RELATIONSHIP BETWEEN TEACHERS' ICT COMPETENCY, CONFIDENCE LEVEL, AND SATISFACTION TOWARD ICT TRAINING PROGRAMMES: A CASE STUDY AMONG POSTGRADUATE STUDENTS

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ABSTRACT
There are three main variables that would make the integration of ICT tools as an easy process. Those three variables are teachers' ICT competency, teachers' confidence level in using ICT, and teachers' satisfaction on ICT training programmes. This study investigated the relationships among these three variables and measured the levels of the correlation among them. In order to do that, this study used questionnaire method to collect the needed data from the teachers. The targeted sample was the postgraduate students, who are currently teachers in Malaysian schools, from Faculty of Education in one of the universities located in Johor State. A total of 184 questionnaires have been collected and analyzed. This research finding revealed that Malaysian teachers had a high level of ICT competency (mean = 3.95), confidence level in using ICT (mean = 4.01), and satisfaction towards ICT training programmes (mean = 4.02). The findings also showed that the correlation coefficient between teachers' ICT competency and teachers' confidence level in using ICT was high (r = .749). However, both correlation coefficients between teachers' ICT competency (r = .496) and teachers' confidence level in using ICT (r = .571) with teachers' satisfaction toward ICT training programmes were moderate.

INTRODUCTION
Information technology aims to improve students' performance by the intelligent application of technology and hopes this will increase the effectiveness and efficiency of teaching and learning process. There is now an irreversible trend among countries in Asia and the Pacific to transform their teaching force and educational staff into technology literate and skilled workers. In almost all countries in the region, including emerging countries, teachers in primary, secondary and tertiary levels are being trained in the use of information and communication technologies (ICTs) in education with varying degree and scope (UNESCO, 2003). It was observed that an increasing number of countries are now undertaking training to develop skills in the use of ICT in teaching and other school activities, including classroom management, to ensure the teachers bring their skills to actual classroom teaching. For example, Malaysian teacher training objectives are all directed towards developing the skills of teachers to use ICT in teaching in Malaysian schools.

The number of teachers being trained varies greatly from country to country. Inventoried programmes have reported having trained huge number of teachers, especially in those countries which have had a long history of training, are more financially endowed, and are more advanced in their ICT development. South Korea, for example, reported of having trained all teachers in selected subjects, or a total of 3,897 in-service teachers per year. Intel India has reported of training 230,540 in-service teachers across 35 cities in India and a total of 29,702 per-service teachers. Intel Malaysia has trained over 15,000 teachers to date, while the World Links-sponsored training programmes in India have trained 130,000 teachers. UNESCO (2003) also reported that the duration of training varies from country to country, for instance, Malaysia's Intel sponsored training programmes require 40 hours, whereas, South Korea uses 60 hours/ 30 hours/ 15 hours to measure the length of teacher training programmes.

The importance of ICT training comes from the fact that ICT adds value to the processes of learning, and in the organization and management of learning institutions. The use of ICT also cuts across all aspects of economic and social life. Technological developments in ICT are very rapid. Technology quickly becomes obsolete requiring new skills and knowledge to be mastered frequently. Adaptation is only possible when based on a sound understanding of the principles and concepts of ICT. In other hand, these rapid developments in ICT are difficult to manage by Ministries of Education, educational managers, and schools. Circumstances vary between countries and between schools within a country, and implementation factors have therefore to be taken into account when designing ICT curricula (UNESCO, 2002).

RESEARCH OBJECTIVES
From the prior scenario on the benefits that can be gathered from the good implementation of Information and Communication Technology (ICT). The main objectives of this study are:

i. To identify teacher's ICT competency, teacher's confidence level in using ICT, and teachers' satisfaction toward ICT training programmes.
ii. To examine the relationship between teacher's ICT competency and teacher's confidence level of using ICT and vice versa.
iii. To examine the relationship between teacher's confidence level of ICT and teacher's satisfaction toward ICT training programmes and vice versa.
iv. To examine the relationship between teacher's competency in using ICT and teacher's satisfaction toward ICT training programmes and vice versa.

RESEARCH METHOD

This study investigated the relationship between teacher's competency and teacher's confidence level toward using ICT tools, the relationship between teacher's confidence level and teacher's satisfaction toward ICT training programmes, and the relationship between teacher's competency and teacher's satisfaction toward ICT training programmes. Correlation research investigates the relationships among the various psychological variables (Mark, 2004). The quantitative approach is used for this research because quantitative data is more efficient and able to test the variables. Therefore, this study is considered as a correlation and quantitative study. Questionnaire method has been chosen to carry out a survey, to collect data in this research. The questionnaire has been designed for Malaysian teachers who are postgraduate students in UTM to answer a variety of questions that depict the previous three variables.

This study was conducted out in seven stages. First of all, the problem, objectives, and questions of the research have been identified. Second stage, the literature review and empirical studies that were related to the study had been collected and studied for deeply understanding of the problem and to choose the appropriate method to conduct the study and achieve its objectives. Third stage, the questionnaire method had been chosen and designed to collect the data needed. Fourth stage, a pilot study had been conducted to test the reliability and the validity of the questionnaire. Fifth stage, the questionnaire had been distributed to the targeted samples and then it had been collected from them. Sixth stage, the data collected had been analyzed using SPSS software. Finally, the findings had been obtained, organized and discussed.

Sampling method

There are two categories of sampling: random sampling and non-random sampling. Random sampling is the process of selecting sample that would be representative of the population of interest (Norazman et al, 2007). In contrast, non-random sampling does not provide an equal chance for every member of the population to be selected as sample in a research. Random sampling has been selected to conduct the survey of this research because in random sampling, every member of the population has an equal probability to be chosen to participate in the research. Another reason is that the results of the research would yield a representative sample (Norazman et al, 2007).

This research has been done in Malaysia. The targeted people in this research are the Malaysian teachers who are postgraduate students in one University located in Johor State. The number of the postgraduate students in the education faculty is 468 students according to the faculty administration office. This consideration has been adopted, so the questionnaire has been delivered to Malaysian students who claim that they are currently teachers in Malaysian schools. James et al (2001) mentioned that the alpha level is used in determining sample size on most educational research studies. He mentioned that t-value for alpha level of .05 is 1.96 for sample sizes above 120 and a sample size of 96 is appropriate when the population is 500. The data has been collected from 184 participants. This means that the sample size of this research exceeded the required number and the data is more accurate.

Instrumentation

Thirty two items of the questionnaire have been used to measure the constructs of this study which are teachers' competency, teachers' confidence level, toward using ICT, and teachers' satisfaction toward ICT training programmes. The measurements in the questionnaire have been designed to fit the purpose of this study. The survey has used Likert scale to examine respondents. Likert scale is the most common instrument used for assessing respondents' opinions of usability (Dumas, 1999).

Reliability and Validity of the Questionnaire

Reliability Analysis

A pilot study has been conducted to establish validity and reliability of the instrument. According to De Vos et al (2002), the purpose of the pilot study is "to improve the success and effectiveness of the investigation". A

total of 19 teachers have been included in the pilot test and they are not repeated in the main sample size. Cronbach alpha reliability coefficient of each item of the questionnaire has been conducted using the reliability analysis with SPSS software. A Cronbach's alpha reliability coefficient (r) normally ranges between 0 and 1 (George and Mallery, 2003).

The survey instrument has been tested by using Cronbach's alpha to check the level of agreement between the various questionnaire items that were used to measure the target variables. According to Moore and Benbasat (1991), the reliability levels are acceptable values for Cronbach's alpha when equal to 0.7 or greater. The calculation indicates that the reliability level for teacher's competency is very high with a value 0.849 for Cronbach's alpha. Also it indicates high levels for both teacher's confidence level and teacher's satisfaction toward ICT training programmes with value 0.878 and 0.908 for Cronbach's alpha sequentially.

Factor Analysis

Factor analysis is a technique for identifying groups or clusters of variables (Field, 2005). It is used to assess construct validity which means the extent to which a scale is an appropriate operational definition of the variable. The analysis was conducted using Principal Component Analysis in SPSS data reduction factor analysis procedure. The results have been analyzed to check for the items which have low correlations with others.

KMO and Anti-Image Test

Another alternative is to use the Kaiser-Meyer-Olkin measure of sampling adequancy (KMO). The KMO can be calculated for individual and multiple variables and represents the ratio of the squared correlation between variables to the squared partial correlation between variables. The KMO statistics varies between 0 and 1. Else, the Anti-image test produces an anti-image matrix of covariance and correlations. These matrices contain measure of sampling adequacy for each variable along the diagonal and the negative of the partial correlation/covariance on the off-diagonals. The diagonal elements, like the KMO, should all greater than 0.5 at a bare minimum if the sample is adequate for a given pair of variables. The off-diagonal elements should all be very small (close to zero) in a good model (Field, 2005).

For the rest of the anti-image correlation matrix, the off-diagonal elements represent the partial correlation between variables. For a good factor analysis, these correlations should to be very small (Field, 2005). For the data of this study, the off-diagonal values are very small. For the data of this study, the value of KMO is .832 which falls into the range of being great. This means that factor analysis is appropriate for this data. Anti-image matrix resulted that all values are very high and above 0.5 (0.84, 0.83, 0.846, 0.722, 0.723, 0.871, 0.819, 0.779, 0913, 0.826, 0.823, 0.71, 0.944, 0.8, 0.7, 0.843, 0.87, 0.769, 0.739, 0.892, 0.91, 0.87, 0.776, 0764, 0.886, 0.896, 0.764, 0.732, 0.793, 0.865, 0.858, and 0.892).

Factor extraction

The first part of the factor extraction is to determine the linear components within the data set by calculating the eigenvalues of the R matrix (Field, 2005). The importance of a particular vector can be determined by looking at the magnitude of the associated eigenvalue. For the data of this study, SPSS listed the eigenvalues associated with each linear component before extraction, after extraction, and after rotation. Before the extraction, 21 linear components have been identified within the data set. The eigenvalues associated with each factor represent the variance explained by that particular linear component (Field, 2005).

For the data of this research and after extraction, seven factors have been left. Factor 1 accounted for considerably more variance than the remaining four (35.17% compared to 10.25, 6.1, 5.78, 4.63, 3.6, and 3.24). Table 1 shows the Component Matrix after deleting the values that are less than 0.4.

The communalities before and after extraction have been calculated using SPSS software. For the data of this study, by Kaiser's criterion, seven factors should be extracted. Both Kaiser's rules are accurate for this study because the sample size is 184 and the average of the communalities is .69 (22.01/32). Figure 1 shows the scree plot with an arrow indicating the point of inflexion on the curve. It is noticeable that the curve begins to tail off after four factors, and it is clear that the stable plateau is after five factors.

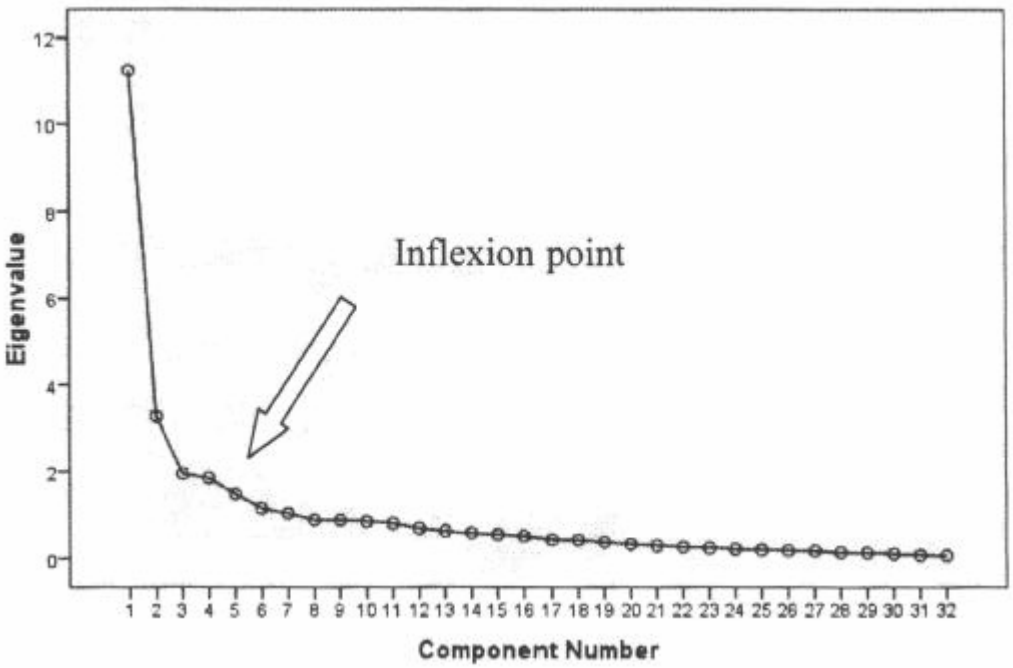

Figure 1: Scree plot

Table 1 shows the seven factors extracted and their components. The first factor which explains 35.17% and consists of a combination of the main three constructs which are teacher's competency, teacher's confidence level, and teacher's satisfaction toward ICT training programmes. This means that these three constructs are the most important factors. The other six factors have the lower impact.

Table 1: Component matrix

	Component						
	1	2	3	4	5	6	7
TC1	.604						
TC2	.649						
TC3	.585						
TC4	.455		.507	.478			
TC5	.436		.522	.538			
TC6	.621						
TC7	.448						
TC8	.650						
TC9	.646						
CL1	.649						
CL2	.666	.405					
CL3	.547	.429					
CL4	.681						
CL5	.642						
CL6	.529						
CL7	.573						
CL8	.557						
CL9	.570					.532	
CL10	.503						.505
CL11	.657						
TS1	.692						
TS2	.526						
TS3	.564						
TS4	.632						
TS5	.629						
TS6	.708						
TS7	.615						
TS8	.504			.448			

TS9	.582						
TS10	.532						
TS11	.609						
TS12	.586						

Extraction method: Principal component analysis; 7 components extracted

*TC = Teachers' Competency; CL = Teachers' Confidence Level; ST=Teachers' Satisfaction of ICT Training

DATA ANALYSIS

To identify the level of teacher's ICT competency; teacher's confidence level in using ICT; and teacher's satisfaction toward ICT training programmes, descriptive statistics such as mean and standard deviation were used. This study also has used a bivariate correlation to measure the extent of the relationships between the three variables (teacher's ICT competency, teacher's confidence level in using ICT, and teacher's satisfaction toward ICT training programmes). Pearson's product-moment correlation coefficient has been conducted for the bivariate correlation analysis. In order to obtain a good interpretation of these relationships, the correlation coefficient squared (R2) has been used. R2 is a measure of the amount of variability in one variable that is explained by the other (Field, 2005).

FINDINGS

The results of the descriptive analyses explain that Malaysian teachers have a high level of competency (nearly 4), they have a high level of confidence to use ICT (nearly 4), and they have a high level of satisfaction toward ICT training programmes (nearly 4). Table 2 shows the mean and standard deviation for the three variables.

Table 2: The Mean and Standard Deviation

	Mean TC	Mean CL	Mean TS
Valid	184	184	184
N Missing	0	0	0
Mean	3.9511	4.0069	4.0199
Std. Deviation	.63107	.51562	.555645

*TC = Teachers' Competency; CL = Teachers' Confidence Level; ST=Teachers' Satisfaction of ICT Training

Correlation Analysis

Table 3 shows the correlation analysis among the three variables which are teacher's competency, teacher's confidence level, and teacher's satisfaction toward ICT training programmes.

Table 3: Correlations

		Mean TC	Mean CL	Mean TS
Mean TC	Pearson Correlation	1.000	.749**	.496**
	Sig. (2-tailed)		.000	.000
	N	184.000	184	184
Mean CL	Pearson Correlation	.749**	1.000	.571**
	Sig. (2-tailed)	.000		.000
	N	184	184.000	184
Mean TS	Pearson Correlation	.496**	.571**	1.000
	Sig. (2-tailed)	.000	.000	
	N	184	184	184.000

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

The relationship between teachers' competency and teacher's confidence level towards using ICT

The result shown in Table 3 explains that teacher's competency is positively correlated to teachers' confidence level toward using ICT (0.749, $p<0.05$). The relationship is significant at the level 0.01 level. The value 0.749 indicates that the correlation is very high. By using the principal of R^2, R^2 is 0.56 (0.7492). Based on the R^2 value, it can be concluded that teacher's competency explains 56 percent of the variability in teacher's confidence level toward using ICT and vice versa.

The relationship between teachers' confidence level towards using ICT and teachers' satisfaction toward ICT training programmes

The result shown in Table 3 reveals that teacher's confidence level toward using ICT is positively correlated to teacher's satisfaction toward ICT Training Programmes (0.571, $p<0.05$). The relationship is significant at the 0.01 level. The value .571 indicates that the correlation is at a moderate level. By using the principal of R^2, R^2 is

0.33 (.5712). Therefore, teacher's confidence level toward using ICT explains 33 percent of the variability in teacher's satisfaction toward ICT training programmes and vice versa.

The relationship between teachers' competency and teachers' satisfaction toward ICT training programmes

The result shown in Table 3 also explains that teacher's competency is positively correlated to teacher's satisfaction toward ICT Training Programmes (0.496, $p<0.05$). The relationship is significant at the 0.01 level. 0The value 0.496 indicates that the correlation is moderate. By using the principal of R^2, R^2 is 0.25 (.4962). By referring to the R^2 value, teacher's competency explains 25 percent of the variability in teacher's satisfaction toward ICT training programmes and vice versa.

DISCUSSION

The results indicate that Malaysian teachers have a high level of ICT competency. This means that these teachers are able to use most ICT tools such as using computers, preparing slides to present their lessons, using internet to search for the updated information, designing simple web sites etc. The results also indicate that Malaysian teachers have a high level of confidence level in using ICT. This means that they trust that they can use ICT tools perfectively and that they are able to integrate these tools to their teaching process. Finally, the results indicate that Malaysian teachers have a high level of satisfaction toward ICT training programmes. Therefore, it can be concluded that teachers believe ICT training programmes provide them with the sufficient knowledge about ICT which in its role satisfies them and make them more encouraged and motivated.

For the relationship between teachers' competency (TC) and teachers confidence level towards using ICT(CL), the results indicate positive relationship between teacher's competency and teacher's confidence level toward using ICT. This means that the more teachers' competency the more confidence level of them for using ICT actually in Malaysian schools. Also the high level of confidence results the high level of competency, for example, the teachers who has a high confidence level will be motivated and encouraged to improve their competencies of using ICT, so they will trust that they are able to solve technological problems that faced by them. This results support the research findings by Becker and Riel (2000) and William (1993).

The results indicate positive relationship between teacher's confidences level and teacher's satisfaction toward ICT training programmes. It can be concluded that teachers' confidence level toward using ICT tools depends on their satisfaction toward ICT training programmes, for example, when a teacher believe that ICT training programmes meet his needs and they are high quality, he will trust that he will learn the sufficient knowledge about ICT that will enable him to conduct his teaching processes effectively and without any fear or anxiety.

The results also found that there is a positive relationship between teacher's competency and teacher's satisfaction toward ICT training programmes. The findings show that the level of teacher's satisfaction toward ICT training programmes influences the teacher's competency. If the teacher is satisfied about the programmes, he will easily improve his capabilities of using ICT, for example, he will learn ICT for pleasure because he is enjoyed for attending the ICT program; also he will be sure that he will find the timely help and answers for his questions. The results supported a research by Chwee et al (2007).

CONCLUSION

The findings show that teacher's competency, teacher's confidence level, and teacher's satisfaction toward ICT programmes are correlated among each other. Malaysian teachers have a high competency level toward using ICT tools where they know how to use most of the ICT tools (such as computer, internet, designing home pages, projectors etc.) an how to integrate these tools and knowledge in their teaching process. The findings also show that Malaysian teachers have a high confidence level toward using ICT and they trust that they can use ICT perfectively without any fear or anxiety. In terms of their satisfaction towards ICT training programmes conducted by the ministry, the study found that most of them highly satisfied toward the programmes. They believed by attending the training programmes, it would be able to increase their capabilities toward using ICT and their productivity. These research findings also indicate that teachers' satisfaction toward ICT training programmes is a very important factor that can increase the levels of the competency and confidence. Thus, ICT training programme s' decision makers must pay a great attention to this factor. Therefore, they must formulate strategies that not only may increase teachers' satisfaction but also exceed their expectations of the acquired knowledge that they may gain at the end of the course.

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