Determinants of Information and Communication Technology Usage among Village Administrators in Malaysia Using Extended Technology Acceptance Model

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Abstract: ICT projects in Malaysia have been one of the impetuses for achieving development in this country. Parallel with the ICT development in Malaysia, ICT usage among the Malaysian has increased significantly. Nonetheless, things are different in the rural areas where past studies have shown that ICT usage among the rural community in Malaysia is still discouraging. Albeit this fact are the same situation can be identified among the village administrators and what are the factors that impinge their ICT usage? Purportedly, as the leaders of the rural community they should use ICT in order to encourage the rural community to use ICT. This quantitative study used questionnaire to gather information. Through a multi-stage random sampling, a total of 240 village administrators from four states in Peninsular Malaysia have been selected as the respondents. In general, ICT has been used moderately among the village administrators. All of seven factors of Extended Technology Acceptance Model studied have been detected to be positively and significantly related with ICT usage while self-efficacy was identified as the main contributor towards ICT usage. A number of recommendations and discussions have been highlighted and expectantly it can aid the concern parties and policy makers in drawing plans for strengthening the ICT usage among the rural community leaders.

Key words: Village administrators, ICT usage, Extended Technology Acceptance Model, ICT development, rural development

INTRODUCTION

Information and communication Technology (ICT) and rural administrators: ICT is a well-known tool used by majority of the people in the world. ICT is an essential stimulus for development. Remarkably, through the usage of internet, routine activities such as communication, information sharing and e-Commerce can be done just by clicking the computer mouse (Jung, 2001). To ensure the ICT development are exposed to the public, the Malaysian government has taken important step by establishing number of ICT programs and projects especially for the development of the rural community. ICT development has progressed well started in 1980 and still ongoing, programs such as Universal Services Provider (USP), Rural Internet Centre (PID), Rural Info Centre (MID), Computer literacy Centre, e-Community and National Broadband Initiatives (NBI) are among the leading ICT programs. Recently, around 1500 ICT centers in rural areas of Malaysia have been established and notably this has been initiated to narrow the ICT gap within the community, especially between those in the urban and rural areas (Musa, 2008). ICT has some lucrative things to be offered to the rural community and to let this things go is considered to be costly. Urban community should not be only the beneficiaries of ICT development it should comprise the rural community. Doubtlessly with systematic planning and strategies, ICT can drive the rural people as master in the mainstream of those seeking development solutions in the information age. To encourage the rural community to use ICT is not a simple task. They are the groups who are associated to traditional ways of doing things. Nevertheless, it would be easier if their leaders are ICT users and can stimulate the rural community to use it too. The Village Development and Security Committee (VDSC) members in

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Malaysia as the leaders of the rural community besides encouraging and promoting ICT usage to the rural community they themselves need to use ICT extensively for their administration and daily activities.

Usage of ICT, benefits and problem to use it in the rural area: ICT is one of the ingredients for the rural development in Malaysia. Nonetheless, a minimum usage of such superior technology particularly among those in rural areas is still a concern (Salleh and Azril, 2009). Such low level of usage has generated gap in term of ICT usage between the rural and urban communities. Findings by Sharifah (2003) have revealed a low computer possession and internet connection among the rural community while Malaysian Communication and Multimedia Commission (MCMC, 2008) have detected that only 18.0% of rural community in Malaysia used internet in 2008. Nonetheless, Musa (2008) proposed a solution by emphasizing that frequent exposure to suitable ICT programs will encourage rural community to use ICT while Samah *et al.* (2009) have stressed that albeit admitting the importance of computer in their tasks, VDSC members still needs computer and internet training to develop their ICT skills. These are alternatives that can be taken to cultivate ICT interest among the VDSC members.

Since, 1980, ICT has started to play its role in developing both the country and its community. Balakrishnan (2002) in his study has concluded that ICT is the benefits provider to the rural community in term of developing their skills and knowledge through the skills and knowledge developed it widens the employment opportunity, proliferate their income and fortify their networks. Apart from this, ICT can be considered as online library available 24/7 to the rural community which enables them to learn and be exposed to the new things at anytime and anywhere incontestably this can engender the knowledgeable rural community. Ideas and strategies in sustaining ICT usage particularly for the VDSC members must be planned astutely. The VDSC members must start to initiate their ICT knowledge and skills to be in line within the community development, Musa (2008), emphasized that current level of ICT usage among rural community reflecting that there is still lot of things to be done by the concerned parties. Musa (2008) and Hassan *et al.* (2009) furthermore have identified that majority of the rural community still reluctant to use ICT because they do not use it for their routine activities, unaware of ICT benefits lack of support from concern parties, inadequate number of ICT studies insufficient investment on ICT facilities, inaccessibility of internet services and language barriers are among identified

problems. Cullen (2001) has other perspectives when he identified that factors such as money, education, culture and content related are the keys to create ICT literate community. Also, Narimah have highlighted the factors of ignorance of ICT benefits and lack of time. Apart from this, Johnstone (2008) has stressed on geographic, environmental and contextual challenges can affect physical access to ICTs such as electricity, roads and ICT equipment. Once all of these facilities have been provided, expectantly the target groups of such technology will start to utilize it.

Village Development and Security Committee (VDSC): In the early stage of Malaysia independence, to develop the rural areas has been the main focus of the authorities due to the fact that a large portion of the rural areas is still undeveloped. By that time, it is a wise strategy to establish a body that would connect the government to the rural community development needs and demands and such establishment is forecasted to swift their development process. In tandem with the needs, the government has underlined the Village Development and Security Committee (VDSC) in 1975. The establishment of VDSC is in accordance to Order No. 3, Plan on Country and Rural Development 1962. Such establishemnt attempts to create a harmonious blend between the development and the rural community. Any considerable development programs needed by the rural community will be demosrtated by the VDSC to the government. Apart from such attempt, VDSC is accounted to solve four main problems confronted by the rural community which were poverty, health, illiteracy and lackadaisical attitude.

Certainly, rural development programs in Malaysia have gone though a number of evolution programs such as Gerak Maju (established in 1966), Jaya Diri (established in 1968) and Gerak Pembaharuan (established in 1972). Such evolution is needed to ensemble the programs within the needs of the rural community. Additionally, to further strengthen the rural organization, the National Security Council on Rukun Tetangga and Plan on Community Relationship has introduced VDSC on August 1975. VDSC was formerly known as Village Development Committee (VDC). Each of the VDSC organization consist of 15 members where it is lead by the VDSC chairman and typically, VDSC chairman is the leader of the village community. Apart from VDSC chairman, VDSC typically consist of vice chairman, treasurer, secretary and a number of committee members.

In line with, the rapid development of the rural areas now a days, roles of VDSC are extremely important. To ease the rural development process number of VDSC

members have been doubled. Referring to the recent statistics prepared by KEMAS there are 4,654 villages listed in VDSC program which comprise of 69,810 VDSC members across the country. Albeit there are a good number of VDSC members are all of the VDSC members as rural leaders are ICT literate? If not, they should be instilled with ICT skills and knowledge as a catalyst to create e-Community.

Village vision movement: Apart from VDSC, the emergence of Village Vision Movement (VVM) concept is expected to further intensify the ability of the rural community which could elevate the rural community consciousness and attitude towards the importance of rural development. The aim of the VVM is to bring development to the rural areas and such development is able to generate well developed attractive and profitable villages. Similar to VDSC, VVM has gone through a number of evolution processes. At the early stage, it was known as Rural Vision Movement (RVM). Later, after restructuring, KEMAS was supported by three units namely Human Capital Unit, Community Education Unit and RVM was placed under the unit of Rural Development. Realizing the importance of RVM, it was then reorganized and intensified and was rebranded as Village Vission Movement (VVM) in 2003 and aiming to create rural community which are resilient, high initiative, self-dependent, knowledgeable and highly disciplined. To ensure the success of VVM, it is supported by State Development Unit (SDU) and Economy Development Unit (EDU). Nonetheles, albeit the facts that SDU and EDU are accounted to ensure the VVM success, participation of the villagers are highly encouraged as it can create systematic and well planned decisions which are relevant and well accepted by the agencies and the villagers. Certainly, the roles of VDSC is highly needed here as they can voice the needs and demands of the villagers to the authorities.

Balwi (2005) has done study on VVM, revealed that VVM is a brand that able to bring sense of pride to the villagers. Apart from this, according to Samah *et al.* (2009), VVM is a tool that can be effectively used to strengthen comptency, commitment and encourange involvement among the VDSC members. Moreover, VVM can be considered as empowerment process that able to generate positive attitude among the villagers particularly on their views on ICT.

The ETAM Model: Extended Technology Acceptance Model (ETAM) is the pillar of this study. It was invented by Hu *et al.* (2003) and was strengthened from Technology Acceptance Model (TAM). The main

different between the new and old model is the element of attitude is excluded from ETAM due to the researcher claim that it has a limited mediation impact. ETAM is based on six main factors and claim that decision to use a technology is associated with the factors of perceived usefulness perceived ease of ICT usage technology self-efficacy, job relevance compatibility and subjective norms as depicted in Fig. 1.

ETAM stresses that ICT usage will increase if someone considers ICT is easy to be used and generate benefits to them. Within the model, perceived usefulness is considered as the positive factor on ICT usage and it can be further strengthened if the users have experienced in using and handling ICT tools and software. ETAM also focuses on self-efficacy as the important determinants. Well known self-efficacy model developed by Bandura (1986), claimed that self-efficacy can be comprehended as the process where the individual judge his or her ability to use a computer and able to develop a positive perception on ICT usage. Nonetheless, self-efficacy impact on ICT usage is lessening if the users are frequently exposed and attended relevant trainings and courses (Hu *et al.*, 2003). ICT is considered as typical tool in almost all types of jobs including the VDSC tasks. The emergence of ICT centers in the rural area is forecasted to stimulate VDSC members to use computer and internet either in their routine activities or tasks. Within the ETAM, the germaneness of ICT towards VDSC members' routine tasks can impinge their ICT usage.

Within ETAM, subjective norm is considered as influential factor on ICT usage. This model emphasizes that a person may want to use ICT due to other people also use ICT. Therefore, VDSC members may want to use ICT because of their colleagues, family and community use ICT. Probably, among the factors that might intensify ICT usage are the numbers of ICT centers in their area, personal commitment to administration, family usage of ICT and others VDSC member's usage of ICT (Venkatesh and Davis, 2000; Gilligan, 2005). Nonetheless, the model stresses that this factor impinge for initial acceptance but then lessens in importance as they become skilled in technology usage (Hu *et al.*, 2003). It is great to have leaders who use ICT on their daily routine
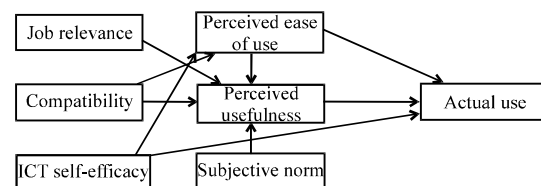
Fig. 1: Extended Technology Acceptance Model

since, VDSC members are the front liners and administrators they are attached and closed to the villagers and able to influence them to use ICT.

Factors affecting VDSC members' usage of ICT: Past studies on ICT have revealed factors that able to impinge or hinder ICT usage. Established models of ICT usage have concluded that a number of behavioral and environmental factors can impinge ICT usage and can be called as technology acceptance construct (Hu *et al.*, 2003). Typically, factors that are commonly associated to ICT usage are attitude, perceived ease of use, perceived usefulness, self-efficacy and computer compatibility. Apart from this, environmental factors such as subjective norm and job relevance are able to stimulate ICT usage (Kumar *et al.*, 2008).

Attitude: Attitude depicts someone's like or dislike towards something (Shih, 2004; Luarn and Lin, 2004). According to Dixon (2009), frequent usage and exposure to ICT are important things to be considered to form a positive attitude towards ICT. When people frequently use and expose to ICT, people will realize that the ICT is helpful and useful for them in their daily life thus, creating a positive attitude within them towards ICT usage. Referring to Zhang and Aikman (2007) attitude can be a mediator on the role of attitude toward object on behavioral intention. They further emphasized that having a positive attitude alone is not the main key to motivate villagers to use ICT, nonetheless, efforts should also be placed to detect the roots of such attitude. Furthermore, it is interesting to know that feature changes in the ICT tools also will influence attitude towards ICT. Zhang and Aikman (2007) in their study have proved that mandatory ICT users usually will have a negative attitude towards any change in the ICT tools that they frequently used.

Yi *et al.* (2005) believed that individual differences can be an important factor to form a positive attitude towards ICT usage. According to Yi *et al.* (2005), people with different age, gender and locality will have different attitude and perception towards ICT usage. Rural communities usually are related with negative attitude towards ICT usage compared to their counterpart in the urban areas. On the other hand, Duan *et al.* (2009) identified that inadequate skills and unfamiliarity towards ICT usage can create people's negative attitude towards ICT. Lack of knowledge on ICT will keep people in rural areas away from the ICT services such as internet and telecommunication and this directly will create people's

negative attitude towards ICT. Furthermore, computer anxiety is identified as one of the reasons for people's resistance to use ICT (Duan *et al.*, 2009).

Perceived usefulness and perceived ease of use: According to Meso *et al.* (2005), perceived usefulness and perceived ease of use greater reliability of the technology and easier access to ICT are among the contributor for greater confidence thus create greater usage of ICT. As rural communities level of ICT usage depend largely on how frequent they use ICT, widening their accessibility towards ICT facilities can stimulate their ICT usage. Furthermore, the available literatures related to ICT usage provide evidence on the influence of perceived usefulness and perceived ease of use on intention to use ICT (Agarwal and Prasad, 1999; Venkatesh and Morris, 2000).

When community perceived that ICT is useful, it can create consistent ICT usage. As claimed by Rogers (2003), perceived benefits must be present and continuous. In order for ICT to be perceived useful it must be low cost has the ability to reach wider market and able to gather large information within a short time and lower cost (Laudon and Laudon, 2000).

Compatibility: Rogers (2003), through his study defines compatibility as a level of invention is regarded as in tandem with the existing values past experience and needs of potential users thus it can be understood that a person is compatible in using ICT when they are able to work consistently with ICT. Moreover, social cultural values and belief previous adopted ideas and the needs can determine the level of compatibility. In a previous study completed by Gulbahar and Guven (2008), ICT compatibility was detected to be highly related with users experience and language used. Furthermore, Al-Ghaith *et al.* (2010) in their study have revealed that ICT trainings can enhance ICT compatibility. Conversely, some notable studies on ICT usage have shown that compatibility has a significant influence on intention to use ICT (Tan and Teo, 2000; Kumar and Best, 2006).

Self-efficacy: Self-efficacy can be understood as a person belief in his or her ability to successfully perform a specific behavior. Computer self-efficacy is seen as an individual's judgment on their ability to use numbers of computer domains while application-specific self-efficacy refers to an individual's judgment of their ability to accomplish particular computer related tasks within the domain of general computing (Compeau *et al.*, 1999).

There are abundance of earlier research that have proved that self-efficacy has an important role in influencing one's ICT usage (Compeau *et al.*, 1999; Johnson and Marakas, 2000). Besides, self-efficacy is also seen as one of the factors that was found as one of the dominant contributor towards ICT usage (Venkatesh and Morris, 2000; Lewis *et al.*, 2003). Yet, there are also some studies that clarified insignificant relationship between self-efficacy and ICT usage (Bolt *et al.*, 2001; Gallivan *et al.*, 2005). All the data gained by the earlier research suggest that self-efficacy is one of the important elements that should be incorporated in this study. Furthermore, it would contribute to a better understanding on the flow of behaviors in using ICT.

Subjective norm: This factor can be understood as individual perception of their surroundings/environments can impinge their intention to perform something (Fishbein and Ajzen, 1975). When the surroundings/environments have influenced on a person and that person is willing to comply he or she is likely to have behaved accordingly. There are a number of studies that proved that subjective norm has significantly affect usage of ICT among the rural community (Gilligan, 2005). Gilligan (2005) has portrayed the influence of subjective norm on ICT usage by concluding that rural people that live in areas where less people use ICT due to their limited access to ICT related information good and services will have a low level of ICT usage.

Job relevance: Job relevance is one of the dominant factors for ICT usage as stressed by Comfort *et al.* (2005) and Joseph and Andrew (2007). However, there are also some studies that oppose this view by saying that job relevance is not related to ICT usage especially among the senior people (Aboh, 2008). Referring to Comfort *et al.* (2005), rural community will use ICT if it is related to their daily tasks and job. Through their research, rural community will use ICT if it involves immediate needs and usually the rural community has to rely on ICT to seek information regarding agriculture products market prices, fertilizer price, weather information and job opportunities in the city. Joseph and Andrew (2007) have emphasized on the importance of job relevance on ICT usage where they stressed that government initiatives to enhance ICT usage among the rural community must be focused on the relevance of ICT to the rural community daily tasks and activities. This according to them will attract rural community to use ICT thus provide a lot of benefit for the development of the rural community.

MATERIALS AND METHODS

To identify the respondents, a multi-stage random sampling was conducted. At the first stage, a state from each zone (Northern, East coast, Southern and Central) was selected based on purposive sampling where the states were selected based on the highest number of VDSC members (Table 1).

After the states were selected using the same sampling procedure, a district with the highest number of VDSC members was selected to represent the state. At the district level, six villages were randomly selected and at the village level, ten VDSC members were randomly chosen (Table 2 and Fig. 2).

A total of 240 VDSC members have been selected as the respondents for this study. The number of sample was

Table 1: VDSC population in Peninsular Malaysia

Zones	States	No. of VVM villages	No. of VDSC members (number of VVM villages ×15 members)
Northern	Perlis	111	1,665
	Kedah	392	5,880
	P. Pinang	159	2,385
Central	Perak	485	7,275
	Selangor	384	5,760
	Wilayah persekutuan	31	465
Southern	Negeri Sembilan	290	4,350
	Melaka	195	2,925
	Johor	307	4,605
East Coast	Pahang	371	5,565
	Terengganu	429	6,435
	Kelantan	308	4,620

Overall total of VVM villages/VDSC members = 3,462; 51930

Table 2: Selected states, districts and villages

| Villages name	Zone	State	District
Kampung Kolam	Northern	Kedah	Kota Star
Kampung Hutan Belukar Kandih			
Kampung Taqwa			
Kampung Empa			
Kampung Tualang Selatan			
Kampung Kubang Lintah			
Kampung Changkat Tin	Central	Perak	Kinta
Kampung Ulu Kuang			
Kampung Tersusun Batu 6			
Kampung Sungai Tapah Tambahan			
Kampung Tengku Hussain			
Kampung Seri Kinta			
Kampung Teluk Ketapang	East Coast	Terengganu	Kuala Terengganu
Kampung Kubang Ikan			
Kampung Teluk Paku			
Kampung Gong Pak Maseh			
Kampung Kubang Badak			
Kampung Telaga Daing			
Kampung Parit Tengah	Southern	Johor	Batu Pahat
Kampung Sungai Lurus			
Kampung Parit Abdul Salam			
Kampung Parit Kemang			
Kampung Muhibah Peserai			
Kampung Sungai Punggur			
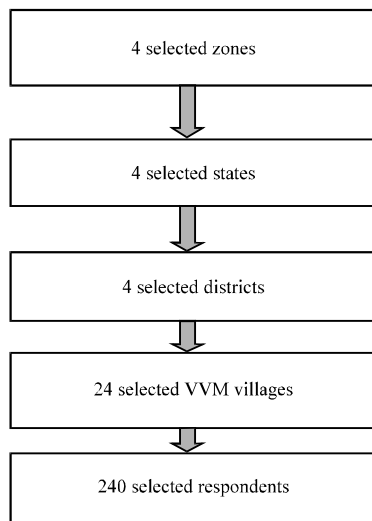
Fig. 2: Flow of the respondents selection

determined by the analyses needed by this study. To get the minimum number of sample for each analysis, it was based on the G Power Software. Power refers to the probability that the test to be conducted will detect a statistically significant difference or relationship when such difference or relationship exists. It also can be comprehended that power is the probability to reject the null hypothesis when needed to do so. It is generally accepted that power should be 0.80 or greater that is an 80% or bigger opportunity of finding statistically significant difference or relationship when there is one. To fulfill the objectives determined this study needs to run inferential analyses such as independent t-test, ANOVA, Pearson correlation and multiple linear regression. Using the G-power analysis based on the moderate effect size, alpha value = 0.05 and the magnitude of power between 0.90-0.95, the appropriate number of sample to run independent t-test is 176, the appropriate number to run ANOVA is 232, the appropriate number to run pearson product-moment correlation is 191 and the appropriate number to run multiple linear regression (stepwise method) is 119. To have a bigger sample size is not a problem as Mohammad Najib stressed that a bigger sample size have the ability to fortify the reliability and validity of this study.

To measure the reliability and the validity of the instrument used, a pre-test was conducted at two selected villages in district of Kuala Langat, Selangor. The pre-test has generated cronbach alpha value of 0.994 hence, surpassing the suggested value of 0.70 recommended by Nunnally (1978) and 0.60 by Mohd Majid more importantly, it proves that the instrument used was reliable. Data was collected using survey method. The respondents were provided with an option of ten likert-like scale option ranging from 1 (strongly disagree) to 10 (strongly agree). For actual data collection process, survey was employed. Trained and experienced enumerators were hired to ease the data collection process. For each respondent, the enumerators and the researchers took between 30-40 min to complete the questionnaire.

To achieve the research objectives suitable and relevant statistical procedures using SPSS were employed. Statistics such as frequency, percentage, mean, standard deviation, Independent t-test, ANOVA, Pearson product moment correlation and multiple linear regression were performed.

RESULTS

Respondents' background: The results on the respondents background is focusing on 21 questions that were related to gender, race, marriage status, job, income, experience in holding VDSC position, position in VDSC, period of staying in VVM village, number of household, computer possession, period of possessing a computer, main place of using computer, period of computer usage in a week, internet possession, period of possessing internet, main place using the internet, period of internet usage a week, whether or not their VDSC office have computer whether or not their VDSC office have internet whether or not they have attended any ICT course and whether or not their village have its own website. The results gained are presented in Table 3.

The results shown in Table 3 reveal that a total of 82.1% of the respondents were male. The mean score of age recorded was 50.0 years. More than one third of the respondents (34.2%) were in the age group of 41-50 years while only 19.6% of them were included in the age group of >61 years. In term of education level, it can be said that only a small number of VDSC members (20.4%) possess pre-university and university certificates. Slightly half of the respondents (52.5%) possess SPM/SPMV level of education compared to only 27.1% who possess primary school/PMR level of education. For type of job more than one thirds of the respondents (35.5%) were self-employed. Those who were working within the government sectors were also found to be the members of VDSC and they were 23.3% of the overall respondents. This study found that 15.6% of the VDSC members were private workers. The mean score for income per month is RM1,507.90 and slightly more than one third of the respondents (37.1%) found to earn more than RM1501 a month while minority of them (29.1%) were found to earn below RM750 a month.

Table 3: Respondents background

Variables	Frequency	Percentage	Mean	SD
Gender				
Male	197	82.1	-	-
Female	43	17.9	-	-
Age				
≤40 years	51	21.2	50.0	11.0
41-50 years	82	34.2	-	-
51-60 years	60	25.0	-	-
≥61 years	47	19.6	-	-
Level of education				
PMR and primary school*	65	27.1	-	-
SPM/SPMV**	126	52.5	-	-
University and Pre university	69	20.4	-	
Marital status				
Married	223	92.9	-	-
Single	9	3.8	-	-
Widower/Divorced	8	3.3	-	-
Type of job				
Self-employed	85	35.5	-	-
Retiree/Housewives	62	25.8	-	-
Government	56	23.3	-	-
Private	37	15.4	-	-
Income per month			1507.90	990.56
<RM750	70	29.1	-	-
RM751-RM1500	81	33.8	-	-
>RM1501	89	37.1	-	-
Value in Ringgit Malaysia (RM)				
Experience of holding a position in VDSC				
≤5 years	101	42.1	8.44	1.80
6-10 years	85	35.4	-	-
≥11 years	54	22.5	-	-
Position				
Top management	93	38.8	-	-
Committee	147	61.2	-	-
Period of staying in VVM village			38.34	16.82
≤30 years	90	37.5	-	-
31-45 years	64	26.7	-	-
≥46 years	86	35.8	-	-
Number of household			5.31	2.01
≤5 family members	125	52.1	-	-
≥6 family members	115	47.9	-	-
Possession of computer				
Yes	144	60.0	-	-
No	96	40.0	-	-
Period of computer possession (n = 144)			7.59	4.78
≤5 years	68	46.5	-	-
≥6 years	77	53.5	-	-
Period of computer usage a week			11.07	9.67
0 h	31	12.9	-	-
1-9 h	109	45.4	-	-
≥10 h	100	41.7	-	-
Computer connected to internet				
Yes	91	37.9	-	-
No	149	62.1	-	-
Period of internet possession (n = 91)			4.34	3.18
≤5 years	69	75.8	-	-
≥6 years	22	24.2	-	-
Period of internet usage a week			9.05	8.68
0 h	62	25.8	-	-
1-3 h	48	20.0	-	-
4-7 h	61	25.4	-	-
≥8 h	69	28.8	-	-
VDSC office has computer				
Yes	110	45.8	-	-
No	130	54.2	-	-
VDSC office has internet line				
Yes	30	12.5	-	-
No	210	87.5	-	-
Have attended any ICT course				
Yes	72	30.0	-	-
No	168	70.0	-	-

*Lower education certificate; **Higher education certificate/vocational education certificate

Based on the data, it can be stated that 22.5% of the respondents were experienced VDSC members due to their duration of holding the VDSC post for >11 years. Majority of the respondents were the committee position (61.2%). Based on the mean score recorded for staying in the VVM village (38.34 years), the respondents can be regarded as the senior villagers. More than one third of the respondents (37.5%) were identified to live at the VVM village for <30 years. A total of 35.8% have been living in the VVM village for >45 years. Among the respondents studied, a total of 52.1% of them have 5 or less family members in their house while a total of 47.9% of the respondents have 6 or family members in their house.

In term of computer possession, nearly two third of the respondents (60.0%) possessed computer. The mean score for computer possession recorded was 7.59 years and majority of them (53.5%) have possessed the computer for 6 years or more. Apart from this, the mean score recorded for computer usage in a week is 11.07 h and a total of 45.4% of them were using computer for 1-9 h a week.

A total of 37.9% of the respondents were found to posses the internet connection. Among those who possess the internet, more than three quarter of them (75.8%) have possessed the internet for 5 years or less while 24.2% of the respondent have possessed the internet for 6 years or more. More than a quarter of the respondents (28.8%) were identified to use internet for more than 8 h a week compared to 25.8% of the respondents who never use the internet. The mean score recorded for internet usage a week was 9.05 h. The respondents also were asked whether or not their VDSC office has computer and internet. The response of the respondents indicated that 45.8% of them have computer in their VDSC office while only 12.5% of the respondents claimed that their VDSC office have internet connection. A total of 30.0% of the respondents have gone to ICT course.

Overall level of ICT usage: The overall ICT usage was focused on two main parts. The first part focus on the ICT usage for administration works while the second part focuses on the ICT usage in daily activities/needs. To gain the overall level of ICT usage the cumulative mean score of 22 statements (10 statements for ICT usage for administrative works and 12 statements for ICT usage for daily activities/needs) was computed. This mean score then was grouped into three categories which are low (mean score from 1.00-4.00), moderate (mean score from 4.01-7.00) and high (mean score from 7.01-10.0). Based on the overall mean score gained for overall level of ICT

usage was (M = 4.04) it can be said that respondents have a moderate level of ICT usage. However, half the respondents (50.8%) were identified to score a low mean score in ICT usage between (1.00-4.00) as shown in Table 4.

Overall level of ICT usage for administrative works: To gain the overall level of ICT usage for administrative work among VDSC members, the cumulative mean score was computed from the 10 statements of ICT usage for administration work. The resulted mean score then was divided into three categories namely low (1.00-4.00), moderate (4.01-7.00) and high (7.01-10.0). Results gained have reflected a need to embolden VDSC members to ICT due to the facts that almost half of them (48.3%) are using ICT for their routines VDSC tasks at a low level. Nonetheless, on general, the VDSC members studied do have a moderate level of ICT usage for their administration works based on the mean score calculated (M = 4.47) (Table 5).

Level of ICT usage for administrative work: Measuring the level of ICT usage for administration work was based on the ten statements. For each statements, respondents were given an option of ten likert like scale question. Results gained have reflected a need to stimulate the VDSC members to employ ICT in their tasks due to the fact that ICT can aid them in their work such as producing

more effective and efficient tasks (Duan *et al.*, 2009; Pickernell *et al.*, 2004; Jung, 2001). Based on the results presented in Table 6, five statements managed to exceed the mean score of 4.50 namely preparing letters, memo, minutes meeting, reminder, etc. (M = 4.98), preparing village profile (M = 4.92), preparing monthly report regarding administration and village development (M = 4.84), preparing timeline for activities scheduled (M = 4.64) and preparing schedule for VDSC tasks (M = 4.58).

Overall level of ICT usage for daily activities/needs: Similar to the method to measure ICT usage in the administration works, the cumulative mean score was computed from the 10 statements of ICT usage for daily activities/needs to get the overall mean score. Then, this mean score then was divided into three categories namely low (1.00-4.00), moderate (4.01-7.00) and high (7.01-10.0). Results depicted in Table 7, a total of 48.3% use ICT for their daily activities/needs at a low level compared to those who use ICT at a high level (21.3%). The overall mean score depicted in Table 7 show that VDSC members have moderately used ICT in their daily activities/needs.

Level of ICT usage for respondents daily activities/needs: To know the level of ICT usage for respondents' daily activities/needs a total of twelve statements related to the purpose of ICT usage among the VDSC members were prepared. For each statement, respondents were given an option of ten likert like scale question ranging from 1-10. Results depicted have concluded that VDSC members seem to have benefited from the usage of ICT for typing their personnel letters based on the mean score recorder for this purpose (M = 5.30). Based on the mean score of 4.40, the respondents have moderately used ICT for the purpose of reading the newspaper. Respondents also were found to record a moderate usage of ICT for seven other purposes.

Table 4: Overall level of ICT usage among VDSC members

Levels	Frequency	Percentage	Mean	SD
Low (1.00-4.00)	122	50.8	4.04	2.23
Moderate (4.01-7.00)	91	37.9	-	-
High (7.01-10.0)	27	11.3	-	-

Table 5: Overall level of ICT usage for administrative works among VDSC members

Levels	Frequency	Percentage	Mean	SD
Low (1.00-4.00)	116	48.3	4.47	2.63
Moderate (4.01-7.00)	73	30.4	-	-
High (7.01-10.0)	51	21.3	-	-

Table 6: ICT usage for the purpose of administration among VDSC members

	Scale											
	Low usage				Moderate usage		High usage					
Statements	1	2	3	4	5	6	7	8	9	10	Mean	SD
Preparing letters, memo, minutes meeting and reminder, etc.	18.8	12.5	10.0	7.9	6.7	5.8	9.6	9.2	11.7	7.9	4.98	3.12
Preparing village profile	18.8	8.3	16.2	7.1	7.1	5.0	8.8	12.5	10.0	6.2	4.92	3.03
Preparing monthly report regarding administration and village development	17.9	15.0	11.2	6.2	4.6	6.7	10.4	15.0	7.5	5.4	4.84	3.02
Preparing timeline for activities scheduled	20.0	13.3	9.6	7.5	7.9	8.3	10.8	12.9	5.8	3.8	4.64	2.88
Preparing schedule for VDSC tasks	21.2	13.3	10.0	6.2	10.0	7.5	8.3	11.7	7.9	3.8	4.58	2.93
Preparing sources for billboard at VDSC room, village hall or mosque	19.2	12.9	13.8	7.5	6.2	7.9	14.2	11.7	3.8	2.9	4.50	2.77
Preparing data and statistic of the village	18.3	16.2	13.8	4.2	11.2	6.7	9.6	12.1	3.3	4.6	4.45	2.82
Communicating with VDSC members and village community	28.3	10.8	9.2	7.1	7.5	3.3	7.9	13.3	7.9	4.6	4.43	3.10
Preparing presentation using Microsoft Power Point	32.9	14.2	9.2	5.4	7.5	5.4	7.1	8.8	6.2	3.3	3.90	2.96
Sending information required to related agency through e-Government services	37.1	12.1	11.7	7.5	7.9	7.9	5.40	5.00	2.50	2.9	3.43	2.65

The purposes were website surfing (M = 4.12) sending or reading e-mail (M = 3.88), downloading other related articles (ex: recipe, journal, article) (M = 3.59), watching video/television (M = 3.58), reading novel, book, article magazine) (M = 3.53), hearing to music/radio (M = 3.39) and using e-Government services (M = 3.35). However, the respondents must be taught and encouraged on how to benefit ICT usage for downloading music/video/picture (M = 3.23) using e-Banking services (M = 3.11) and chat/Skype (M = 2.80) due to the low level of usage recorded by these three purposes (Table 8).

Seven constructs of the study: In this study, discussion on the seven constructs of this study which are attitude towards ICT usage, self-efficacy in using ICT, perceive usefulness of ICT usage, perceive ease of use of ICT usage, compatibility in using ICT, ICT job relevance and subjective norms is presented. To gain the overall level for each construct, the cumulative mean score was gained from each construct. This mean score then was grouped into three categories which are low (1.00-4.00), moderate (4.01-7.00) and high (7.01-10.0). From the results presented in Table 9, it can be concluded that respondents studied recorded a moderate of perceived usefulness towards ICT usage (M = 6.88). The other 6 factors also recorded a moderate level towards ICT usage. The factors were perceive ease of use (M = 6.50), attitude (M = 5.91), job relevance (M = 5.83), self-efficacy (M = 5.38), subjective norm (M = 5.32) and compatibility (M = 4.82).

Relationship between seven constructs of ETAM and the ICT usage: Results presented in Table 10 are related tthe relationship between seven constructs of ETAM and the ICT usage among the respondents studied. The inferential analysis using Pearson product-moment correlation was performed to inspect any relationship that might occur between the seven constructs of ETAM and ICT usage. From the results, it was found that all seven constructs of ETAM have positive and significant relationship with ICT usage thus bring us to a clearer picture that all these seven constructs have something to do with ICT usage. Three constructs were identified to have a high and significant relationship with ICT usage and the constructs were self-efficacy (r = 0.765), attitude (r = 0.753) and compatibility (r = 7.50). Compared to these three, the other four constructs were identified to have a moderate and significant relationship with ICT usage and the constructs were job relevance (r = 0.663), subjective norm (r = 0.642), perceive ease of use (r = 0.609) and perceive usefulness (r = 0.522).

Constructs that significantly contribute towards ICT: Finally, multiple linear regression using a stepwise method was performed to identify constructs that significantly contribute towards ICT usage. Based on the results presented in Table 11, the most significant contributor towards ICT usage was found to be self-efficacy. This construct contributes 76.5% of variance in ICT usage ($R^2 = 0.765$). Attitude is one of the significant contributors which explains additional 6.3% variance in ICT usage ($\Delta R^2 = 0.063$). The subjective norm is another construct that contribute significantly towards ICT usage and this construct contributes an additional 2.9% variance in ICT usage ($\Delta R^2 = 0.029$). Conversely, perceive usefulness has been identified to be one of the significant contributors towards ICT usage and this construct explains additional

Table 7: Overall level of ICT usage for daily activities/needs among VDSC members

Levels	Frequency	Percentage	Mean	SD
Low (1.00-4.00)	116	48.3	4.47	2.63
Moderate (4.01-7.00)	73	30.4	-	-
High (7.01-10.0)	51	21.3	-	-

Table 8: ICT usage for daily activities/needs

	Scale											
	Low usage				Moderate usage		High usage					
Statements	1	2	3	4	5	6	7	8	9	10	Mean	SD
Typing personnel letters	20.4	5.0	10.8	3.3	8.3	9.2	10.0	16.7	8.3	7.9	5.30	3.07
Reading newspaper	28.8	7.5	11.7	6.7	7.5	7.5	7.9	11.2	5.8	5.4	4.40	3.03
Website surfing	30.8	9.2	10.4	8.3	9.6	4.6	7.9	9.6	5.0	4.6	4.12	2.95
Sending or reading e-mail	35.8	7.5	10.4	6.7	10.0	6.2	6.7	7.5	6.2	2.9	3.88	2.90
Downloading other related articles (ex: recipe, journal, etc.)	36.7	9.2	11.7	7.5	9.2	8.3	5.8	5.4	3.3	2.9	3.59	2.71
Watching video/television	32.1	10.8	12.5	9.2	12.5	5.8	7.5	7.5	1.2	0.8	3.58	2.48
Reading novel/book/article/magazine	36.7	10.8	11.7	8.8	7.1	5.8	6.2	7.5	3.3	2.1	3.53	2.70
Hearing to music/radio	36.7	10.4	12.5	8.3	9.6	6.2	8.3	5.4	1.2	1.2	3.39	2.49
E-government services	42.1	11.2	9.2	5.0	7.9	5.8	7.1	7.5	3.3	0.8	3.35	2.69
Downloading video, music and picture	40.0	11.7	12.9	8.8	5.0	6.2	7.1	3.3	2.5	2.5	3.23	2.58
E-banking services	41.7	13.3	13.3	3.3	7.9	4.6	8.8	3.8	2.5	0.8	3.11	2.49
Chat/Skype	46.2	11.2	12.9	6.2	10.0	3.3	4.6	3.3	1.7	0.4	2.80	2.25

Table 9: Constructs studied

Levels	Frequency	Percentage	Mean	SD
Perceived usefulness	-	-	6.88	2.43
Low (1.00-4.00)	31	12.9	-	-
Moderate (4.01-7.00)	69	28.8	-	-
High (7.01-10.0)	140	58.3	-	-
Perceived ease of use	-	-	6.50	2.45
Low (1.00-4.00)	40	16.7	-	-
Moderate (4.01-7.00)	82	34.2	-	-
High (7.01-10.0)	118	49.2	-	-
Attitude	-	-	5.91	2.48
Low (1.00-4.00)	57	23.8	-	-
Moderate (4.01-7.00)	90	37.5	-	-
High (7.01-10.0)	93	38.7	-	-
Job relevance	-	-	5.83	2.74
Low (1.00-4.00)	67	27.9	-	-
Moderate (4.01-7.00)	68	28.3	-	-
High (7.01-10.0)	105	43.8	-	-
Self-efficacy	-	-	5.38	2.78
Low (1.00-4.00)	76	31.7	-	-
Moderate (4.01-7.00)	91	37.9	-	-
High (7.01-10.0)	73	30.4	-	-
Subjective norm	-	-	5.32	2.12
Low (1.00-4.00)	61	25.4	-	-
Moderate (4.01-7.00)	125	52.1	-	-
High (7.01-10.0)	54	22.5	-	-
Compatibility	-	-	4.82	2.76
Low (1.00-4.00)	96	40.0	-	-
Moderate (4.01-7.00)	84	35.0	-	-
High (7.01-10.0)	60	25.0	-	-

Table 10: Relationship between ICT usage and selected independent variables

Variables	r	p-value
Self-efficacy	0.765	0.0001
Attitude	0.753	0.0001
Compatibility	0.750	0.0001
Job relevance	0.663	0.0001
Subjective norm	0.642	0.0001
Perceive ease of use	0.609	0.0001
Perceive usefulness	0.522	0.0001

Table 11: Factors that contribute to ICT usage among VDSC members using multiple linear regression (stepwise method)

Independent variables	b	Beta	R	R^2	ΔR^2
Constant	0.012				
Self-efficacy	0.263	0.323	0.765	0.586	-
Attitude	0.346	0.382	0.805	0.649	0.063
Subjective norms	0.255	0.229	0.823	0.678	0.029
Perceived usefulness	-0.216	-0.235	0.839	0.703	0.025
Compatibility	0.169	0.208	0.845	0.714	0.011

2.5% variance in ICT usage. The last construct that was identified to be one of the significant contributors towards ICT usage was compatibility. This construct contributes additional 1.1% variance in ICT usage. The analysis also reveals that these three factors explain 71.4% variance in ICT usage.

DISCUSSION

Results have reflected that self-efficacy recorded a positive and high relationship with ICT usage and results gained here is not surprising as it is in tandem with a number of previous studies (Compeau *et al.*, 1999; Johnson and Marakas, 2000). All of these studies have found similar result in which people with higher self-efficacy will use ICT more compared to those who have lower self-efficacy.

Yi *et al.* (2005) has revealed that rural community are usually related with negative attitude towards ICT but this study has found the opposite of Yi *et al.* (2005) when the construct of attitude were found to record positive and high relationship with ICT usage (r = 0.748), Shiro (2008) has found similar finding and concluded that positive attitude will results in positive ICT usage while Zhang and Aikman (2007) has proved that negative attitude will results in negative usage of ICT.

Results presented have indicated that compatibility has a high and positive relationship with ICT usage. Tan and Teo (2000) have revealed that compatibility has a significant influence on the VDSC intention to use ICT, the more compatible people with ICT, the more likely they will use ICT. To increase people compatibility on ICT usage, Gulbahar and Guven (2008) and Al-Ghaith *et al.* (2010) have emphasized on enforcement on their language skills. This is important as most of the ICT tools are available in English. This bring problems for VDSC members to use ICT as majority of the VDSC speak Malay and it can be noted that most of the software and Internet applications are developed and designed in English so, without doubt enforcement on English language among VDSC members are important to increase their compatibility in using ICT.

In this study, job relevance has recorded a moderate and significant relationship with ICT usage and it is in line with studies done by Comfort *et al.* (2005) and Joseph and Andrew (2007). Comfort *et al.* (2005) have listed the reasons why this is happening by stating that rural community will use ICT if it is related to their daily tasks and job and involves immediate needs. In the case of this study, probably, VDSC members will use ICT if it related to their administration and financial tasks of the VDSC organization. Joseph and Andrew (2007) have emphasized on the importance of job relevance on ICT usage where they stressed that ICT programs initiated by the government in the rural areas such as Pusat Internet Desa (PID) and Medan Info Desa (MID) must be focused on the relevance of ICT to the rural community daily tasks and activities.

Another factor that identified to have a moderate and significant relationship with ICT usage is subjective norm. Results gained in this study are not surprising as it is consistent with what have been done by Gilligan (2005) and Tan and Teo (2000). Gilligan (2005) for example has concluded why subjective norm is an important factor to constitute a good level of ICT usage by emphasizing that

rural people that live in areas where less people use ICT and limited access to ICT related information good and services will have a low level ICT usage compared to their counterpart in the urban areas. Result gained has proved that VDSC members surrounding environment do have influence on their behavior of use or not to use the ICT. In the case of this study, VDSC members ICT usage can be influenced by their family members, VDSC colleague, development agencies and existence of ICT centers in their village.

Studies done by Rogers (2003), Laudon and Laudon (2000) and Venkatesh and Davis (2000) have claimed that perceive ease of use have influence on ICT usage. Result gained in this study has supported these studies when the construct of perceive ease of use recorded a moderate and significant relationship with ICT usage (r = 0.609). In order for ICT to be perceived useful it must be low cost has the ability to reach wider market and able to gather large information within a short time and lower cost (Laudon and Laudon, 2000).

There are other literatures that are related to ICT usage and able to provide evidence on the influence of perceived usefulness on intention to use ICT (Hu *et al.*, 2003; Venkatesh and Morris, 2000; Agarwal and Prasad, 1999) and results of this study seem to agree with it. Based on the results presented, it can be concluded that the construct of perceive usefulness (r = 0.522) was found to have a moderate and significance relationship with ICT usage. Meso *et al.* (2005) and Rogers (2003) have concluded that the frequency of ICT usage among the rural community and the continuous benefits will create a better perceive usefulness towards ICT usage.

CONCLUSION

It can be concluded that the VDSC members have moderately used ICT. Analysis done have shown that VDSC members studied do have a good level of perceive usefulness towards ICT usage, self-efficacy towards ICT usage, subjective norm, perceive ease of use towards ICT usage, attitude towards ICT usage and ICT job relevance and compatibility of ICT usage. Pearson product moment correlation performed has detected positive and significant relationship between all the seven constructs and ICT usage among VDSC members while Multiple Linear Regression has confirmed that the construct of self-efficacy is the main contributor towards ICT usage among the VDSC members in Malaysia.

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