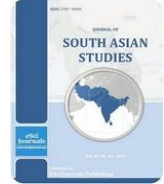




Available Online at ESci Journals

# Journal of South Asian Studies

ISSN: 2307-4000 (Online), 2308-7846 (Print)  
<http://www.escijournals.net/JSAS>



## COMPARISON OF E-LEARNING ACCEPTANCE AMONG POSTGRADUATE STUDENTS IN SRI LANKA AND MALAYSIA

<sup>a</sup>Kaushalya Yatigammana\*, <sup>b</sup>Md. Gapar M. Johar, <sup>c</sup>Chandra Gunawardhana

<sup>a</sup>Department of Commerce & Financial Management, University of Kelaniya, Kelaniya, Sri Lanka.

<sup>b</sup>Academic Department, Management & Science University, Malaysia.

<sup>c</sup>Open University, Sri Lanka.

### ABSTRACT

The purpose of this study was to compare the impact of innovation attributes on postgraduate students' e-learning acceptance between Sri Lanka and Malaysia. The Diffusion of Innovation theory identifies five attributes of innovation namely relative advantage, compatibility, complexity, trialability, observability which impact for the attitude and intention of using e-learning. Sri Lanka and Malaysia are the countries which have more similarities in terms of history, geography and culture. Therefore, a comparison between Sri Lanka and Malaysia for the innovation attributes towards the attitude and intention of using e-learning is more relevant as to acquire the knowledge on how economic and technological development have an impact on postgraduate students' preferences. A random sample of 400 was drawn from the postgraduate students in locally based universities in Sri Lanka and Malaysia. It was found that Sri Lanka and Malaysia has similar in e-learning acceptance in terms of observability and relative advantage which has a significant impact on attitude and intention of using e-learning and also complexity and trialability was the least significant factors on e-learning acceptance in both Sri Lanka and Malaysia. This is the first attempt of comparing e-learning acceptance between Sri Lanka and Malaysia and discloses information on how Sri Lanka and Malaysia differ. The findings of this paper can be used by the higher educational institutions in Sri Lanka and Malaysia when implementing e-learning solutions.

**Keywords:** e-learning, Postgraduate, Sri Lanka, Malaysia, Innovation Attributes, Acceptance.

### INTRODUCTION

The teaching and learning activities have been developed with parallel to the technological developments. In the digital age, electronic media are mainly used to disseminate knowledge. The Ministry of Education in New Zealand defines e-learning as "learning that is enabled or supported by the use of digital tools and content. It typically involves some form of interactivity, which may include online interaction between the learner and their teacher or peers. E-learning opportunities are usually accessed via the internet, though other technologies such as CD-ROM are also used in e-learning" (Ministry of Education New Zealand, 2009). E-learning facilities can be in either synchronous or asynchronous form. Asynchronous

e-learning is where the teaching and learning takes place even when the participants cannot be online. Though the users can still access to information and content and download them send feedbacks to the instructors via email, discussion boards, blogs, discussion forums etc. In contrast to this synchronous learning is real time interaction between the learner and the instructor through videoconferencing, teleconferencing chat, instant messaging etc (Hrastinski, 2008: 51; Koller, Harvey, and Magnotta, 2001: 15-16). Therefore e-learning is a very advantageous method of accessing geographically dispersed users easily with the use of technology.

Nowadays most higher educational institutions in Sri Lanka and Malaysia are offering e-learning facilities. E-learning is now becoming popular in Sri Lanka and many higher educational institutes are now adopting e-learning to access the remote users. On the other hand it

\* Corresponding Author:

Email ID: \*kaushimail@yahoo.com

© 2014 ESci Journals Publishing. All rights reserved.

was found that though higher educational institutes implementing e-learning solutions, their usage of such systems are not fairly good (Gunawardana and Ekanayaka, 2009: 15; Gunawardana and Pathirana, 2011: 113). Further it is understood that Malaysia is a country with e learning is more popular than Sri Lanka. It is known that both Sri Lanka and Malaysia has similarities in terms of location, history and had a similar socio economic status after the independence. Sri Lanka is one of the top countries in Asia in terms of healthcare, education, widespread of English language usage, trained human capital in the field of accountancy. However, Malaysia developed more rapidly than Sri Lanka with the consistent political policies and was able to gain considerable economic growth. Therefore, it is suitable of making a comparison between Sri Lanka and Malaysia as these two countries were similar in the past yet Malaysia showed a substantial growth than Sri Lanka. Therefore, a comparison with Malaysian postgraduate students' acceptance of e-learning is also to be made as to identify the lessons learnt by these two countries.

The past studies done in abroad found that the online MBA courses are attracted adults over 35 years of age, females, part time, married students (Cao, 2010: 2). Majority of the postgraduate students in Sri Lanka and Malaysia are engaged in learning while they are working and thus physically appearing in a class room is rather difficult to them.

In view of the fact that the postgraduate studies are mainly followed by the individuals who are working fulltime, geographically dispersed than undergraduates and with other obligations to fulfill such as commitment to families and social lives, and also as they possess a different set of characteristics, there is a requirement for more flexible postgraduate courses offering with the help of the technology to address the needs of that particular clientele which allow them to obtain necessary qualifications overcoming the barriers. It is also found that higher educational institutions have also benefited from virtual classrooms as their cost can be reduced.

Rogers' Diffusion of Innovation theory (DOI) has been used in many fields such as agriculture, medicine and ICT to measure the adoption of new innovations. Surry (1997) explained that using diffusion theories in educational technologies are important for the such reasons as:

- To understand the factors that affect the adoption of innovation which either impedes or supports diffusion,
- Since educational technology is an innovative method, by identifying diffusion theory the adopters can work more efficiently.
- Both instructional technology and diffusion of innovation models have a systemic process of designing diffusion of model that can be used to design the instructional technology.

Therefore, ICT adoption in the education field can be measured using DOI theory as it is a new innovation in the field of education (Goktalay and Ocak, 2006: 38; Li, 2004: 10; Perkins, 2011: 60; Surry, 1997; Usluel, Aşkar, and Baş, 2008: 262).

Thus, the objectives of this study are to compare the impact of innovations attributes on attitude of using e-learning in Sri Lanka and Malaysia and to compare the impact of innovations attributes on intention of using e-learning in Sri Lanka and Malaysia.

#### **E-LEARNING DEVELOPMENT IN SRI LANKA**

The Open University of Sri Lanka (OUSL) is a pioneering higher education institute in Sri Lanka in providing distance education since its inception in 1980 and now OUSL offers its programmes using ICT such as providing audio and video self-study materials, email communication, virtual class room sessions etc (PANdora: Distance and Open Resource Access, 2009). The School of Computing of the University of Colombo was introduced the e-learning Centre (eLC) in late 2002 to provide e-learning services to undergraduate and graduate students. Currently eLC offers courses through e-learning to its undergraduate and postgraduate students. In 2003, Sri Lanka Distance Learning Centre (DLC) opened under a World Bank project and it facilitates to connect Sri Lanka with 50 international DLCs via worldwide video conferencing system. National Online Distance Education Service (NODES) operating under the Ministry of Higher Education facilitates and coordinates online distance learning programme development in educational institutes in Sri Lanka. NODES is linked with Sri Lankan mobile operator Mobitel to use m-learning facilities with the view of overcoming geographical discrepancies when disseminating higher education throughout the country ([www.nodes.lk](http://www.nodes.lk)). As a pioneer in introducing state-of-art technology, University of Colombo offers Postgraduate Diploma in Business Management and Executive

Diploma in Marketing through m-learning facilities. University of Moratuwa also offers Bachelor of Information Technology programme for the external students through online. University of Kelaniya offers Master of Business programme through m-learning mode.

#### **E-LEARNING DEVELOPMENT IN MALAYSIA**

The Government of Malaysia promotes the ICT sector through the implementation of Malaysia plans introduced by time to time. Under the 6<sup>th</sup> Malaysia Plan the National Information Technology Council has been established and the more stress has been put on the development of the manufacturing sector through ICT. Under the 7<sup>th</sup> Malaysia Plan, the National Information Technology Agenda was formed and the Multimedia Super Corridor (MSC) Project was launched to attract the best ICT companies to Malaysia. Under the 7<sup>th</sup> Malaysia Plan, the Multimedia University was established to develop human capital and promote research on ICT and multimedia. The 8<sup>th</sup> Malaysia Plan has given priority to expand ICT among general public and rural communities. Under this, cellular telephony, internet and broadcasting technologies were integrated. The 9<sup>th</sup> Malaysia Plan prioritizes the further expansion of ICT by reducing the digital divide, development of cyber cities and encourages new sectors such as bioinformatics (Strategic ICT Roadmap for Malaysia, 2007).

In 2000, Malaysia established the National e-learning Centre (NELC) with the view of promoting research and development, to promote and increase the awareness of e-learning, advisory and consultancy and develops e-learning standards. The Open University Malaysia and University Tun Abdul Rasak are the pioneers of providing e-learning programs in Malaysia. As to date many other Malaysian universities such as, Multimedia University, University Pendidikan Sultan Idris, University Malaysia Sarawak, University of Malaya, University Utara Malaysia offer e-learning facilities for the students.

Apart from that the Asian e university (AeU) has been set up in Malaysia under Asia Cooperation Dialogue (ACD) of which Sri Lanka also has been a member. AeU was established in Malaysia after the ACD Ministerial meetings held in Islamabad 2005 and Doha 2006. It offers Bachelors and postgraduate programmes around the world through the e-learning mode.

#### **LITERATURE REVIEW**

**Rogers' Model of Diffusion of Innovation:** According to Rogers (2003) the innovation decision process contain five stages namely, knowledge, persuasion, decision, implementation and confirmation. In the knowledge stage person searches for information on innovation based on what, how and why terms. Probably an individual attempts to ask what the innovation is and how and why it works. Rogers describes it as awareness knowledge, how to knowledge and principles knowledge. In the second stage of innovation process, i.e. in the persuasion stage an individual may build either a negative or a positive attitude towards the innovation. Since Rogers describes the innovation diffusion process as 'an uncertainty reduction process' the process attributes that are discussed under the persuasion stage help to decrease the uncertainty on innovation. The attributes that are discussed in this stage are relative advantage, compatibility, complexity, trialability and observability.

Rogers explains relative advantage as the "degree to which an innovation is perceived better than the ideas it supersedes" (Roger, 2003: 229). Relative advantage is measured in terms of economics, social prestige, convenience and satisfaction. Also motivational aspects, demand, value are the most hunted advantages that an individual seeks. As per Rogers, Compatibility is the "degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters (Roger, 2003: 240). The Compatibility dimensions include to what extent an innovation fits the values, beliefs, previous ideas and needs of the users (Perkins, 2011 page 64). Individual's negative attitude towards IT may be affected by the lack of compatibility (McKenzie, 2001: 4). Rogers define Complexity as 'the degree to which an innovation is perceived as relatively difficult to understand and use' (Roger, 2003: 257). If the complexity of the innovation increases the adoption is decreased. In instructional technology, complexity depends on the producers' capability of designing the materials and how the content adheres to the best practices (Perkins, 2011: 65). As Rogers defines, trialability is 'the degree to which an innovation may be experimented with on a limited basis' (Roger, 2003: 258). More the innovation is tried the faster the adoption is. If an institution publishes its materials to the world at large and if it is to be useful, allowing a trial basis for the users would be effective and also problems can be solved before

they get worsen (Perkins, 2011: 65). According to Rogers observability is "the degree to which the results of an innovation are visible to others" (Roger, 2003: 258). If the results are visibly observable by people then the adoption is increased.

According to the above model of Rogers' DOI, persuasion stage of the innovation decision process explains the individuals' adoption for the acceptance of the innovation. Therefore, the innovation attributes that are discussed in the persuasion stage are mainly beneficial to ascertain the attitude of e-learning adoption of the students.

Rogers's diffusion of innovation has been tested by many studies on users' technological adoption and various conclusions have been made in different contexts.

According to Liao and Lu (2008: 1413) perceived compatibility positively influences the students' intention to use e-learning and trialability is negatively related with e-learning adoption. Further it found that perceived e-learning advantage; complexity and observability have no significant effect on students' intent of adoption of e-learning. As per Duan, et al., (2010: 243) only the perceived compatibility and trialability have a significant influence on e-learning adoption among the Chinese undergraduates. Another Chinese study done on e-learning adoption of undergraduates, found the most influential factors for e-learning adoption was found to be pricing under relative advantage, education quality under compatibility, IT equipment under complexity and flexibility under relative advantage (Zhang, Wen, Li et al., 2010: 1430). Fu et al., (2010: 612) found perceived e-learning relative advantage, compatibility, trialability and observability have a significant positive influence on students' e-learning adoption and that perceived level of complexity has no significant effect on students' e-learning acceptance. Similar findings were derived by Al-Gahatni (2003: 66) where relative advantage, compatibility, trialability and observability shows a positive signification correlation with computer technology adoption in Saudi Arabian knowledge workers and complexity shows a negative relation with computer adoption.

Further, Ayodele et al (2013) found that relative advantage is the strongest influence factor for behavioral intention of using mobile payment in Nigeria while Yatigamma et al (2013) found relative advantage and observability as the strongest significant factors towards behavioral intention of e-learning in Sri Lankan

postgraduate students. Liaw and Chen (2013) found that relative advantage and compatibility has a significant positive impact on intention of using virtual fitting rooms among online shoppers.

The researchers also made attempt to find out the impact between innovation attributes and attitudes of using technologies, because attributes of innovation would have been an effect on changing the attitude of a person before altering the behavioral intention of the users. A study conducted to measure the impact of innovation attributes on the attitude of information technology of the lecturers in the National University of Lesotho has concluded that relative advantage, complexity and observability has a positive influence and observability found to be the highest influenced attribute. Further this study found that compatibility and trialability do not contribute for the attitude of using information technology (Ntemana and Olatokun, 2012: 190).

A study done among USA citizens on their attitude for using internet for voting has revealed that relative advantage has a positive impact on attitude towards using internet for voting and compatibility was not a significant factor (Carter and Campbell, 2011: 36). Nor and Pearson (2007: 8) found that relative advantage and trailability has a significant positive impact on attitude towards using internet banking among Malaysian postgraduate students and compatibility is not a significant positive impact factor on attitude on using internet banking. It further found that attitude of using internet banking has a significant positive impact on intention of using internet banking.

A study done in Jos, Plateau state in Nigeria on Automated teller Machines adaptation in among the citizens found that relative advantage, complexity, compatibility, trialability and observability has a significant impact on attitude on using ATM which in turn has a significant impact on intention of using technology. Among them observability has the highest impact on attitude while trailability was the least impact factor on attitude (Olatokun and Igbinedion, 2009: 386). Similarly Putzer and Park (2010) found that observability and compatibility are the significant factors which contribute for the attitude of using Smartphone among the nurses in Southeastern hospitals in United States.

A study done among Taiwanese potential internet bank users on the attitude of using internet banking had found that relative advantage and compatibility has a positive

significant impact on attitude of using internet banking which in turn has an impact on intention (Lin, 2011: 257). A Malaysian study done on consumer attitudes on online shopping found that relative advantage and compatibility has a significant impact on attitude while complexity is not a significant predictor of attitude towards using online shopping (Zendehdel and Paim, 2013: 499). Folorunso(2010: 370) concluded that relative advantage and complexity did not show a significant impact on attitude but compatibility, observability and trialability have a positive significant impact on attitude of using social network sites of the students in Nigerian universities. They further elaborated that though students see speed, availability, ease of use in other social network sites they do not like to switch from one network to the other network. Therefore relative advantage does not provide any significant effect on attitude. It also found that social network sites are not easy to use and not

widely spread. Therefore contribution of complexity is also found to be insignificant. The observability of the technology was affected from the others perception and influence. The trialability shows a higher significance towards the attitude of using technology, because students have already tested the trialability of the site and perceived it as high. It is also found that innovation attributes are significant determinants of internet banking attitude of the users (Zolait, 2009: 11).

According to the literature on past studies done on DOI theory and technology acceptance, five main variables can be identified as relative advantage, compatibility, complexity, trialability and observability which as innovation attributes which affect for the technology acceptance i.e. intention and attitude of using technology.

**THE CONCEPTUAL FRAMEWORK**

The following conceptual framework is derived based on the literature survey.

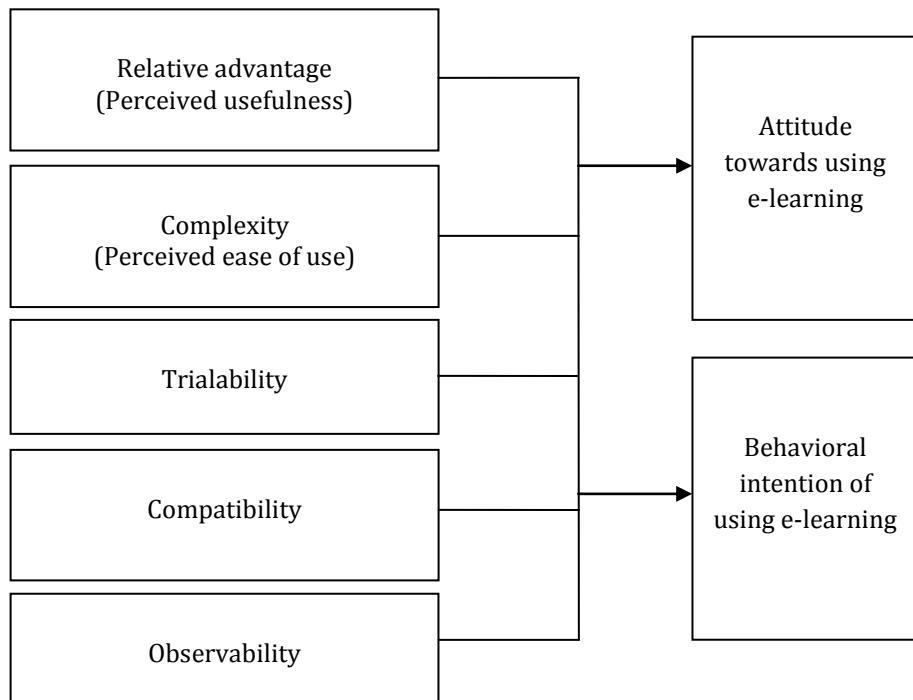


Figure 1. The Conceptual Framework.

**METHODOLOGY**

The G Power software was used to determine the sample size for the study (Cunningham JB and McCrum-Gardner E, 2007; Faul Franz, Ider Edgar Erdfe, Buchner Axel et al., 2009). Based on the number of independent variables (5) and the regression procedure used for the data analysis the maximum required sample was 187. Therefore 400 questionnaires were distributed among the postgraduate students who are registered in the

universities for year 2010/2011 and 2011/2012. The sample was randomly drawn from the locally based universities in Sri Lanka and Malaysia. In Sri Lanka 191 questionnaires and in Malaysia 199 questionnaires were duly filled respectively and they were taken for the analysis. The reliability of the variables are been tested using Cronbach’s alpha and all the variables are shown a good level of reliability in Table 1.

Table 1. Statistics of the variables.

Construct	Variables	Sri Lanka			Malaysia		
		Mean	SD	Cronbach's alpha	Mean	SD	Cronbach's alpha
Perceived relative advantage	Cost	3.54	.887	.845	3.45	.897	.890
	Flexibility	3.67	.809		3.73	.802	
	Adoptability	3.62	.830		3.54	.851	
	Self-paced learning	3.79	.787		3.68	.769	
	Accessibility	3.71	.800		3.78	.738	
	Efficiency	3.50	.858		3.60	.816	
	Effectiveness	3.53	.899		3.56	.826	
Source: (Duan et al., 2010: 241)	Learning experience	3.62	.921	3.59	.804		
	General advantage	3.31	1.028	3.40	.915		
Perceived compatibility	Compatible to perception	3.58	.866	.735	3.49	.846	.917
	Disadvantage with traditional learning	3.50	.911		3.41	.805	
	Suitability to learning style	3.61	2.236		3.35	.968	
	Suitability to life style	3.45	.949		3.24	.948	
	Suitability to personality	3.49	.911		3.24	.928	
Source: (Duan et al., 2010: 241)	Meet Career goals	3.52	.876	3.31	.961		
	Meet Learning needs	3.60	.906	3.35	.925		
Perceived complexity	Knowledge requirement	3.01	1.069	.885	3.28	.937	.897
	Technology awareness	3.28	.948		3.39	.913	
	Complex to use	2.90	1.044		3.23	.973	
	Requires mental effort	3.10	1.010		3.37	.917	
	Difficult to understand the system	2.76	1.027		3.16	.961	
Source: (Duan et al., 2010: 241)	Overall difficulty	2.82	1.061	3.16	1.012		
Perceived trialability	Trying of Software	3.57	.836	.873	3.43	.884	.887
	Try demonstrations	3.58	.822		3.48	.777	
	Opportunities to look at content	3.62	.778		3.54	.736	
	Opportunities to try services	3.55	.838		3.51	.758	
Source: (Duan et al., 2010: 241)	General trialability	3.51	.864	3.51	.790		
Perceived Observability	Benefits of e learning can be demonstrated	3.73	.656	.811	3.64	.718	.779
	Chances to know benefits	3.75	.761		3.71	.706	
	Benefits of e learning are apparent	3.61	.759		3.60	.717	
	Ability to tell benefits of e-learning	3.68	.773		3.57	.806	
Attitude	e learning is a good idea	3.83	.770	.906	3.72	.828	.898
	E learning is a wise idea	3.74	.803		3.59	.883	
	like the idea of using e learning	3.77	.794		3.73	.891	
	e learning would be a pleasant experience.	3.75	.795		3.74	.889	
Intention	use e-learning for education when available	3.80	.669	.852	3.63	.792	.880
	use e learning in education as often as needed	3.74	.684		3.54	.845	
	use e learning in education frequently	3.67	.802		3.54	.875	
	Whenever possible use e-learning for education	3.71	.717		3.53	.886	
Source: (Chen and Chou, 2010: 302)	use e learning in education routinely	3.72	.755	3.38	.879		

**RESULTS AND DISCUSSION**

According to the data collected from Sri Lanka and Malaysia, the Table 2 shows the background information of the respondents of Sri Lanka and Malaysia. According to the Table 2 the age groups of the respondents of two countries are more similar, i.e. the majority of the respondents are from the age between 19 years and 40 years. In Sri Lanka majority of the respondents are male while in Malaysia more female respondents. In both countries majority of the respondents are single. In Sri Lanka majority of the respondents are on arts stream and in Malaysia majority are from management and science stream. In both countries majority of the respondents have the first degree and majority are enrolled in the public universities. In Sri Lanka majority of are working in the education sector while in Malaysia majority are working in IT sector. Respondents of both countries sated that their computer expertise as intermediate.

**Objective 1:** Compare the impact of innovations attributes on attitude of using e-learning in Sri Lanka and Malaysia.

According to the Table 3, the R-squared of 0.422 in Sri Lanka implies that the five predictor variables explain about 42.2% of the variance/variation in the attitude.

**Table 3.** Model Summary

	R Square	F	Sig.
Sri Lanka	.422	27.063	0.000
Malaysia	.335	19.484	0.000

In Malaysia R-squared of 0.335 implies that the five predictor variables explain about 33.5% of the variance/variation in the attitude. In Sri Lanka the ANOVA revealed that the F-statistics ( $F = 27.063$ ) in Sri Lanka is very large and the corresponding p-value is highly significant (0.000) or lower than the alpha value of 0.05.

In Malaysia the ANOVA revealed that the F-statistics ( $F = 19.484$ ) is very large and the corresponding p-value is highly significant (0.000) or lower than the alpha value of 0.05. This indicates that the slope of the estimated linear regression model line is not equal to zero confirming that there is linear relationship between attitude of using e-learning and the five predictor variables. The largest beta coefficient in both Sri Lanka and Malaysia is for observability which is 0.267 and 0.243 respectively, as depicted from table no. 4.

Table 2. Background information of the respondents.

	Sri Lanka %	Malaysia %
<b>Age</b>		
12-18 yrs	1.0	3.5
19-30 yrs	71.2	65.3
31-40 yrs	21.5	14.6
41-55 yrs	5.8	16.6
56-65 yrs	.5	-
<b>Gender</b>		
male	60.2	44.2
female	39.8	55.8
<b>Marital status</b>		
single	68.1	68.8
married	31.9	31.2
<b>programme of study</b>		
management	13.6	26.6
arts	26.7	3.0
engineering	10.5	4.5
medicine	1.0	15.1
education	7.9	12.1
science	13.1	26.6
IT	18.8	3.0
other	8.4	9.0
<b>Highest education completed</b>		
professional exams	2.6	1.0
diploma	2.6	.5
First degree	77.5	72.4
PG degree	16.2	25.6
PhD	1.0	.5
<b>Enrolled university type</b>		
Public	83.8	53.8
Private	16.2	46.2
<b>Current employment</b>		
Education	39.8	26.6
Managerial	12.0	17.1
Medical	1.6	13.6
engineering	11.5	3.5
IT related	15.7	31.2
Other	17.8	8.0
Without job	1.6	-
<b>Level of computer expertise</b>		
Beginner	13.6	11.1
Intermediate	66.5	63.8
Expert	19.9	25.1

Table 4. Regression analysis for the dependent variable attitude.

Country	Dimensions	Unstandardized Coefficients	Std. Error	Beta(Standardized Coefficients)	t	p-value
Sri Lanka	(Constant)	3.105	1.277		2.432	.016
	Relative advantage	.161	.043	.303	3.740	.000*
	Compatibility	.078	.047	.144	1.666	.097
	complexity	-.032	.034	-.057	-.942	.347
	trialability	.084	.065	.102	1.290	.199
Malaysia	observability	.267	.101	.226	2.643	.009*
	(Constant)	2.657	1.454		1.827	.069
	Relative	.210	.049	.373	4.331	.000*
	Compatibility	.085	.049	.146	1.743	.083
	complexity	.025	.040	.039	.636	.526
	trialability	-.040	.066	-.043	-.610	.542
	observability	.243	.096	.182	2.538	.012*

\*P <0.05 level.

This means that this variable makes the strongest unique contribution to explaining the dependent variable (attitude) when the variance explained by all other predictor variables in the model is controlled for. It suggests that one standard deviation increase in observability is followed by 0.267 standard deviation increases in attitude of using e-learning mode in Sri Lanka and 0.243 increases in Malaysia. The Beta value for relative advantage is the second highest (0.161, 0.210) in both countries. The third highest Beta value in Sri Lanka is for trialability (0.084) while compatibility (0.085) in Malaysia.

The beta value for compatibility is the fourth highest (0.078) in Sri Lanka and complexity (0.025) in Malaysia. The Beta value for complexity in Sri Lanka is the smallest (-0.032) and trialability (-0.040) in Malaysia indicating that it made the least contribution. The negative symbol indicates negative linear relationship between the predictor and the dependent variable. It means that one standard deviation increase in complexity in Sri Lankan users is followed by 0.032 standard deviation decrease in attitude towards using e-learning. In Malaysia one standard deviation increase in trialability of the users is followed by 0.04 standard deviation decreases in attitude towards using e-learning.

**Objective 2:** Compare the impact of innovations attributes on intention in Sri Lanka and Malaysia.

Table 5. Model Summary.

	R Square	F	Sig.
Sri Lanka	.390	23.618	0.000
Malaysia	.339	19.804	0.000

According to the Table 5, the R-squared of 0.390 in Sri Lanka implies that the five predictor variables explain about 39% of the variance/variation in the intention. In Malaysia R-squared of 0.339 implies that the five predictor variables explain about 33.9% of the variance/variation in the attitude. In Sri Lanka the ANOVA revealed that the F-statistics ( $F = 23.618$ ) in Sri Lanka is very large and the corresponding p-value is highly significant (0.000) or lower than the alpha value of 0.05. Also in Malaysia the ANOVA revealed that the F-statistics ( $F = 19.804$ ) is very large and the corresponding p-value is highly significant (0.000) or lower than the alpha value of 0.05. This indicates that the slope of the estimated linear regression model line is not equal to zero confirming that there is linear relationship between attitude of using e-learning and the five predictor variables.

The largest beta coefficient in both Sri Lanka and Malaysia is for observability which is 0.393 and 0.348 respectively as shown in table 6. This means that this variable makes the strongest unique contribution to explaining the dependent variable (intention) when the variance explained by all other predictor variables in the model is controlled for. It suggests that one standard deviation increase in observability is followed by 0.393 standard deviation increase in attitude in Sri Lanka and 0.348 increases in Malaysia. The Beta value for relative advantage is the second highest (0.135, 0.219) in both countries. The third highest Beta value in Sri Lanka and Malaysia is for compatibility (0.077, 0.092). The beta value for trialability is the fourth highest (0.019) in Sri Lanka and complexity (0.029) in Malaysia.



Table 6. Regression analysis for the variable intention.

Country	Dimensions	Unstandardized Coefficients	Std. Error	Beta(Standardized Coefficients)	t	p-value
Sri Lanka	(Constant)	6.416	1.355		4.733	.000
	Relative advantage	.135	.046	.246	2.954	.000*
	Compatibility	.077	.049	.138	1.553	.122
	complexity	-.011	.036	-.018	-.292	.770
	trialability	.019	.069	.022	.274	.784
	observability	.393	.107	.322	3.666	.000*
Malaysia	(Constant)	3.038	1.670		1.819	.070
	Relative advantage	.219	.056	.337	3.923	.000*
	Compatibility	.092	.056	.136	1.633	.104
	complexity	.029	.046	.038	4.733	.528
	trialability	-.014	.076	-.013	-.189	.850

\*P<0.05

The Beta value for complexity in Sri Lanka is the smallest (-0.011) and trialability (-0.014) in Malaysia indicating that it made the least contribution. The negative symbol indicates negative linear relationship between the predictor and the dependent variable. It means that one standard deviation increase in complexity in Sri Lankan users is followed by 0.011 standard deviation decrease in intention towards using e-learning. In Malaysia one standard deviation increase in trialability of the users is followed by 0.014 standard deviation decreases in intention towards using e-learning.

Based on the Table 7 of collinearity diagnostic obtained, none of the model dimensions has condition index above the threshold value of 30.0, none of tolerance value smaller than 0.10 and all VIF statistics are less than 10.0. This indicated that there is no serious multicollinearity problem among the predictor variables of the model. Since there is no multicollinearity problem between the predictors included in the final model and the assumptions of normality, equality of variance and linearity are all met, hence, it is reasonable to conclude that the estimated multiple regression models to explain attitude is stable, good and quite respectable.

Table 7. Corlinearity Diagnostics of the Variables.

Country	Dimension	Eigenvalue	Condition Index	(Constant)	Collinearity Statistics	
					Tolerance	VIF
Sri Lanka	1	5.877	1.000	.00		
	2	.069	9.225	.00	.477	2.096
	3	.020	16.981	.06	.419	2.389
	4	.018	18.198	.42	.860	1.163
	5	.009	25.211	.02	.503	1.989
	6	.007	29.440	.49	.427	2.339
Malaysia	1	5.884	1.000	.00		
	2	.048	11.027	.00	.464	2.157
	3	.030	13.954	.02	.493	2.030
	4	.017	18.369	.28	.938	1.066
	5	.011	23.099	.36	.683	1.464
	6	.009	25.652	.34	.668	1.496

**CONCLUSIONS AND RECOMMENDATIONS**

This study is aimed at comparing the impact of perceived innovation attributes on attitude and intention of using e-learning technology among Sri

Lankan and Malaysian postgraduate students. In the data analysis it was found that both Sri Lankan and Malaysian postgraduate students perceived that, if the benefits of the e-learning can be visible (observability)

and if e-learning can gain advantages in terms of economics, social prestige, convenience and satisfaction (relative advantage) it would lead to increase the attitude and intention of using e-learning. Therefore observability and relative advantage are the precedence factors in both Sri Lanka and Malaysia in terms of accepting e-learning among postgraduate students. This finding collaborate with the results of Al-Gahatni (2003), Olatokun and Igbinedion (2009), Fu et al., (2010), Putzer and Park (2010) and Ntemana and Olatokun (2012).

On the other hand postgraduate students of Sri Lanka perceived if using e-learning is difficult (complexity) it would decrease the attitude and intention of using e-learning mode. However in Malaysia if complexity increases it would positively affect for the attitude and intention of using e-learning technology. The reason behind this finding would be Malaysian sample consists more employees in IT sector than Sri Lanka hence and the Malaysian postgraduate students perceived that e-learning is more easier to use and user friendly. This findings is compatible with Olatokun and Igbinedion (2009). In Malaysia the increase in opportunities for trying e-learning facilities before using them (trialability) is negatively affected to the attitude and intention of using e-learning by the postgraduate students by. In contrast to this, Sri Lankan postgraduate students' increment of perceived trialability leads to increase in attitude and intention of using e-learning. However in both countries trialability has no significant impact on e-learning acceptance. This finding is supported with Olatokun and Igbinedion (2009) and Ntemana and Olatokun(2012).

In both countries postgraduate students perceived that if e-learning consistent with their existing values, experiences and the needs (compatibility) it increases the attitude and intention of using e-learning. However in both Sri Lanka and Malaysia, compatibility has no significant impact with e learning acceptance. This finding is similar with the findings of Nor and Pearson (2007), Cater and Campbell (2011) and Ntemana and Olatokun(2012). In contrast to this Al-Gahatni(2003), Putzer and Park (2010) and Lin (2011) found that compatibility has a significant positive impact on the acceptance of technology.

Even though Sri Lanka and Malaysia are divergence in using advanced technology in teaching and learning activities, perceived e learning acceptance factors among postgraduate students in both counties are found to be

similar. The reason for this similarity might due to the similar social and cultural background of two countries. Also the postgraduate students in both Sri Lanka and Malaysia are experiencing a similar kind of economical and technological developments as well. Since relative advantage and observability are the prominent factors which impact for e learning acceptance in both Sri Lanka and Malaysia, to further strengthen the e-learning acceptance among postgraduate students, Sri Lankan and Malaysian educational institutes should put more effort on developing an e-learning environment which students can gain advantages in economic, social, convenient and satisfaction. Also e-learning should be more consistent to the values, experiences and needs of the potential and existing postgraduate students in Sri Lanka and Malaysia as it leads to increase the acceptance of e-learning. Further, if higher educational institutions can put more effort on making the potential students aware of the advantages and communicate them the benefits of e learning, the acceptance would be increased. On postgraduate students' perspective, both Sri Lankan and Malaysian students are required to put more effort to get used with educational technologies as e learning greatly beneficial to obtain a postgraduate qualification with all the other commitments in the life. The model that has been developed in this research can be used by the future researchers to measure the technological acceptance in different contexts and cultures to and add knowledge to the existing literature.

#### REFERENCES

- Al-Gahtani, S. S. (2003). Computer technology adoption in Saudi Arabia: Correlates of perceived innovation attributes. *Information Technology for Development* 10, 57-69.
- Asian Development Bank. (2009). *Good Practise in Information and Communication Technology for Education*.
- Cao, Y. (2010). *The Two Worlds of Adult MBA Education: Online v. Traditional Courses in Student Background and Performance*. Paper presented at the Adult Higher Education Alliance Conference The Future of Adult Higher Education: Principles, Contexts and Practices. 1-7
- Carter, L., and Campbell, R. (2011). The Impact of Trust and Relative Advantage on Internet Voting Diffusion. *Journal of Theoretical and Applied Electronic Commerce Research*, 6(3), 28-42.
- Chen, C., and Chou, s.-W. (2010). Measuring patients'

- perceptions and social influence on home telecare management system acceptance. *International Journal of Healthcare Information and Informatics*, 5(3), 44-68.
- Cunningham JB, and McCrum-Gardner E. (2007). Power, effect and sample size using GPower: practical issues for researchers and members of research ethics committees. *Evidence Based Midwifery*, 5(4), 132-136.
- Duan, Y., He, Q., Feng, W., Li, D., and Fu, Z. (2010). A study on e-learning take-up intention from an innovation adoption perspective: A case in China. *Computers & Education*, 55, 237-246.
- Engelbrecht, E. (2003). A look at e-learning models: investigating their value for developing an e-learning strategy. *Progressio* 25(2), 38-47.
- Faul Franz, Ider Edgar Erdfe, Buchner Axel, and Lang, A. r.-G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160.
- Folorunso, O., Vincent, R. O., Adekoya, A. F., and Ogunde, A. O. (2010). Diffusion of Innovation in Social Networking Sites among University Students. *International Journal of Computer Science and Security* 4(3).
- Fu, Z., Yue, J., Li, D., Zhang, X., Zhang, L., and Gao, Y. (2010). Evaluation of learner adoption intention of e-learning in China: A methodology based on perceived innovative attributes. *New Zealand Journal of Agricultural Research*, 50(5), 609-615.
- Goktalay, S. B., and Ocak, M. A. (2006). Faculty Adoption of Online Technology in Higher Education *The Turkish Online Journal of Educational Technology*, 5(4), 37-43.
- Gunawardana, K. D., and Ekanayaka, S. (2009). An Empirical Study of the Factors That Impact Medical Representatives' Attitude toward the Intention to Use M-Learning for Career Development. *Sasin Journal of Management*, 15(1), 1-26.
- Gunawardana, C. A., and Pathirana, A. (2011). Creating e-learning material with optimal utilisation of limited resources. *Sri Lanka Journal of Bio-Medical Informatics*, 2(3), 112-115.
- Hrastinski, S. (2008). Asynchronous and Synchronous e learning. *Educasue quartley* 4, 51-55.
- Koller, V., Harvey, S., and Magnotta, M. (2001). *Technology-Based Learning Strategies*, 1-44.
- Li, Y. (2004). *Faculty perceptions about attributes and barriers impacting Diffusion of web based distance education (WBDE) at the China Agricultural University Texas A&M University*, 1-286.
- Liao, H. L., and Lu, H. P. (2008). The role of experience and innovation characteristics in the adoption and continued use of e-learning websites. *Computers and Education*, 51(4), 1405-1416.
- Lin, H.-F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International Journal of Information Management*, 31(3), 252-260.
- McKenzie, J. (2001). How Teachers Learn Technology Best. *The Educational Technology Journal*, 10(6).
- Nor, K. M., and Pearson, J. M. (2007). The Influence of Trust on Internet Banking Acceptance. *Journal of Internet Banking and Commerce*, 12(2), 1-10.
- Ntemana, T. J., and Olatokun, W. (2012). Analyzing the influence of diffusion of innovation attributes on lecturers' attitudes toward information and communication technologies. *Human Technology*, 8(2), 179-197.
- Olatokun, W. M., and Igbinedion, L. J. (2009). The Adoption of Automatic Teller Machines in Nigeria: An Application of the Theory of Diffusion of Innovation. *Issues in Informing Science and Information Technology* 6, 373-393.
- PANDORA: Distance and Open Resource Access. (2009). *Distance Education Technology in Asia*.
- Perkins, R. A. (2011). Using Rogers' Theory of Perceived Attributes as a Framework for Understanding the Challenges of Adoption of Open Educational Resources. *International Journal of Humanities and Social Science* 1(18), 59-66.
- Putzer, G. J., and Park, Y. (2010). The Effects of Innovation Factors on Smartphone Adoption among Nurses in Community Hospitals. *Perspectives in Health Information Management* 7.
- Rogers, E. M. (2003). *Diffusion of Innovations* (Vol. 5th edition): Free Press, 576.
- Strategic ICT Roadmap for Malaysia. (2007). *Strategic ICT Roadmap for Malaysia*, 1-8.
- Surry, D. W. (1997). *Diffusion Theory and Instructional Technology*. Paper presented at the Annual Conference of the Association for Educational

Communications and Technology (AECT).

Usluel, Y. K., Aşkar, P., and Baş, T. (2008). A Structural Equation Model for ICT Usage in Higher Education *Educational Technology & Society*, 11(2), 262-273.

Zendehdel, M., and Paim, L. H. (2013). Predicting Consumer Attitude to Use On-line Shopping: Context of Malaysia. *Life Science Journal*, 10(2), 497-501.

Zhang, L., Wen, H., Li, D., Fu, Z., and Cui, S. (2010). E-learning adoption intention and its key influence factors based on innovation adoption theory. *Mathematical and Computer Modelling*, 51, 1428-1432.

Zolait, A. H. S. (2009). UIBR - An Approach to Innovations Acceptance. *Journal of Internet Banking and Commerce*, 14 (2), 1-17.