



# Factors influencing the rural students' acceptance of using ICT for educational purposes

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## Abstract

This study investigated rural students' acceptance toward using information, communication, and technology (ICT) for educational purposes based on the UTAUT model. Using the purposive sampling method, respondents were selected from secondary students living in a rural district in Malaysia. A questionnaire was used to collect data from 450 respondents. The SPSS software was used for data analysis in the form of descriptive statistics and correlation analysis. The study found that the facilitating conditions, social influence, performance expectancy, and effort expectancy were all significant determinants of behavioral intentions to use ICT for educational purposes. Comparing factors, the majority of students had higher mean values for the facilitating condition factor. Thus, the study provides recommendations to help authorities to prepare the appropriate technology equipment before new technology is introduced to rural students. It also provides recommendations for further research examining rural students' acceptance and use of technology.

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## Introduction

Information communication and technology (ICT) has been regarded as an important element for the economic growth and social development of a country. According to Edgar (2009), many countries in the world have seen great opportunity in implementing ICT-based initiatives for the development of communities in their respective countries. Malaysia, for example, has shown determination in efforts to bridge the digital gap between rural and urban residents to meet the needs of the national agenda, namely to strengthen the ability of citizens to participate in the development of the digital economy. This started with the introduction and implementation of the national ICT policy,

namely the National Telecommunication Policy in 1994, followed by the strengthening of infrastructure and an increase in the ability of ICT in the target community in order to achieve the 2020 vision toward creating a knowledgeable society. Musa, Bahaman, and HayrolAzril (2012) reported that various steps were taken and efforts implemented in order to achieve sustainability in programs and projects carried out, such as Smart Schools, telehealth, research and development clustering, a Multimedia Super Corridor, and cyber city.

According to Hasan, Murat, and Kemal (2007), the term rural areas is often associated with a small area, which has a low population and inadequate suitable space that makes such areas unprofitable to an organization. The National Statistics Department of Malaysia (2013) defines rural areas as a gazetted area with limited urban encroachment that has a population of less than 10,000 people. The rural community is usually labeled as a poor. Although poverty also occurs in urban areas, rural area issues more often

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serve as hot topics in any discussion (Siti, 2014). Some studies have found that a rural community is comprised of those who live in a state of poverty with inadequate facilities because they have a low level of education and a lack of skills in employment as well being influenced by hereditary factors (Agesa, 2004; Yuji, 2003).

Siti (2014) stated that among the problems and challenges faced by rural communities are limited infrastructures, incapability to buy ICT equipment, lack of knowledge on ICT use, lack of skills, and lack of training in ICT use. Wright (2010) regards ICT as a tool for the economic modernization of a country because to strengthen the economic, financial, marketing, social and political resources, the key to the success and development in today's world is to utilize the use of ICT. According to Camacho (2006), the digital divide is a concept linked through the distribution of ICT. He believed that the use of ICT will build on development opportunities among communities in a country. Nathan (2016) also believed that the use of ICT has great impact on its performance and plays a vital role for economic development in a country. Further, Edgar (2009) agreed that most countries all over the world have taken the opportunity to widen ICT usage in community development.

## Literature Review

### *Issues and Challenges in Using ICT in Rural Communities*

Almost all rural communities in the world have a problem with technology facilities and have not been able to obtain any benefit from the advantages of using ICT (Hasan et al., 2007). Malaysia has introduced various programs to provide internet access in rural areas. Although the rural community has begun to receive ICT technology development, problems or factors that influence the development of ICT in this area are still difficult to overcome completely. According to Zulkhairi, Azizah, Abdul Razak, and Rafidah (2010), the rate of literacy and the rate of broadband penetration in rural areas still remained at a low level of less than one percent. This situation has caused the Malaysian government to strive to enhance their ICT development strategy in rural areas through the National Broadband Initiative (NBI) by assigning RM 12 billion in an effort to enhance the use of ICT strategies in rural communities. Through the NBI, the Ministry of Information Communication and Culture is targeting an increase in the ICT literacy rate in addition to expanding broadband facilities and extending the coverage of internet access in rural areas.

Hosseini, Niknami, and Chizari (2009) reported that there are several challenges faced by rural communities in using ICT such as organizational, technical, financial, and social. For organizational aspects, the factors identified were lack of interest and expertise in using ICT, concerns about the risks of using ICT, low quality of the services provided by the service centre, and the lack of interest by the private sector to participate in the development of ICT for rural areas. Based on the technical aspects, the use of low-bandwidth, hardware shortages, lack of appropriate infrastructure, lack of software and telecommunications

systems, and weak expertise in rural areas in using ICT. Financial challenges involve high costs for the purchase of hardware and software, high costs for internet access, the cost of maintaining the system, the cost for upgrading systems, and the lack of investors to invest in rural areas, from both the public and private sectors. Social factors include the aspect of rural 'technophobes' not wanting to use ICT resulting from rural communities not understanding the benefits and advantages of using ICT. In addition, these factors also influence aspects of regulation through the lack of support from the parties involved, insufficient equipment, and old or inappropriate strategic places to develop ICT activities in rural areas. Furthermore, rural communities also have the lowest level of knowledge of using ICT, lack expertise in handling ICT equipment, and also have rigid thinking against the advantages of ICT. All the above factors clearly show the challenges and problems faced by rural communities and influence the acceptance of using of ICT.

### *Rural Students' Acceptance of Using ICT for Educational Purposes*

According to Walsham and Sahay (2007), in developing countries, the use of ICT helps in the development and growth of a national economy. With the rapid development of ICT in development, countries globally have taken the opportunity to apply technology in raising the living standards of their people. The rapid changes in ICT products have influenced the development of technology used in the educational field (Li, 2016). Ghavifekr and Ibrahim (2015) stated that the integration of ICT in Malaysian classrooms needs serious consideration in order to increase the competency of those enrolled in the country's education system. The development of ICT has changed the teaching and learning process from traditional methods to a technology-based approach. Since the advent of internet technology, there has been a change in the pattern of life of communities and society around the world in education, economics, politics, and socially. AlJeraisy, Mohammad, Fayyumi, and Alrashideh (2015) stated that sharing and collaborating with regard to information can be equally extended to the teaching and learning process. According to Nuurrianti (2016), this is because the use of the internet continues to grow from time to time. Kop (2011) also explained that contributions in educational technology are in terms of the dissemination of learning content without borders and students are able surf the Internet which helps to enhance their understanding of a subject or topic being taught.

Development of information technology and communication has greatly influenced the integration on using technology, particularly in the teaching and learning process. In 2012, the Malaysian Education Development Plan 2013–2025 placed emphasis on the use of information and communication technology in the field of education and 1BestariNet was introduced in all government schools (Ministry of Education, 2016). Correspondingly, the creation of the Smart School initiative in 1999 was a move that expected to provide a widespread application of computer technology in the educational system. The move was expected to bridge the digital divide between all communities

in using technology and also to provide an opportunity for all students to explore, use, and develop various ICT skills.

In the 21st century, emphasis on the use of ICT in the teaching and learning process has considered increasing the potential of ICT to improve the effectiveness of the process (Zhao, 2007). Technology can be used as a valuable tool to promote and strengthen the teaching and learning (T&L) process. Today, some technology tools have been used in T&L activity as two way communication between the students and teachers (Adam & Nel, 2009). Face-to-face or traditional learning can be altered by using ICT in a T&L environment. The findings by Charles and Yidana (2015) indicated that students' ICT competencies were the best predictor of their technology use among students in secondary schools. Learning in this era is not only focused on the teachers, but students themselves need to take the initiative and enhance their knowledge and skills in using technology. In terms of educational aspects, the rural students face many problems and challenges in using ICT. Rural students' acceptance of the use of ICT is an important factor in determining the success of using this technology for educational purposes. Fatema (2013) stated that the success of a technology will not be achieved if the user does not accept and use that technology. This study is important because it will determine the future development of using technology among rural students. The authorities have to plan the proper actions and then can take action to strengthen the use of ICT for rural communities.

Although several studies have applied UTAUT in various organizational and cultural contexts, there is still a lack of studies examining all of its constructs in the rural areas context (Al-Gahtani, Hubona, & Wang, 2007; Birch & Irvine, 2009; Ifinedo, 2012; Im, Hong, & Kang, 2011). Thus, the purpose of this study was to identify the relationship between factors of facilitating conditions, behavioral intentions, social influence, performance expectancy, and effort expectancy with the acceptance of ICT among rural students. The researchers believe that the success of new technology cannot be achieved if the students do not accept and use the technology for educational purposes.

## Methods

Various models and theories have been used to understand the key influences in the acceptance of technology. One of the famous models is UTAUT and it was introduced by Venkatesh, Morris, Davis, and Davis in 2003. UTAUT is a combination of eight theories and models to explain and clarify the level of acceptance of an individual or organization to new technology. This model is an established model to predict the level of acceptance of technology for individuals in an organization because this model can explain 70% of the dependent variables (Jong & Wang, 2009). There are many competing models that have been designed to account for user acceptance of technology. However, the UTAUT model was chosen because it is a combination of eight user acceptance models. The synthesis of the eight models resulted in the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This model was developed based on the Theory of Reasoned Action (TRA) by Fishbein and Ajzen, on the Technology

Acceptance Model (TAM) by Davis, on the Motivational Model, Theory of Planned Behaviour by Ajzen, on the Combined Technology Acceptance Model and Theory of Planned Behaviour by Taylor and Todd, on the Model of PC Utilization by Thompson, on the Innovation Diffusion Theory by Rogers, and on the Social Cognitive Theory by Bandura. These theories that were previously utilized have constructs that were redundant and similar. Thus, Venkatesh, et al., (2003) mapped and integrated these existing models to form a unified model.

The UTAUT model is well suited to the context of this study because this study identifies rural students' acceptance of using ICT for educational purposes. This study did not consider the intermediary factors such as gender, age, experience, and voluntariness because the respondents were all secondary students from rural areas and their backgrounds were similar. These factors are not required in this research study as the researcher did not consider on any of these as being crucial for using ICT for educational purposes. Therefore the researcher eliminated these factors from the study. Thus, the researcher has made some changes to the research model. UTAUT suggests four constructs or factors to predict acceptance of the use of a technology among others, such as performance expectancy (JP), effort expectancy (JU), social influence (PS), and the facilitating conditions (CM) (Keller, 2005).

According to Venkatesh et al. (2003), the performance expectancy (JP) factor refers to the level of an individual's belief that by using a new technology it is possible to improve career performance. The effort expectancy (JU) factor refers to an individual's perception of the degree to which technology is easy to use with self efficacies. The social influence (PS) factor refers to an individual's perception that the perception of others is important and can act as a motivator to use the new technology. Facilitating conditions (CM) refer to the level that an individual believes that organizational and technical infrastructure exists to support the use of a system. Behavioral Intention (KT) refers to the behavior shown by an individual on a voluntary basis and can be used to predict the tendency of the individual and it is the result of feedback from JP, JU, and PS.

Each main factor will be placed more than one variable. KT use technology is the desire to use the ICT tools. It is influenced by three factors: JP, JU, and PS. Behavioral intention for the use of an ICT is determined by the usage rate of its users. It is the end result after all the factors and the intermediaries mutual act. In this study, the performance expectancy (JP) factor refers to the use of ICT for educational purposes among rural students and this will increase if this technology can improve their academic performance in the future. The effort expectancy (JU) factor refers to ICT usage among rural students and this will increase if they believe this technology is easy to use. The social influence (PS) factor refers to the use of ICT and will increase among rural students if they are influenced and encouraged by friends or anyone in the area. Further, facilitating conditions (CM) in this study refer to the use of ICT that will increase among rural students if the infrastructure facilities and technical support for new technology are available.

## Data Collection

A purposive sampling technique was used in sample selection for this research. Purposive sampling was done to fulfill the research purpose which could not be achieved by using other sampling technique (Sidek, 2002). According to Silverman (2000), purposive sampling is a sampling technique that provide much information related to the study. The data were gathered from 450 secondary students from more than 10 rural schools in a rural district in Malaysia. Their ages were between 13 and 17 years. They were selected because they had a lack of exposure to using ICT, they were not familiar with the use of ICT, specifically in teaching and learning process at school, and they volunteered to participate in this study. The respondents were invited to attend a workshop from 8 am to 5 pm which was held at a community centre in a rural area and the instructor introduced the use of ICT for educational purposes.

Siti (2014) argued that people in rural areas are disadvantaged in the use of ICT technologies due to various problems such as lack of interest and expertise in using ICT and lack of appropriate infrastructure. This study focused on the use of ICT (digital technology) as a platform for supporting the T&L process. Digital technologies used in this study were a laptop, LCD, YouTube (video), and Microsoft Word/PowerPoint. These technologies were selected because according to Shelly, Cashman, Gunter, and Gunter (2004), among the basic components of ICT in teaching and learning are the computer, Liquid Crystal Display (LCD), printer, radio, television, and software such as Ms Word, Ms PowerPoint and electronic spreadsheets, and the Internet. Thus, researchers believe that these technologies were suitable to be introduced to rural students.

## Data Analysis

The questionnaire used in this study was modified from the items of Venkatesh et al. (2003) to better suit the context of the study. Based on Venkatesh et al., (2003), the questionnaire consisted of 20 items and used a seven-point Likert scale. The reliability of the instrument was measured using Cronbach's Alpha for each construct. All constructs had internal consistency reliability, higher than .7 which indicates that the items used to measure that construct were adequate and reliable. The results are shown in Table 1.

The questionnaire data were analyzed using the descriptive statistics in the SPSS software version 17. Data responses were analyzed based on the mean (*M*) and

standard deviation (*SD*) and correlation analysis. Descriptive analysis (means and standard deviations) was used to determine the differences among rural students' acceptance in using ICT based on UTAUT model. The use of correlation analysis in this study measured the degree to which a change in the independent variable will result in a change in the dependent variable.

## Results and Discussion

Means and standard deviations were used to determine the differences between the rural students' acceptance in using ICT based on UTAUT model. This analysis is appropriate to be used to analyze the value of mean scores that differ significantly. In this analysis, the level of significance used was .05 at the confidence level of 95%. Based on Table 2, the means and standard deviations for each construct were compared to determine whether any significant differences existed based on the UTAUT model regarding three factors: JP, JU, and PS. The research findings showed that on the whole, the mean values for each construct exceeded 2.50. This showed that the respondents had a positive view of accepting the use of ICT for educational purposes. Comparing between constructs, the majority of the students had higher mean values and standard deviations for facilitating conditions, followed by social influence, performance expectancy, and effort expectancy. Venkatesh et al. (2003) reported that performance expectancy is the most influential construct based on his UTAUT model; however, the current study found that facilitating conditions were more influential in using ICT among rural students. Although the Malaysian government provides many initiatives to ensure that rural communities benefit from the use of ICT, the communities still face many challenges in using the ICT facilities. As the facilitating condition factor was more influential regarding use of ICT among rural students, the researchers suggest that the government should increase the infrastructure and ICT facilities in rural areas. Acacia (2000) stated that various ICT facilities should be introduced to communities in rural areas since the development of ICT technology is capable of changing the growth of the country's economy.

Table 3 shows a summary of the Spearman correlation analysis to examine the relationship among the UTAUT factors. Based on Table 3, there is a relationship between facilitating conditions, social influence, performance expectancy, and effort expectancy with behavioral intention. From the students' responses, it was clear that the students do relate facilitating conditions, social influence, performance expectancy, and effort expectancy with the usage of ICT for educational purposes. Musa (2010) also stated that

**Table 1**  
Reliability of each construct

Variable	Cronbach's alpha	Result
Performance expectancy	.822	Reliable
Effort expectancy	.824	Reliable
Social influence	.852	Reliable
Facilitating conditions	.810	Reliable
Behavioral intention	.834	Reliable

**Table 2**  
Comparison of means and standard deviation between each factor

Factor	Mean (standard deviation)
Performance expectancy	2.69 (.54)
Effort expectancy	2.67 (.44)
Social influence	2.77 (.46)
Facilitating conditions	2.89 (.56)



**Table 3**  
Correlation analysis to examine the relationship among the UTAUT factors

		JP	JU	PS	CM	KT
Performance expectancy (JP)	S	.138	.288	.321	.432	.578
	CF	.257	.390	.456	.566	.651
Effort expectancy (JU)	S	.288	.138	.689	.790	.020
	CF	.390	.257	.764	.853	.645*
Social influence (PS)	S	.321	.689	.138	.981	.033
	CF	.456	.764	.257	.901	.490*
Facilitating conditions (CM)	S	.321	.689	.138	.981	.017
	CF	.456	.764	.257	.901	.742*
Behavioral intentions (KT)	S	.578	.020	.033	.017	.138
	CF	.651	.645*	.490*	.742*	.257

\*S = Significant (2-tailed), CF = Correlation coefficient, Correlation is significant at the .05 level (2-tailed)

ICT plays an important role in community life because it is capable of improving effectiveness and raising the daily standard of living in the community. Thus, these constructs such as facilitating conditions, social influence, performance expectancy, and effort expectancy may be considered as influential factors and impact the acceptance by rural students of using ICT according to the UTAUT model.

## Conclusion and Recommendation

The issues of community participation are still among the main challenges for the Malaysian government, particularly the Ministry of Education. As a developing country, Malaysia has adopted numerous alternatives to expand the use of ICT among all members of the community. The use of technology for education in Malaysia started in the 1970's, with the use of microcomputers, which had a large impact in the field of education (Johari & Zaliza, 2010). The current findings suggest that on the whole, rural students agreed that the facilitating condition factor was more influential in using ICT for educational purposes. Herselman (2003) also agreed that by using new technologies, rural communities can explore new ICT applications, become more ready to use ICT in their daily lives, and be able to master the use of ICT skills in the future.

The findings of this research could help make recommendations to the Malaysian Education Technology Division. Schools and teachers also must take the necessary steps to enhance their strengths and improve weaknesses in using ICT for educational purposes. To increase the use of ICT in the T&L process, the researchers suggest the government should introduce many education programmes to rural students in order to encourage them to use ICT for educational purposes. According to Siti (2014), education programs which integrate the use of technology are able to produce rural students who are ICT literate and able to keep pace with the globalization of the world. Since the use of ICT has a major impact on a country's economic development, the various parties need to ensure that the development of ICT can benefit all communities, especially in rural areas. Jensen and Esterhuysen (2001) stated that rural communities need to increase their awareness and understanding of the effectiveness of using ICT to improve the standard of living and economic status of a society. Rural

students need to understand that the use of ICT for educational purposes is able to improve their academic performance in the future. According to Mohd (2010), the role played by ICT in society is the dissemination of knowledge and information that is appropriate specifically for rural communities. Thus, in this study, rural students believed that the ICT is easy to use and had influenced them to use ICT tools in the future.

This situation also clearly reflects the problems faced by rural communities in empowering the use of ICT in rural areas. According to Balakrishnan (2002), the use of ICT can increase the knowledge, skills, opportunities in employment, and income, and also assist in increased networking. Doris, Abdul, Norlida, Redzuan, and Siti (2012) stated that education plays an important role in improving a country's economic growth and also increasing knowledge and skills for a better life. Thus, authorities need to prepare the appropriate technology equipment before any new technology is introduced to rural students. Future research is recommended to focus on rural students' learning style, engagement, and interaction and also the research should be carried out using other methods such as experimental research and design and development research, to survey the acceptance of using ICT in the teaching and learning process.

## Conflict of Interest

There is no conflict of interest.

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