concerns-based adoption model to research on computers in classrooms. *Journal of Research on Technology in Education*, 33(5). Retrieved March 9, 2005, from http://www.iste.org/inhouse/publications/jrte/33/5/newhouse.cfm?Section=JRTE_33_5.

- Najjar, N. (2006). *Constructing item bank of computer skills for secondary school stage using item response theory models (on parameter & two parameter: comparison study)*. PhD thesis, Al-Yarmouk University, Jordan.
- Office of Technology Assessment, US. Congress. (1995). *Teacher and technology: Making the connection* [OTA-HER-6 161. Washington, DC: U.S. Government Printing Office.
- Okebukola, P. A. (1993). The gender factor in computer anxiety and interest among some Australian high school students. *Educational Research*, 35(2), 181-189.
- Painter, S. R. (2001). Issues in the observation and evaluation of technology integration in K-12 classrooms. *Journal of Computing in Teacher Education*, 17(4), 21-25.
- Pallant, J. (2006). *A step by step guide to data analysis using SPSS for Windows (version 12)*. Buckingham, Philadelphia: Open University Press.
- Papert, S. (1987). Computer criticism vs. technocentric thinking. *Educational Researcher*, 16(1), 22-30.
- Papert, S. (1992). *The Children's Machine*. New York: Basic Books.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods (3rd ed.)*. Thousand Oaks, CA: Sage Publications, Inc.
- Pea, R. (1984). On the cognitive effects of learning computer programming. *New Ideas in Psychology*, 2(2), 137-168.
- Pea, R. (1987). The aims of software criticism: Reply to professor Papert. *Educational Researcher*, 16(5), 4-8.
- Pelgrum, W. J., & Anderson, R. A. (Eds.). (1999). *ICT and the emerging paradigm for life long learning: A worldwide educational assessment of infrastructure, goals and practices*. Amsterdam: International Association for the Evaluation of Educational Achievement.
- Pope-Davis, D. B., & Twing, J. S. (1991). The effects of the age, gender, and experience on measure of attitude regarding computers. *Computer in Human Behavior*, 7, 333-339.
- Prater, D., & MacNeil, A. J. (2001). *The uses of computers for instruction in the classroom: A comparison of teachers' and principals' perceptions*. Proceedings of the Society for Information Technology and Teacher Education (SITE) 12th Annual Conference (Association for the Advancement of Computing in Education), Orlando, FL, [CD], 2383-2389.
- Singh, R. (2003). *Incorporation of internet in teacher training college in Klang Valley*. PhD thesis, University Malay, Malaysia.

- Rakes, G. C., & Casey, H. B. (2002). An analysis of teacher concerns toward instructional technology. *International Journal of Educational Technology*, 3 (1). Retrieved October 26, 2003, from <http://www.ao.uiuc.edu/ijet/v3n1/rakes/index.html>
- Resnick, M., & Rusk, N. (1996). The computer clubhouse: Preparing for life in a digital world. *IBM Systems Journal*, 35(3-4), 431-440.
- Reznich, C. (1996). Applying minimalist design principles to the problem of computer anxiety. *Computer in Human Behavior*, 12(2), 245-261
- Rice, R. E., & Aydin, C. (1991). Attitude toward new organizational technology: Network proximity as a mechanism for social information processing. *Administrative Science Quarterly*, 36(2), 219-244
- Richardson, V. (1997). *Constructivist teaching and teacher education: Theory and practice*. Washington, DC: Falmer Press.
- Rieber, L. P., & Welliver, P. W. (1989). Infusing educational technology into mainstream educational computing. *International Journal of Instructional Media*, 16(1), 21-32.
- Ritchie, D. C. (1996). The administrative role in the integration of technology. *NASSP Bulletin*, 80, 42-52.
- Rogers, M. E. (2003). *Diffusion of innovations (5th ed)*. New York: The Free Press.
- Rogers, M. E. (1995). *Diffusion of innovations (4th ed)*. New York: The Free Press.
- Rogers, M. E. (1983). *Diffusion of innovations (2nd ed)*. New York: The Free Press.
- Rogers, P. L. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research*, 22(4), 455-472.
- Sahin, I., & Thompson, A. (2006). Using Rogers' theory to interpret instructional computer use by COE faculty. *Journal of Research on Technology in Education*, 39 (1), 81-104.
- Sam, H. K., Othman, A. E. A., & Nordin, Z. S.(2005). Computer self-efficacy, computer anxiety, and attitudes toward the internet: A study among undergraduates in Unimas. *Educational Technology & Society*, 8(4), 205-219.
- Samuel, R. J., Zaitun, A. B. (2006). The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat District, Malaysia. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2 (2), 414.

- Samuel, R. J., Zaitun, A. B. (2007). Do teachers have adequate ICT resources and the right ICT skills in integrating ICT tool in the teaching and learning of English language in Malaysian schools? *EJISDC*, 29(2), 1-15.
- Siann, G., Macleod, H., Glissov, P., & Durndell, A. (1990). The effect of computer use on gender differences in attitudes to computers. *Computers in Education*, 14(2), 183-191.
- Schiller, J. (1999). School leaders' competencies in using information technologies. *The International Principle*, 5(2), 13-15.
- Sekaran, U. (2003). *Research methods for business: A skill-building approach* (4th ed). New York: John Wiley & Sons, Inc
- Sharma, S., Durand, R. M., & Gur-Arie, O. (1981). Identification and analysis of moderator variables. *Journal of Marketing Research*, 18(3), 291-300.
- Sharp, C. (1995). *Viewing, listening and learning: The use and impact of schools broadcasts*. Slough: NFER/BBC.
- Sheingold, K., & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Bank Street College of Education, Center for Technology in Education.
- 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).
- Soloway, E., Jackson, S. L., Klein, J., Quintana, C., Reed, J., Spitulnik, J., Stratford, S. J., Studer, S., Jul, S., Eng, J., & Scala, N. (1996). *Learning theory in practice: Case studies of learner-centered design*. Paper presented at the Proceedings of the ACM Conference on Human Factors in Computing Systems, Vancouver, Canada.
- Spotts, T. H. (1999). Discriminating factors in faculty use of instructional technology in higher education. *Educational Technology and Society*, 2(4), 92-99.
- Spotts, T. H., & Bowman, M. A. (1995). Faculty use of instructional technologies in higher education. *Educational Technology*, 35, 56-64.
- Stevens, D. J. (1980). How educators perceive computers in the classroom. *AEDS Journal*, 13(3), 221-232.
- Stoddard, T., & Niederhauser, D. (1993). Technology and educational change. *Computers in the Schools*, 9(2/3) 5-19.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park: Sage Publications.

- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.
- Tam, M. (2000). Constructivism, instructional design, and technology: Implication for transformation distance learning. *Educational Technology and Society*, 3(2), 50-60.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology – Combining qualitative and quantitative approaches*. Thousand Oaks: Sage Publications.
- Taylor, R. P. (1980). *Introduction*. In R. P. Taylor (Ed.), *The computer in school: Tutor, tool, tutee* (pp. 1-10). New York: Teachers College Press
- Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, 24(4), 413-424
- Thomas, L. G., & Knezek, D. (1991). Facilitating restructured learning experiences with technology. *The Computing Teacher*, 18(6), 49-53.
- Torkzadeh, G., & Koufteros, X. (1994). Factorial validity of a computer self – efficacy scale and the impact of computer training. *Education and Psychological Measurement*, 54(3), 813-821.
- Turkmen, H. (2006). Exploring Turkish Science education faculties' understanding of educational technology and use. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 1(2), 6981.
- Vaezi, Z. (2008). Language learning motivation among Iranian undergraduate students. *World Applied Sciences Journal*, 5(1), 54-61.
- Vanden Berg, R., Slegers, P., Geijsel, F., & Vandenberghe, R. (2000). Implementation of an innovation: Meeting the concerns of teachers. *Studies in Educational Evaluation*, 26, 331-350
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.
- Waggoner, M. (1994). Disciplinary differences and the integration of technology into teaching. *Journal of Information Technology for Teacher Education*, 3(2), 175-186.
- Walker, D. F. (1987). Logo needs research: A response to professor Papert's paper. *Educational Researcher*, 16(5), 9-11.
- Watson, D. M. (2001). Pedagogy before technology: Re-thinking the relationship between ICT and teaching. *Education and Information Technologies*, 6(4), 251-266.

- Wetzel, D. (2002). A model for pedagogical and curricular transformation with technology. *Journal of Computing in Teacher Education*, 18(2), 43-49.
- Williams, Michael, D. (2000). *Integrating technology into teaching and learning*. Singapore: Prentice Hall.
- Winnans, C., & Brown, D. S. (1992). Some factors affecting elementary teachers' use of the computer. *Computers in Education*, 18, 301-309.
- Woo, K. (2003). *The adoption, diffusion and use of ICT in instruction in pilot smart schools a case study*. PhD thesis, University Malay, Malaysia.
- Woodrow, J. J. (1991). A comparison of four computer attitude scales. *Journal of Education and Computing Research*, 7(2), 165-187.
- Yalin. H. I., Karadeniz. S., Sahin. S. (2007). Barriers to information and communication technologies into elementary schools in Turkey. *Journal of Applied Sciences*, 7(4), 4036-4039.
- Yamane, T. (1967). *Statistics, an introductory analysis (2nd ed)*. New York: Harper and Row.
- Yang, S., & Huang, Y. (2008). A study of high school English teachers' behavior, concerns and beliefs in integrating information technology into English instruction. *Computers in Human Behavior*, 24(3), 1085-1103.
- Yazid, I. (2000). *Adoption of information technology: Computer application among Malaysian civil service employees in selected agriculture organization*. PhD thesis, University Putra Malaysia, Malaysia.
- Yildirim, S. (2000). Effects of an educational computing course on preservice and inservice teachers: A discussion and analysis of attitudes and use [Electronic version]. *Journal of Research on Computing in Education*, 32(4), 479-497.
- Zayim, N., Yildirim, S., Saka, O. (2006). Technology adoption of medical faculty in teaching: Differentiating factors in adopter categories. *Educational Technology & Society*, 9(2), 213-222.
- Zhang, Y., & Espinoza, S. (1998). Relationships among computer self-efficacy, attitudes toward computers, and desirability of learning computing skills. *Journal of Research on Technology in Education*, 30 (4), 420-436.
- Zhao, Y., & Cziko, G. A. (2001). Teacher adoption of technology: A perceptual control theory perspective. *Journal of Technology and Teacher Education*, 9(1), 5-30.