ADNAN ABD RASHID

The Utilization of Information and Communication Technology among Islamic Secondary School Teachers in Malaysia

ABSTRACT

Malaysia has implemented the first computer system in 1966. Since then, the government – through Ministry of Education – has introduced various initiatives to facilitate the adoption and diffusion of Information and Communication Technology (ICT). In line with the Vision 2020, Ministry of Education has draft ways so as to integrate ICT into education system. Malaysian government has invested millions of Ringgit for the usage of ICT in education. The investments include the building of computer labs, supplying of PCs, and related peripherals, training of teachers, and development of instructional material. The research will concentrate on the utilization, self-efficacy, integration, and satisfactory level of the Islamic Religious Secondary School teachers of Malaysia. Although there are only 55 of such schools but these schools are actually a sought after schools by parents due to its capability of producing leaders academically as well as spiritually. The study will deal with issues such as self-efficacy, utilization, and training needs/provided as well as the integration of ICT in teaching and learning. The analysis is adopting principle component analysis to determine the predictors of the underlying variables as well the use of Structural Equation Modeling (SEM) to strengthen the analysis.

Key words: Information and communication technology, K-economy, teachers of Malaysia, and competences in teaching and learning.

INTRODUCTION

Malaysia implemented the first computer system in 1966. Since then, the government – through the Ministry of Education – has introduced various initiatives to facilitate the adoption and diffusion of ICT (Information and Communication Technology). The Ministry of Education Malaysia has also made every possible effort to incorporate ICT in the teaching and learning process in the light of increased demand for education and technology approaches in the classroom.

In the year 2003, Malaysia's K-economy Master Plan was introduced. As part of this programme, the government has promoted the use of ICT as a culture in teaching and learning process. In line with Vision 2020, the Ministry

Assoc. Prof. Dr. Adnan Abd Rashid is Senior Lecturer at the Institute of Education IIUM (International Islamic University of Malaysia), Jalan Gombak, 53100 Kuala Lumpur, Malaysia. He can be reached at: adnan@iiu.edu.my and arashid@isesco.org.ma

of Education has drafted ways to integrate ICT comprehensively into the education system to upgrade teaching and learning in the school environment. The launching of the Smart School Project attempting to automate various schools activities and the inculcation of ICT into the daily education curriculum show the seriousness of the government in adopting ICT in education. Other ICT-related projects such as the training of teachers, school administrators, and school staff was also introduced to develop and enhance the knowledge and skills of the utilization of the computer in them. The building of computer labs in Malaysian primary and secondary schools throughout the country is the second phase of the promotion of ICT in the school system (Chan, 2002).

The race toward the integration of ICT in various sectors such as business, government, medicine, engineering, and education has led to a plethora of research work. Research and literature about the usage of ICT in education has been abundantly produced in the Western world but is scarcely found in Asia. Research by M.B. Eisenberg and J. Dough (2002) concentrate on the efficacy of particular models of IT-mediated instruction, whereas S. Mumtaz (2000) examines faculty the resistance to IT-integration. Meanwhile, Peluchette and Rust focused on the attitudinal outcome of the IT-mediated teaching environment, which included faculty's perceptions, attitudes, and the sense of efficacy in IT use (cited by Cavanagh, Reynolds & Romanoski, 2004). Lynne Schrum, Mary D. Burbank and Rosemary Capps (2007) focused on preparing future teachers for diverse schools in an online learning community: perceptions and practices. Their study provides an example of one institution's efforts to design coursework that meets the simultaneous challenges of supporting the aims of increasing access to online courses and simultaneously better preparing teachers to work in diverse classrooms.

The school environment studied by Aiden Mulkeen was studying the impact of teacher skills on integration of ICT in Irish Schools (cited by Schrum, Burbank & Capps, 2007). R.F. Cavanagh, P.S. Reynolds and J.T. Romanoski (2004) went further as they studied the ICT learning in the classroom and its influence on the student, class-group, teachers, and home. Hossein Arsham (n.d.) noted that ICT "*provides the means for fundamentally changing the way in which instruction is delivered to students*". To him, "*using advantages of this technology to expand learning opportunities is particularly crucial, because we live in a time when learning is becoming a necessity not a luxury*" (Arsham, n.d.).

According to Gary B. Shelly, J.C. Thomas and E.V. Misty (2007), the use of the computer is of vital importance in all sectors of life, for example to access information from around the globe, to manage house activities and schedules, and to assist classroom instruction, where teacher and students can do their work at school or at home. Nowadays, ICT is becoming more a part of the educational institution culture and everyday life learning activities. However, rapid technological approaches in the workplace, particularly in the classroom environment, may produce problems and challenges when sometimes there

are shortages of manpower skilled in utilizing ICT in their work activities or teaching processes.

In the light of the preceding literatures, this study specifically aimed to examine the extent to which a locally constructed measurement of IT (Information Technology) use, self-efficacy, training needs and adequacy, and satisfaction of the school teachers and administrators. The research concentrates on fully sponsored government religious schools, also known as SMKA (*Sekolah Menengah Kebangsaan Agama* or Religious State Secondary School).

The Ministry of Education established the SMKA in 1977 in order to introduce an integrated educational system where the normal/modern subjects and Islamic studies were taught. There exist 55 of this type of schools throughout Malaysia which are aiming to enable students to achieve a good balance in their knowledge as well as their personality. The environment of these schools is unique, whereby additional subjects are taught and special emphasis is given to subjects such as Arabic language and Islamic studies subjects, it is interesting to find out the level of ICT integration in these schools.

The analysis of the data of the study was initially done by way of Principal Component Analysis and by later empirically validating the correlation by way of the Structured Equation Modeling technique.

METHOD

The teachers' sample, which is described earlier, consisted of 106 secondary school teachers. Although there were 300 questionnaires distributed, only 106 were returned. All 300 questionnaires were distributed to the 55 schools throughout Malaysia. Authorization from the Ministry of Education was sought and obtained. There are 37 items on the usage of ICT (Information and Communication Technology) and other related dimensions and 11 demographic questions.

The purpose of the study is mainly to find out the SMKA (*Sekolah Menengah Kebangsaan Agama* or Religious State Secondary School) teachers' degree of utilization, their self-efficacy of using ICT, satisfaction, usage and training needs as well as training adequacy when using ICT at their schools in their everyday routine. The study managed to gather 106 samples only from the 300 questionnaires distributed. They were sent to all the 55 SMKA schools in Malaysia with the help of Department of Islamic and Moral Education (*Jabatan Pendidikan Islam dan Moral*), Ministry of Education.

The data were collected using 5 main themes, where each item has sub-items. All the items were constructed using 7-point Likert Scale which indicate point 1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neutral, 5 = Somewhat Agree, 6 = Agree, and 7 = Strongly Agree respectively. The methodology of the research is by way of survey questionnaires comprising 37 items coupled with some demographic data.

Path analysis was used in this study to validate a model of the teacher's use of IT (Information Technology). Specifically, it tested the effects of teachers' sense of efficacy, skills in using internet and computer peripherals. The analysis utilized SEM (Structured Equation Modeling) software AMOS to apply the path analysis where the sample of 106 underwent confirmatory factor analysis.

ANALYSIS

The study underwent a factor analysis which is a data reduction technique to reduce a large number of variables to a smaller set of underlying factors which summarizes the essential information contained in the variable. Three tests were conducted, namely: principal component factor extraction, rotation, and computation of correlation matrix. Upon further analysis, using factor analysis the following dominant factors were found: (1) Self efficacy, (2) ICT usage, (3) Satisfaction level, (4) ICT integration in the curriculum, and (5) Training adequacy and needs.

The analysis used is Principal Component Analysis (PCA) where "varimax rotation" was conducted to determine the construct validity of the data collected from school administrators. The analysis adopted an exploratory approach where no assumed structure is to be confirmed.

To identify the underlying dimensions by the variables, the factors analysis was conducted on the inter-variable correlations matrix. This is a data reduction technique used to determine if there is a smaller number of underlying dimensions which account for the major sources of variation in the samples' responses.

In assessing assumptions for correlated variables in the initial solution, three tests were conducted. *First*, for Bartlett's Test for Sphericity, it was found that χ^2 (106) = 3768.9, p =.001. The result shows statistically significant correlation among items.

Second, the overall Keiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.737, demonstrating that the sample was sufficient to support PCA and since it is greater than 0.7, it shows that there was good correlation among the items.

Table 1:
KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.737
Bartlett's Test of Sphericity	Approx. Chi-Square	3768.936
	df	666
	Sig.	.000

Third, the measure of Communality of items (see table 2) indicates that a majority of scores are 0.5 and greater [except item no (1) score at 0.485]. Nevertheless, it can be stated that the results of all the statistical tests above pointed to the appropriateness of using PCA in the study.

Table 2:
Communality

	Initial	Extraction
Q1	1.000	.485
Q2	1.000	.777
Q3	1.000	.556
Q4	1.000	.741
Q5	1.000	.740
Q6	1.000	.728
Q7	1.000	.691
Q8	1.000	.688
Q9	1.000	.790
Q10	1.000	.725
Q11	1.000	.803
Q12	1.000	.842
Q13	1.000	.794
Q14	1.000	.789
Q15	1.000	.788
Q16	1.000	.784
Q17	1.000	.745
Q18	1.000	.775
Q19	1.000	.696
Q20	1.000	.818
Q21	1.000	.502
Q22	1.000	.630
Q23	1.000	.852
Q24	1.000	.855
Q25	1.000	.769
Q26	1.000	.725
Q27	1.000	.823
Q28	1.000	.814
Q29	1.000	.701
Q30	1.000	.677
Q31	1.000	.819
Q32	1.000	.824
Q33	1.000	.847
Q34	1.000	.791
Q35	1.000	.648
Q36	1.000	.650
Q37	1.000	.639

Extraction Method: PCA (Principal Component Analysis).

Although there are 18 factors with eigenvalues greater than or equal to one, only 6 main factors were considered for further analysis. Other factors/ components were not considered due to the lack of number of items (minimum

of 4 items) which is a criterion for exploratory factor analysis. Theses 6 factors derived accounted for 67% of the total variance explained. These six factors generated were retained for further analysis.

The *first factor* is labeled as "Self-Efficacy", while *the second factor* is labeled as "Satisfaction". The *third factor* was named "ICT Integration", the *fourth factor* as "ICT Use", the *fifth factor* as "Training Adequacy", and, finally, the *sixth factor* is labeled "Training Needs". These six factors consist of 33 items altogether which were retained for further analysis which accounted for a modest 64.2% of the total variance explained.

The first rotated factor comprises seven items, which account for 15.7% of the variance explained. This variable was intended to draw information about *the significance of teachers' confidence level and belief in their level of competencies in using ICT*. The items in this factor were focused on the teachers' confidence level of their own skills and competency in ICT. The items in this factor are as follows:

> The *first factor* of "Self-Efficacy", the teachers believe that: (1) *I am confident that I am able to learn to use the computer;* (2) *I have the skill to use the computer for my teaching tasks;* (3) *I am certain that technology can help me in my daily tasks;* (4) *I am sure that I have adequate knowledge in ICT;* (5) *I have a strong commitment to utilize the knowledge of computers;* (6) *I believe that I am able to master the skill of using the computer over time;* and (7) *I expect myself to be competent in using ICT.*

The *second factor* which is labeled as "Satisfaction" consists of six items, which account for 12.9% of the variance. In this item, the main concern in this factor is the level of teachers' satisfaction with regard to the hardware, software, infrastructure, and support. In this study, the level of satisfaction is translated in the items listed below:

> The *second factor* of "ICT Satisfaction", the teachers believe that: (1) *I am satisfied with the hardware facility in the schools;* (2) *I am satisfied with the other peripherals such as printers, scanners, and LCD projectors;* (3) *The internet connectivity at my school is at a satisfactory level;* (4) *I am satisfied with the training provided by the schools and the Ministry;* (5) *I am satisfied with the technical support given by the school;* and (6) *I am satisfied with the computer speed, memory and hard-disk capacity.*

The *third factor* is labeled as "ICT integration" in teaching and learning. The items in the questionnaires aim to find out whether they are able to integrate ICT into their teaching and learning process. This *third factor* carries 12.5% of the variance explained. Among the questions asked are the following:

> The *third factor* of "ICT Integration", the teachers believe that: (1) *I use a LCD projector, power point, and other computer peripherals in my teaching process;* (2) *I use computers in my teaching in the classroom;* (3) *I use ICT to find information to enhance my teaching;* (4) *I integrate my teaching by using computer peripherals such as CDs and projectors;* and (5) *ICT integration is necessary to motivate students to learn.*

The *fourth factor*, which is labeled, as "ICT Use" consists of five items, which account for 8.2% of the variance explained. These items intend to measure the level of usage of ICT in their daily routine. In this study, ICT usage is translated in the items listed below:

> The *fourth factor* of "ICT Use", the teachers believe that: (1) *I frequently use the computer in my daily task;* (2) *I usually use computer applications such as Microsoft Word, Excel, or Power Point;* (3) *I use computer peripherals such as printers, thumb drives, scanners, and digital cameras;* (4) *I use the internet to search for information using search engines like yahoo or google;* and (5) *I often use the Internet to check on email, news, question banks, and other educational materials.*

The *fifth factor* is labeled as "ICT Training Adequacy". The items in the questionnaire aim to find out whether the training provided by the Ministry of Education and the Department of Education is adequate for teachers to learn ICT. This *fifth factor* carries 8.0% of the variance explained. Among the questions asked are the following:

> The *fifth factor* of "ICT Training Adequacy", the teachers believe that: (1) *Training done by the schools is adequate for me;* (2) *Training provided by the Ministry of Education is adequate;* (3) *I was given ICT training by the school administration;* and (4) *Training provided by my school is enough to get me to use computers.*

The *sixth*, and final, *factor* which is labeled as "ICT Training Needs Analysis" consists of four items, which account for 6.9% of the variance explained. These items intend to measure the ICT training needs of the teachers in terms of quality, quantity and continuous training availability. In this study, the lCT training needs analysis is translated in the items listed below:

> The *sixth factor* of "ICT Training Needs Analysis", the teachers believe that: (1) *I need more training in software applications such as MS Office and Animation;* (2) *Time allocated for training should be more than presently implemented;* (3) *Teachers should have continuous ICT training for better integration in education;* and (4) *Training is an important aspect in successful ICT integration in teaching and learning.*

The details of the rotated component matrix are shown below:

Rotated Component Matrix(a)

	Component						
	1	2	3	4	5	6	7
Q1							
Q2	.722						
Q3				.542			
Q4	.779						
Q5	.768						
Q6	.621						
Q7	.627						
Q8	.705						

	Component						
	1	2	3	4	5	6	7
Q9	.720						
Q10	.717						
Q11					.649		
Q12					.669		
Q13					.651		
Q14					.564		
Q15			.812				
Q16		.859					
Q17		.829					
Q18		.847					
Q19		.664					
Q20						.534	
Q21		.589					
Q22		.695					
Q23						.749	
Q24						.761	
Q25						.784	
Q26							.416
Q27							.833
Q28							.861
Q29							.437
Q30							
Q31			.813				
Q32			.771				
Q33			.850				
Q34			.738				
Q35					.642		
Q36				.685			
Q37				.719			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
A Rotation converged in 10 iterations.

In order to test the validity of those factors, Crombach alpha was tested for all the items contained in a particular factor. "Crombach's alpha" is the most common form of internal consistency reliability coefficient. By convention, a lenient cut-off of .60 is common in exploratory research. The *first factor* which was named "Self-Efficacy" has an alpha reading of 0.93; the *second factor* which is labeled as "Satisfaction" has an alpha reading of 0.88; the *third factor* which is labeled as "ICT Integration" has an alpha reading of 0.94; the *fourth factor* which is labeled as "ICT Usage" has an alpha reading of 0.90; the *fifth factor* which is labeled as "ICT Training Adequacy" has an alpha reading of 0.90; and, finally, the *sixth factor* which is labeled as "ICT Training Needs Analysis" has an alpha reading of 0.77.

Based on the convention, all 6 factors are statistically reliable to be named as factors to be considered in this research. The details of the SPSS output are as follows:

Factor 1: Self Efficacy
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q2	39.0094	45.4380	.7725	.9215
Q4	39.1981	46.9223	.7418	.9237
Q5	38.8491	43.7103	.8203	.9179
Q6	38.1038	49.4272	.6904	.9277
Q7	38.1226	49.8229	.7328	.9259
Q8	38.3868	45.4394	.7560	.9229
Q9	38.4906	43.1856	.8400	.9163
Q10	37.9717	46.3325	.7803	.9209

Reliability Coefficients
N of Cases = 106.0 N of Items = 8
Alpha = .9313

Factor 2: Satisfaction
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q16	23.0472	29.9501	.7093	.8552
Q17	22.9245	30.5847	.7387	.8496
Q18	23.3585	29.5084	.7584	.8459
Q19	23.0377	32.4557	.6614	.8627
Q21	23.4623	33.7557	.5589	.8786
Q22	23.4151	32.9499	.7076	.8569

Reliability Coefficients
N of Cases = 106.0 N of Items = 6
Alpha = .8793

Factor 3: ICT Integration
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q15	20.2667	26.4859	.7905	.9275
Q31	20.2000	25.6808	.8326	.9198
Q32	20.1905	25.3288	.8615	.9145
Q33	20.4476	23.5381	.8675	.9141
Q34	20.0762	26.3980	.7952	.9267

Reliability Coefficients
N of Cases = 105.0 N of Items = 5
Alpha = .9355

Factor 4: ICT Use
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q11	19.0377	24.8176	.8339	.8586
Q12	19.2547	23.7726	.8860	.8458
Q13	19.8868	23.6252	.8331	.8587
Q14	18.6887	26.7117	.7331	.8813
Q35	19.8868	31.6061	.4793	.9272

Reliability Coefficients
N of Cases = 106.0 N of Items = 5
Alpha = .8996

Factor 5: ICT Training Adequacy
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q20	13.2264	13.2435	.7138	.8991
Q23	13.8113	11.4688	.8487	.8506

Q24	13.6415	11.3941	.8595	.8465
Q25	13.6604	12.4359	.7182	.8988

Reliability Coefficients
N of Cases = 106.0 N of Items = 4
Alpha = .9034

Factor 6: ICT Training Needs Analysis
Item-Total Statistics
RELIABILITY ANALYSIS – SCALE (ALPHA)
Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Q27 16.5472	7.0311	.6241	.6838
Q28 16.7075	6.3613	.6881	.6449
Q29 15.3868	7.9918	.5504	.7239
Q30 15.1792	9.5199	.4450	.7741

Reliability Coefficients
N of Cases = 106.0 N of Items = 4
Alpha = .7690

The analysis went further in computing the correlation analysis using the factors in SPSS and the results are as follows:

Correlations

		EFFICACY	SATISFY	INTEGRAT	USE	T_ADEQU	T_NEEDS
EFFICACY	Pearson Correlation	1	.213(*)	.574(**)	.656(**)	.171	.486(**)
	Sig. (2-tailed)	.	.028	.000	.000	.080	.000
	N	106	106	106	106	106	106
SATISFY	Pearson Correlation	.213(*)	1	.295(**)	.343(**)	.651(**)	.065
	Sig. (2-tailed)	.028	.	.002	.000	.000	.508
	N	106	106	106	106	106	106
INTEGRAT	Pearson Correlation	.574(**)	.295(**)	1	.569(**)	.433(**)	.275(**)
	Sig. (2-tailed)	.000	.002	.	.000	.000	.004
	N	106	106	106	106	106	106
USE	Pearson Correlation	.656(**)	.343(**)	.569(**)	1	.331(**)	.440(**)
	Sig. (2-tailed)	.000	.000	.000	.	.001	.000
	N	106	106	106	106	106	106
T_ADEQU	Pearson Correlation	.171	.651(**)	.433(**)	.331(**)	1	-.103

	Sig. (2-tailed)	.080	.000	.000	.001	.	.294
	N	106	106	106	106	106	106
T_NEEDS	Pearson Correlation	.486(**)	.065	.275(**)	.440(**)	-.103	1
	Sig. (2-tailed)	.000	.508	.004	.000	.294	.
	N	106	106	106	106	106	106

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

This correlation matrix gives the result that self-efficacy is related to satisfaction, ICT integration, ICT use, and training needs.

STRUCTURED EQUATION MODELLING

The result extracted from the factor analysis gives us some indication of how the model would look. The path analysis is used by using the AMOS data-fitting program (Arbuckle & Wothke, 1999) to support the relationships. The study takes the approach of Confirmatory Factor Analysis confirming the Principal Component Analysis.

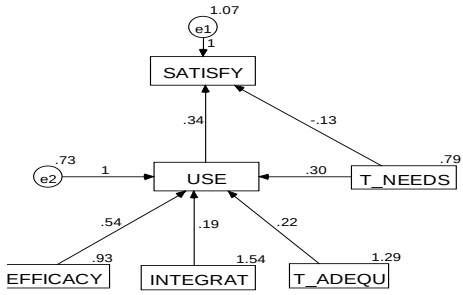

Figure 1:
Relationship between ICT Use, Satisfaction, Self-Efficacy, ICT Integration, Training Adequacy, and Training Needs

On the ICT Use and Satisfaction. Specifically, the analysis found that statistically significant path coefficients, implying the following causal links: (1) *Teachers' self-efficacy has a direct impact on the usage of the ICT facilities*. However, it has an indirect impact on the satisfaction level through the usage of ICT facilities; (2) *Teachers' ICT integration in the teaching and learning process has a direct impact on the usage of the ICT facilities*. However, it has an indirect impact on the satisfaction level through the usage of ICT facilities; (3) *Teachers' training adequacy has a direct impact on the usage of the ICT facilities*. However, it has an indirect impact on the satisfaction level through the usage of ICT facilities; (4) *Teachers' training needs have a direct impact on the usage of the ICT facilities*.

However, they have an indirect impact on the satisfaction level through the usage of ICT facilities; (5) *The ICT usage also has an effect on the satisfactory level of the ICT facilities provided to them*; and (6) *The study takes into account the teachers' training needs and has found a negative impact between training needs and satisfaction*. This can be explained in that the higher the training needs and the less they are satisfied, the more they would like to acquire more ICT training.

CONCLUSION

The results of the study offered adequate representation of a commonality in meaning shared by the items; there is ample support for construct-related validity of teachers' use of ICT (Information and Communication Technology), their satisfaction level, their self efficacy as well as the training needs and adequacy. The calibrated items would be useful as they give an explanation of the underlying factors that influence their usage and their training needs. Finally, the findings contribute to the explanation of teachers' usage, their self-efficacy, integration and training needs as well as their satisfactory level when it comes to ICT in the school environment.

Bibliography

Arbuckle, J. & L. Wothke. (1999). *AMOS Users' Guide Version 4.0*. Chicago, IL: Small Waters Corporation.

Arsham, Hossein. (n.d.). *Impact of the Internet on Learning and Teaching*. Baltimore, USA: The University of Baltimore. Also available at http://ubmail.ubalt.edu/~harsham [accessed in Kuala Lumpur, Malaysia: 9 October 2011].

Cavanagh, R.F., P.S. Reynolds & J.T. Romanoski. (2004). *Information and Communication Technology Learning in the Classroom: The Influence of Students, the Class-Group, Teachers, and the Home*. Canberra, Australia: Australian Research Council, Curtin University of Technology, Department of Education.

Chan, Foong-Mae. (2002). *ICT in Malaysian Schools: Policy and Strategies*. Kuala Lumpur, Malaysia: Educational Technology Division, Ministry of Education.

Eisenberg, M.B. & J. Dough. (2002). "Learning and Teaching Information Technology: Computer Skills in Context" in *ERIC Digest* [On-line].

Marzuki, A.M. *et al*. (2005). *Faculty's Satisfaction and Sense of Efficacy in the Use of Information Technology*. Kuala Lumpur, Malaysia: IUUM [International Islamic University of Malaysia].

Mumtaz, S. (2000). "Factors Affecting Teachers' Use of Information and Communication Technology: A Review of Literature" in *Journal of Information Technology for Teacher Education*, 9(3), pp.319-341.

Rigdon, E.E. (1996). "CFI Versus RMSEA: A Comparison for Two Fit Indices for Structural Equation Modeling" in *Journal of Information Technology for Teacher Education*, 3(4), pp.369-379.

Schrum, Lynne, Mary D. Burbank & Rosemary Capps. (2007). "Preparing Future Teachers for Diverse Schools in an Online Learning Community: Perceptions and Practice" in *The Internet and Higher Education*, 10, pp.204-211.

Shelly, Gary B., J.C. Thomas & E.V. Misty. (2007). *Discovering Computers 2007: A Gateway to Information*. New York, USA: Thomson Course Technology.

In line with the Vision 2020, Ministry of Education has draft ways so as to integrate ICT into education system. Malaysian government, through its Ministry of Education, has invested millions of Ringgit for the usage of ICT in education.