Perceived Attitude of Teachers in Rural Areas towards Information and Communication Technology

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Abstract: Despite several strategies to incorporate Information and Communication Technology (ICT) in education, not much research has been done to assess teacher's readiness on these initiatives and programs, including attitude towards ICT among teachers in rural areas. The issue needs to be addressed so as to ensure readiness in integrating ICT in the school curriculum, as a means of bridging the digital divide. This paper aims to examine teacher's attitude towards ICT by looking at a case study in the rural area of Kundang Ulu, Malaysia. Data collection was conducted using questionnaire survey. 39 responses from teachers in Sekolah Menengah Kebangsaan Tengku Temenggung Ahmad (SMKTTA) in the rural district of Kundang Ulu, Johore were gathered. The questionnaire comprised of demographic variables and attitude towards ICT scale with three components of affective, cognitive and behavioral aspects. Research findings show that majority of these teachers own computers in their homes and theyhave high levels of computer access. These teachers' attitudes towards ICT are positive. Thereare no significant differences between gender and age group. Findings from this study have implicationson the approach of implementing ICT in the educational setting, especially in rural areas. Schools are required to provide enough facilities for teacher's hands-on experiences. With the obtained ICT skills and positive attitude towards ICT, teachers should incorporate productive computing activities in the classroom such as using purposive web searching, spreadsheet and database programming.

Key words: Technology readiness, digital divide, education, spreadsheet, Malaysia

INTRODUCTION

Information and Communication Technology (ICT) is continually emphasized in empowering the Malaysian society socially and economically. Even though the country has outlined a vision to integrate ICT to boost the economy so as to become a developed nation by the year 2020, digital divide remains prevail. There are gaps between individuals, households, businesses and geographical areas at different socioeconomic levels regardless of the opportunities to access ICTs and the internet. Studies have shown that the digital divide in Malaysia (Ahmad and Abiddin, 2009; Judi et al., 2011) revolves around the utilization of ICT with the poor rural and minority groupslagging behind. Despite the geographical and physical issues seem to appear as the contributing factors to this phenomenon yet it is the social factor that remains significant.

Various measures have been taken to overcome this issue, which include that students should be more exposed to hands-on experience, especially in school. An and Zaitun (2003) and Zaitun and Crump (2005) have suggested one way to bridge the digital divide in Malaysia that is by providing more computer education and computer activities. However, it is evident that not every single family has the financial means to own computers at home. Thus, schools should play the role in helping the students in acquiring the ICT skills. In relation to this, teachers are required to promote the use of technology, including ICT in the teaching and learning process (Ozel, 2007). Hence, teacher's attitude towards ICT is also paramount in influencing the use of computers in the classroom (Kumar et al., 2008; Al-Khanjari et al., 2005).

Numerous important strategies have been outlinedin improving the quality of education systems in both primary and secondary schools which include the establishment of Smart Schools. These smart schools are required to apply the state-of-the-art techniques/strategies/conceptsin teaching and learning by incorporating technology. In the light of this matter, the Malaysian Ministry of Education (MoE) has provided the necessary infrastructure and facilities in order to boost the use of ICTin teaching and learning. Despite all

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the efforts and investments made by the government,notmany researches have been carried out to assess teacher's readiness on these initiatives and programmes. Teacher's attitude towards ICT remain unrevealed although Mahmud and Ismail (2010) have asserted that majority of teachers in Malaysia have positive attitude towards ICT.

Sincethe application of ICT in education is more critical inrural areas, the teacher's attitude towards ICT in these areas ought to be made known.Therefore, this study seeks to examine the teacher's attitude towards ICT by means of a case study in the rural area of Kundang Ulu by focusing on the following research questions: Whatare the demographic characteristics of the teachers; Based on the attitude towards ICT instruments what is the overall teacher's attitude towards ICT; Is there any difference in attitude towards ICTin terms of gender and according to the age groups of the teachers.

Attitudes towards information and communication technology: The attitude and trust in using technology especially ICT play important role among teachers as this could influence the implementation oftechnology in the teaching and learning process (Bakr, 2011). These are two majorbeliefs that can be used to predict the teacher's future use of technology in the classrooms (Myers and Halpin, 2002; Teo, 2008). Teachers with positive attitude tend to apply ICT in their daily life, including in the classroom and subsequently contribute to the diffusion of ICT in their educational practice (Bakr, 2011). On the contrary, negative attitude towards ICT may create a major obstaclefor the effective use of technology in the classrooms (Christensen and Knezek, 2009). Thus, teacher's attitudes, values and beliefs should be given focus in supporting such an effort (Albirini 2006; Levin and Wadmany, 2006).

Aiken (1996) describes an attitude as "learned predisposition to respond positively to certain objects, situations, institutions, concepts or persons". Eagly and Chaiken (1993) have proposed a general framework of attitude. Attitude could be classified into three categories, which are affective, behavioral and cognitive. Affective attitude describes the emotion and the ability to feel another object. Items which may reflect positive and negative feelings towards ICT may include getting excited in using the latest hardware, enjoys talking about computers and its technology and feels comfortable in using computer applications as in other electronic equipment.

Behavioral attitude reflects the commitment and actions towards the attitude object. In this study, behavior may represent how students react to ICT. It may

include aspects such as the value of ICT ina person's life, the level of individual interest in learning the latest in ICT andthe person's efforts related to ICT problems. Cognition is the perception of information about the attitude object. Cognitive attitude may refer to how individuals perceive ICT might bring benefitsto theirlives. These might include aspects such as the usefulness of ICT in their lives or by relating ICT to their daily lives. In the context of attitude towards ICT, itmay be measured by looking at/measuring their perception of intellectual knowledge and skills when applied to ICT (Judi *et al.*, 2011). The related items that measure this component are ICT helps in many ways which make teaching and learning more interesting and efficient.

Teacher's attitude towards ICT has been researched from various dimensions. A survey by Mahmud and Ismail (2010) on Malaysian in-service teachers finds that majority of the teachershave positive attitude towards ICT. Meanwhile, their basic ICT knowledge and skills are considered moderate. Formal ICT training and experience in using ICT have a significant influence on their attitude towards ICT and ICT literacy consequently. Findings by Bakr (2011) who examinesEgyptian teacher's attitude towards computers using the Affective, Cognitive and Behavioral subscales in the ATCI suggests that the attitude of these teachers towards ICT are positive. The result also suggests that there is no difference in perception towards computers between male and female respondents. Both new and experienced teachers at government schools have the same level of interest in computers.

A similar situation in Turkey was explored using Science Teacher's Attitude towards ICT in Education (STATICTE) Instrument by Cavas *et al.* (2009). It is found that the Turkish primary science teachers havepositive attitude towards ICT attitudes. Although no gender differences existwith regard to their attitudes towards ICT, differences do existbased on their age, ICT skills and ownership of computers at home. Yusuf and Balogun (2011) have conducted an assessment of Nigerian student-teacher's competence and attitude toward information and communication technology. The findings reveal thatthe majority of the student-teachers in Nigeria havea positive attitude towards the use of ICT in the education curricula, Both male and female student-teachers display similar attitudes towards ICT. The findings suggest that there is the lack of necessary competence in the full integration of ICT in the curriculum, thus the ICT content of teacher education programs in universities in developing nations needs to be improved.

MATERIALS AND METHODS

The nature of this study is quantitative; a survey method was adopted and a questionnaire was employed to collect data. This study examines the attitude of secondary teachers in Kundang Ulu towards ICT. Kundang Ulu represents a rural area in the southern part of peninsular Malaysia. Therefore, the target population of this study was Malaysian teachers enrolled in secondary schools. Stratified samples were used to obtain the data. The stratified group of the population is represented by the teacher's subject. Altogether, a total of 39 teachers answered the questionnaire.

A structured questionnaire was developed by the researchers after doing an extensive review of the literature. Various previous works have been used, for example from Hindi *et al.* (2002) and Ahmad and Abiddin (2009). The instrument was evaluated by five academicians who work in the field of ICT and have extensive experience in ICT literacy research. The academician's involvement in this stage is to determine the face validity and content validity of the instrument in ICT literacy. The instrument was improved based on the feedback of these academicians. A pilot study was conducted on 15 secondary teachers to establish its internal consistency and reliability (Shaft *et al.*, 2004). The results from the pilot study show that all items could be retained in the instrument. The final instrument consists of four general sections. In Part A, the teachers have been asked to provide demographic data. Nine demographic items have been used, such as gender, age categories, subject that they are teaching, information about their computer usage and experience and their sources of ICT knowledge. The other part consisted of: hardware and software ICT skills, (C) attitude towards ICT and (D) internet knowledge.

Part C contains 14 items with 5 point Likert-scale (1 = strongly disagree, 2 = disagree, 3 = slightly agree, 4 = agree, 5 = strongly agree). This part was developed to measure teacher's attitude towards ICT, especially in education. This study suggests the attitude to be divided into three categories: negative (1.0-2.5 mean score), neutral (2.6- 3.5 mean score) and positive (3.6-5.0 mean score). In order to determine the reliability of the instrument, Cronbach alpha coefficients were calculated. The instrument showed a high internal reliability with a calculated scale of 0.94. The reliability of affective, behavioral and cognitive subscales were also high, at $\alpha = 0.930$, 0.928 and 0.829, respectively. The data were analyzed using SPSS Version 22.0 to produce descriptive statistical indices, t-test and ANOVA to present the data and to examine the differences on the scale score based on the demographic characteristics.

RESULTS AND DISCUSSION

One of the objectives of this study is to look at the demographic characteristics of the teachers. These characteristics are presented in Table 1-3. As shown in Table 1, more than half (64%) of the teachers are female. About half (52%) of the teachers are between 35-49 year of age. The composition of the subjects taught by the teachers are Arts (32%), Pure Sciences (32.5%), Mathematics (28%) and Accounting (8%). Table 2 presents the teacher's background in ICT. Results show that majority (84%) of the teachers own computers at home and a very high percentage (92%) have more than five years of experience in using computers. 72% of the teachers spend at least five hours on the computer in a week. In terms of ICT ability, majority of the teachers perceived themselves as not skillful (88%). The sources of

Table 1: Respondents background

Factor	Category (%)
Gender	
Male	36
Female	64
Age (years)	
21-34	36
35-49	52
>50	12
Subject teaching	
Arts	32
Pure Science	32
Mathematics	28
Accounting	8

Table 2: Background regarding ICT

Factor/categories	Percentage
Own computer	
Yes	84
No	16
Experience using computer (year)	
<1	0
1-4	4
5-10	92
Computer usage in a week (h)	
<1	8
3-5	20
5-7	32
Over 7	40
Ability using computer	
Very skillful	0
Skillful	4
Not skillful	88
None	8

Table 3: Sources of computer skills

Factors	Percentages
Self learning	96
Learning from friends	76
Learning from courses in schools	52
Learning from other courses	52
Learning from UKM courses	44
Learning from media	8

Table 4: Mean Score of Attitudes toward ICT Scale

Items	Mean	SD	Category
Using the computer when there is opportunity	4.28	0.614	c
Interested in studying computer	4.24	0.597	b
Computer skills are very important for students	4.24	0.663	c
Computers make teaching and learning more interesting	4.24	0.723	c
Computers save time to work	4.21	0.588	c
Computers help in many ways, including calculating	4.12	0.600	c
Enjoy talking about computers and its technology	4.08	0.717	b
Always wanted to know about the latest in computer	3.92	0.909	b
Computers make teaching and learning effective	3.88	0.666	a
Prefer to work with the help of computers over the manual	3.88	0.726	c
Seek help in resolving computer problems	3.48	0.872	b
Using the computer application is as easy as other electronic equipment	3.48	0.770	a
Using the latest hardware is exciting	3.40	0.866	a
Excited in trying out new software	3.25	0.794	a

a = affective, b = behavioural, c = cognitive

Table 5: Percentage distribution of Attitudes toward ICT scale

Items	1	2	3	4	5
Using the computer when there is opportunity	0.00	0.000	8.0	60.0	32.0
Interested in studying computer	0.00	0.000	8.0	60.0	32.0
Computer skills are very important for students	0.00	0.000	12.0	52.0	36.0
Computers make teaching and learning more interesting	0.00	0.000	12.0	64.0	24.0
Computers save time to work	0.00	0.000	16.0	44.0	40.0
Computers help in many ways, including calculating	0.00	0.000	8.0	56.0	36.0
Enjoy talking about computers and its technology	0.00	12.000	48.0	28.0	12.0
Always wanted to know about the latest in computer	0.00	12.000	40.0	36.0	12.0
Computers make teaching and learning effective	0.00	0.000	32.0	48.0	20.0
Prefer to work with the help of computers over the manual	0.00	0.000	20.0	48.0	28.0
Seek help in resolving computer problems	0.00	8.000	20.0	44.0	28.0
Using the computer application is as easy as other electronic equipment	0.00	16.000	44.0	32.0	4.0
Using the latest hardware is exciting	0.00	8.000	44.0	40.0	8.0
Excited in trying out new software	0.00	4.000	16.0	68.0	12.0

1 = very disagree, 2 = disagree, 3 = slightly agree, 4 = agree, 5 = very agree

the teacher's ICT skills are presented in Table 3. The teachers acquired/ the skillsby learning on their own (96%), friends (76%), courses in schools and outside schools (52% each), courses organized by the university (44%) and from the media (8%).

The second aim of this studyis to investigate the teacher's attitude towards ICT. Table 4 presents the descriptive statistics. The mean score shows that most itemshave been highly rated by the teachers (categorized as positive attitude). Among these items are aspects concerned with the tendency to use the computer when there is opportunity, interest in studying computers, the importance of ICT among students and in teaching and learning, the benefit of using ICT in saving time and enjoy talking about ICT. The items in the scale concerning attitudes towards ICT were categorized into three components: affective, behavioral and cognitive. As seen in Table 5, the mean score of each componentis 3.60, 3.80 and 4.21 respectively,hence this is considered as a positive attitude. The third objective of this studyis to examine whether there are differences in ICT attitude in terms of gender and according to the age group of the teachers. Table 6 and 7 present the results of independent t-test samples and ANOVA, respectively. The

Table 6: Mean score of Attitudes toward ICT subscale

Category	Minimum	Maximum	Mean	SD
Affective	2.50	4.75	3.60	0.551
Behavioral	2.50	5.00	3.80	0.608
Cognitive	3.00	5.00	4.21	0.594

Table 7: Comparison of Attitudes toward ICT subscale based on gender category

Mean	Male	Female	t-value	p-value
Affective	3.8333	3.5714	0.739	0.522
Behavioral	3.9375	3.7750	0.480	0.636
Cognitive	4.4583	4.1583	0.918	0.368

Table 8: Comparison of Attitudes toward ICT subscale based on age group

Category	<34	Mean (35-49)	>50	F-value	p-value
Affective	3.611	3.577	3.750	0.080	0.924
Behavioral	3.639	3.896	3.917	0.498	0.615
Cognitive	4.018	4.244	4.500	0.894	0.424

results of t-statistics and p-value for each component are: affective (0.739 and 0.522), behavioral (0.480 and 0.636) and cognitive (0.918 and 0.368). These results suggest that thereare no significant differences between female and male teacher's mean scoresfor each component. Regarding the teacher's age group,Table 8 are the results of ANOVA test and p-value: affective (0.080 and 0.924), behavioral (0.498 and 0.615) and cognitive (0.894 and 0.424). Similarly, thereare no significant differences among

the three age groups of the mean scores of each component. These sections present important findings and conclusions regarding ICT attitudes among Malaysian teachers in rural areas, based on one case study of Kundang Ulu. The findings are discussed in accordance with the research objectives. The results show that majority of the teachers own computers at homes, thushaving high levels of computer access.

Teacher's awareness of ICT and the opportunity to gain access to computers contribute to the level of them using technology in teaching (Cavas *et al.*, 2009). The accessibility and availability of computers are perhapsimportant factors which affect the use of computers for instructional purposes (Medlin, 2001; Surendra, 2001). Furthermore it is evident that the ability to try and observe the results from the innovation in using the available technology are two significant attributes that might increase the rate of adoption of ICT among teachers (Rogers, 1995). In this study, teachers have demonstrated positive attitude towards the use of IT. The highest mean scoreis reported for each affective, behavioral and cognitive component. The findings support the results of Mahmud and Ismail (2010) and Zaidtun *et al.* (2012) who affirm that Malaysian teachershavepositive attitude towards ICT and possess a high level of ICT competency.

A person's attitude towardsICT is associated with a variety of factors, including computer liking, computer confidence, computer anxiety or comfort, achievement, usefulness and years of computer use, level of technology used in the classrooms and self-efficacy (Cavas *et al.*, 2009). According to Chen and Chang (2006), attitude, experience and practice are interrelated variables. Thus, these teacher's positive attitude might be related to their ability to access and use the technology.

The results also reveal that no significant difference exists between male and female teachers. Similarly, no significant difference was found in the different age groups of these teachers. This suggests that both male and female teachers have the same perception about computer. This is consistent with the findings of Bakr (2011), Cavas *et al.* (2009) but contradicts that of Shapka and Ferrarib (2003) and Sadik (2005). ICT usage is widely perceived as a masculine activity and ICT skills are generally better acquired by males (Todman, 2000). Female teachers seemed to be less confident about using ICT (Bakr, 2011). However, the resultsof previous studies on teacher's gender and ICT show no consensus that male teachers have more experience and use ICT more (Balka and Smith 2000). The absence of gender differences in teacher's attitude towards ICT might be due to two factors (Bakr, 2011). First, the change of female user's

attitude where females today appear to be more comfortablein using ICT than before (Ray *et al.* 1999). Second, the increased use of ICT in teaching and learning in schools has diminished gender differences among teacher's attitude towards computer.

In terms of the teacher's age group and consequently their teaching experience, the results prove that there are no significant differences among teacher's attitude towards ICT. This result, however, does not support Cavas *et al.* (2009) study which indicates that younger teachers (teaching science) had more positive attitudes and significantly differs thatof the teachers in other age groups. One of the reasons for the difference is attributable to the sample of the study done in Turkey, which largely comesfrom a young population who have positive attitude towardsthe use of ICT in the classrooms. The findings of the current study is consistent with Bakr (2011) who observed no significant difference in ICT attitude with reference to teacher's experience. The fact that in-service ICT trainingis offered to most of the teachers of all levels, regardless of their age the similar case in Malaysia- needs to be considered. According to Mahmud and Ismail (2010), formal ICT training has significant influence on teacher's attitude towards ICT. The ICT programme appears tobe an important factorcompared to demographic characteristics that contribute to teacher's attitude towards ICT.

The findings also suggest some implications. The teachers in rural areas, in this case in Kundang Ulu have been found to have positive attitude towards ICT. Thus, they are predicted to be able to perform ICT in classrooms (Teo, 2008). With reference to this matter, the authority should cater the needs to implement technology in the educational setting, especially in rural areas. Most schools in rural areas need help to run more ICT programmes and facilities to enhance their student's ICT skills (Judi *et al.*, 2011). Students in rural areas depend highly on computer facilities provided by their schools. Their counterparts in urban areas seem to be more fortunate because they have more opportunity to access ICT facilities, either by using their own computers or cybercafés in their neighborhood.ICT implementation in the educational setting should include the maintenance of ICT facilities and the development of structured ICT training and programmes in schools, to ensure that the benefitsfor rural students can be realized. According to Ajayi (2009), the authority needs to play a significant role, for example, in developing an ICT policy implementation commission that provides ICT facilities in schools and also monitor their use. ICT education should be embedded in the curriculum and to be made compulsory for all secondary school students. Efforts should also be

made by the Ministry of Education to allocate skilled ICT teachers to each secondary school to impart ICT skills to their students. Samuel and Baka (2007) have reported that a fairly large number of teachers in Malaysian schools have the necessary ICT skills, yet the application of ICT tools in teaching and learning is not enough.

ICT training for local teachersis still inadequate (Lau and Sim, 2008). ICTis rated as the highest in the needs of Malaysian urban and rural science teachers (Zahrani, 2009). In addition, softwares and programmes with local contentare still scarce. More formal trainings for teachersare required to cover the use of ICT in the classroom and also the use of effective instructional materials and teaching models. New learning environments such as ubiquitous learning need to be introduced and practised by teachers to facilitate the evolution of the technology with enhanced academic performance (Zahrani, 2010). As suggested by Cavas *et al.* (2009), courses related to instructional media and technologies for teachers and educators need to be re-constructed and made obligatory if possible.

CONCLUSION

These research findings have shown that teacher's attitude towards ICT in Malaysian rural areasis positive. There are also no significant differences of attitude towards ICT between gender and age groups. With this scenario, there should not be any problems for teachers to incorporate productive computing activities in the classroom, such as using purposive web searching, spreadsheet and database programming. Further and deeper research on teachers' attitude towards ICT and the implementation of ICT in educational settings, especially in rural areas need to be conducted. The frameworkfor the use of technology in the classroom and effective and efficient instructional materials and teaching models to support ICT education in rural areas are required.

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