EMAIL USAGE AMONG YOUTH STAFF IN MALAYSIAN PUBLIC AND PRIVATE UNIVERSITIES

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ABSTRAK

Artikel ini bertujuan mengkaji faktor yang mempengaruhi penggunaan emel dalam kalangan kakitangan belia di universiti awam dan swasta di Malaysia. Model Penerimaan Teknologi (TAM) telah digunakan sebagai asas penyelidikan untuk mengkaji hubungan Tanggapan Mudah Guna (PEOU) dan Tanggapan Kebergunaan (PU) dengan penggunaan emel (U). Pengumpulan data dilakukan melalui soal selidik dan kajian diedarkan dalam kalangan kakitangan belia bukan akademik di empat buah universiti awam dan empat buah universiti swasta di Malaysia. Dapatan kajian menunjukkan pengaruh yang signifikan positif PEOU ke atas PU dalam penggunaan emel dalam kalangan kakitangan belia universiti awam dan swasta di Malaysia . Kedua-dua PEOU dan PU mempunyai pengaruh positif dengan penggunaan emel dalam kalangan mereka. Akhirnya, PU mempunyai kesan pengantaraan pada hubungan PEOU dan penggunaan emel. Kakitangan belia dengan tahap PEOU yang tinggi menyumbang kepada PU yang tinggi dan seterusnya menyebabkan penggunaan emel yang lebih tinggi dalam kalangan kakitangan belia tersebut.

Kata Kunci: *Belia, Emel, Model Penerimaan Teknologi (TAM), Tanggapan Mudah Guna (PEOU), Tanggapan Kebergunaan (PU)*

ABSTRACT

This article investigates factors that influence email usage among youth staff members in Malaysia public and private universities. The Technology Acceptance Model (TAM) was used as the basis of the research framework to look into the relationship of perceived ease of use (PEOU) and perceived usefulness (PU) on email usage (U). Data collection was done using survey questioners distributed among non-academic youth staff in four public and four private universities in Malaysia. The research findings showed a significant positive influence of PEOU towards PU on email usage among youth staff in Malaysian universities. Both PEOU and PU have significant positive influence on email usage among them. Finally, PU has a mediation effect on the relationship of PEOU and email usage. Youth staff with higher PEOU level has contributed to higher PU, subsequently resulted in higher email usage among that particular youth staff mentioned.

Keywords: *Youth, Email, Technology Acceptance Model (TAM), Perceived Ease of Use (PEOU), Perceived Usefulness (PU)*

INTRODUCTION

Electronic mail, also known as email was first introduced in 1960's for channeling communication between single computer users (Peter 2004). As internet becomes the way of life for most people in the recent years, electronic mail communication has been the most popular communication medium used in most organizations (Habil 2010). Email is "---a series of protocols to enable messages containing text, images, sound, and video clips to be transferred from one internet user to another" (Laudon & Traver 2002, p. 154). Email was initially used only for sending and reading messages alone (Peter 2004), however, email nowadays is suggested to be capable of managing action, distributing information and gratify social needs (Habil 2010). Below is quoted from a publication by Osterman Research (2010: 2):

> *"Email has changed from a tool focused primarily on communications to an information portal for the typical user. For example, most email clients or browser-based equivalents are used to: send and receive email messages, attach word processing documents, presentations and spreadsheets, create, respond to and [to] be reminded of appointments, manage tasks, manage contacts, manage real-time communications [and] take notes. [In addition], ---email is used as a portal for social networking interactions, a sort of clearinghouse for various social media feeds, not to mention the integration of real-time communications into email clients that is replacing standalone instant messaging clients".*

Eunson (2012) has listed down the benefits of using email instead of other conventional information conveyer. Email ensures the same message reaches all appropriate persons at almost the same time if needed. In addition, email is asynchronous; meaning the sender can send the message at one time and the receiver has the privilege to receive the message at another time, there need not be a proper scheduling for the prospect receivers to gather and listen to the same message at one particular time. Email also allows attachments in the form of files that contain graphics which are capable of displaying real information instead of vivid memos. The most outweighed benefit towards organizational communication is that the email healthily instigates upward and lateral communication and is effectively quicker than paper-based memos (Eunson 2012). Unfortunately, the email is not without some weaknesses. It may be perceived to be pointless and to some extent annoying if the sender has been abusing the usage or has been out focusing the message therefore risking redundancy. If again sent too frequently, emails may not be read or given attention or taken seriously. Email may be used as an excuse for some writers to avoid face to face communication be it superiors avoiding explanation or employees avoiding request disappointment. An email written in a hurry may be displaying carelessness and may seem unprofessional. In addition, an email may become difficult to be filed, stored or accessed and users risk data lost once software or hardware becomes damaged (Eunson 2012).

EMAIL USAGE WORLDWIDE

According to Radicati (2015), email usage continues to increase all over the world. In 2015, the number of worldwide email users is estimated to be nearly 2.6 billion and by the end of 2019, the increase is estimated to be over 2.9 billion. Given the estimated world population is 7.6 billion in 2019 (Cisco 2015), almost one-third of the world population will be using electronic mail by the end of 2019 (Radicati 2015).

The average number of email accounts per user ratio will grow from 1.7 accounts to 1.9 accounts per user over the next four years. Email continues to show stable growth despite the increased use of IM and social networking since it is compulsory to initiate an email account before accessing most social networking service. This requirement, a valid email address, is also applied to all online transactions services mainly shopping and banking. However, the number of email accounts all over the world is expected to increase faster than the number of email users since many users are likely to have several email accounts (Radicati 2015). Table 1 explains the statistic of worldwide email accounts and users.

Table 1: Worldwide Email Accounts and Users

	2015	2016	2017	2018	2019
Worldwide Email Accounts (M)	**4,353**	**4,626**	**4,920**	**5,243**	**5,594**
%Growth		*6%*	*6%*	*7%*	*7%*
Worldwide Email Users* (M)	**2,586**	**2,672**	**2,760**	**2,849**	**2,943**
% Growth		*3%*	*3%*	*3%*	*3%*
Average Accounts Per User	1.7	1.7	1.8	1.8	1.9

Source: Reproduced from Radicati (2015)

In 2015, the total number of emails received and sent per day is over 205 billion. The number is predicted to increase at an average yearly rate of 3% making the expected total number of email activities 246 billion by the end of 2019 (Radicati 2015). Table below explains the daily email traffic worldwide.

Table 2: Daily Email Traffic

Daily Email Traffic	2015	2016	2017	2018	2019
Total Worldwide Emails Sent/Received Per Day (B)	205.6	215.3	225.3	235.6	246.5
% Growth		*5%*	*5%*	*5%*	*5%*
Business Emails Sent/Received Per Day (B)	112.5	116.4	120.4	124.5	128.8
% Growth		*3%*	*3%*	*3%*	*3%*
Consumer Emails Sent/Received Per Day (B)	93.1	98.9	104.9	111.1	117.7
% Growth		*6%*	*6%*	*6%*	*6%*

Source: Reproduced from Radicati (2015)

EMAIL USAGE IN MALAYSIA

A study by Ipsos among 24 countries across the world showed that as high as 85% of respondents are using emails (Ipsos 2012) while in Malaysia, many studies suggest that less than 35% of the sample population are found to be using emails (Mahomed 2015). A study among 4,000 Malaysian between the ages of 15 to 64 years old, regardless of social status, showed that only 33% of the samples used email whilst Facebook was used by about 71% of the samples (see figure 1) (Nielsen 2010). The study signifies the difference in usage between email and Facebook in Malaysia.

Figure 1: Internet Activities among Malaysian Citizens Between October and December 2010 for the last 30 days

Source: Reproduced from Nielsen (2010)

In a study by Osman et al. (2011) which looked into multiple variables in smartphone usage (such as application software, email, internet browsing, ringtones and other mobile applications), concluded that despite admitting to having experience internet browsing, half of the respondents have no email account and only one-third used email frequently. The study found that among the substantial 1,814 respondents, 75% of them have experienced browsing the internet, 44.3% did not have any email account and 29.8% used email frequently. These results suggest that Malaysia is facing an issue in email usage, volume and responsiveness particularly when compared to developed countries.

A more recent study by Mahomed (2015) on the level of email usage among non-academic staff in Malaysian public and private universities found private universities received a significantly higher number of official emails usage as compared to public universities with the mean rank for private universities was 234.41 while for public universities only 173.44 at 0.05 significance level. Detail findings on email received in Malaysia for both public and private universities, suggested that 30.1 % of the respondents received 6-10 messages per day, 21.9% of the respondents received more than 20 messages per day, 17.4% received 16-20 messages per day, 15.4% received around three to five messages per day and 14.9% received 11 to 15 messages. Only 1 respondent reported receiving two messages or less (Mahomed 2015).

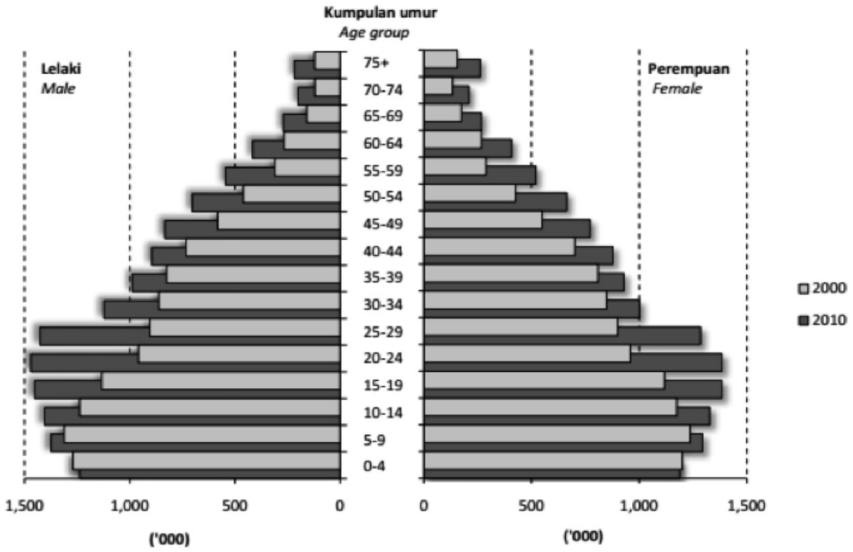
Whilst findings for email sent between Malaysian public and private universities, suggested that one-third of the respondents (33.3%) sent 3-5 messages per day. For the frequent users, 20.1% sent 6-10 messages daily, 11.7% sent 16-20 messages per day, 9% sent more than 20 messages per day, while 33 respondents (8.2 per cent) sent 11-15 messages per day. Only 0.5% or two respondents sent two messages or less per day. In addition, a mean rank of 172.26 for public universities and 235.79 for private universities clearly reflect that private universities have higher numbers of official emails sent compared to public universities p-value $\approx$ 0.00 (Mahomed 2015).

YOUTH AND INFORMATION TECHNOLOGY

Malaysian population under 15 years old has been found to be decreasing from 33.3% in 2000 to 27.6% in the year 2010. The same reduction is happening towards the working age population (15 to 64 years) from 67.3 % to 62.8% whilst the pensioners population (> 65 years) increased from 3.9% to 5.1% most likely due to increased health awareness therefore prolonging life and the change in social culture that no more encourages lots of children as previously practiced. This has led to the increased of the median age from 23.6 years in 2000 to 26.2 years in 2010, while the dependency ratio decreased from 59.2 per cent to 48.5 per cent. All these variables indicates the transition towards being an ageing population in Malaysia (Mahomed 2015 cited from Department of Statistics Malaysia 2010, p. 6). Figure 2 below suggests that the population of youth in Malaysia aged below 30 years are

more than 15 million which is more than half of the whole Malaysian population (Department of Statistics Malaysia 2010). The details of composition of population by sex and age group are depicted in the figure given below:

Figure 2: Composition of Population by Sex and Age Group in 2000 and 2010



Source: Reproduced from the Department of Statistics, Malaysia (2010, p. 6)

The definition of Youth according to United Nations Education, Scientific, and Cultural Organization 2015) as follows:

> *"Youth is best understood as a period of transition from the dependence of childhood to adulthood's independence and awareness of our interdependence as members of a community. Youth is a more fluid category than a fixed age-group. However, age is the easiest way to define this group, particularly in relation to education and employment. Therefore "youth" is often indicated as a person between the age where he/she may leave compulsory education, and the age at which he/she finds his/her first employment. This latter age limit has been increasing, as higher levels of unemployment and the cost of setting up an independent household puts many young people into a prolonged period of dependency. ---- The UN, for statistical consistency across regions, defines 'youth', as those persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States".*

In Malaysian context, Bahari (1995) defines youth based on values, spirit and idealism. The community likewise, considered youth as living the age ranged between 15 – 40 years old as suggested by Malaysian Youth Council, post National Youth Policy in 1980. However, recently the Malaysian government in the new National Youth Policy have changed the range of the age from 15-40 years old to 15-30 years old starting from 2018 in order to provide opportunities for generation aged under 30 years to be at the helm of leadership to shape the future parallel to development of national transformation (Omar 2014). And since the writers' research is more related to information technology studies, the range age of 15-30 years old was used in order to focus into this specific young group in line with the future plan by the government.

Teenagers nowadays grow with the internet making the social media and networking as their most used communication media in gaining acquaintance, information, knowledge and amusement. In a study by Jalil et al. (2010), 98 undergraduate students from the age of 18 to 23 years old were studied and found that both mass media and social media were equally consumed by the youth in terms of media influence and trustworthiness. It could be debated that social media complemented the mass media and they have somehow become a part of youth activities of daily living (Jalil et al. 2010).

Kapahi et al. (2013) has looked into the addiction of internet among Malaysian youth and found that there is a high risk of internet addiction for those aged between 18 – 25 years old. This is the same age group of which internet usage was the highest. On the other hand, Sathye (1999) found no association between age groups and internet adoption in Australia, however, willingness to adopt information technology tools are greater shown in younger age groups (Alsukkar 2005; Alhujran 2009).

Malaysian youth at the age group of 15 to 24 was ranked fourth as most active Internet users globally. These teenagers are called "Digital natives", defined as youths aged 15 to 24 with at least five years of active internet use. They consist of 13.4 per cent or more from the other 3.9 million Malaysians, accounting for nearly three quarters of the country's youths (Sipalan 2013 cited from United Nations International Telecommunication Union 2013).

The recent study done by Mahomed (2015) on the level of email usage among non-academic staff in Malaysian public and private universities shows that age has significant relationship with email usage in Malaysian universities with the younger non-academic executives (20-25 years old) being the most willing to use email as compared to other age ranges. However, this study does not directly analyses the relationship between youth with PEOU and PU on email usage. There is a need to investigate the reason behind the higher email usage among youth staff in Malaysian public and private universities as compared to older staff. By using PEOU and PU, the relationship between email usage of youth staff with PEOU and PU could be explored.

CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

Theories that examine factors which influence the implementation of new ICTs in organizations include Innovations Diffusion Theory (IDT) (Rogers 1983), Social Cognitive Theory (SCT) (Bandura 1986), Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980), Theory of Planned Behavior (TPB) (Ajzen 1985), Decomposed Theory of Planning Behavior (DTPB) (Peter & Shirley 1995), Technology Acceptance Model (TAM) (Davis 1989), Technology Acceptance Model 2 (Venkatesh & Davis 2000) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Viswanath et al. 2003).

TECHNOLOGY ACCEPTANCE MODEL(TAM)

This study adopts TAM as its conceptual framework. The reason to adopt TAM rather than other technology acceptance theories is because TAM has superior investigating ability as compared to other technology acceptance theories as suggested by Hong et al. (2006). Hong et al. (2006) studied the usefulness of three prospective models in exploring a sustained IT consumption. The three models include: Expectation-Confirmation Model in IT Domain (ECM-IT), Technology Acceptance Model (TAM), and a hybrid model integrating TAM and ECM-IT (extended ECM-IT). The study found that TAM has the best fit towards data followed by ECM-IT, and the extended ECM-IT is the most sparing generic model which is applicable to examine both primary and persistent IT adoption. The same is true with the study done by Lin (2007) to differentiate technology acceptance model and two variations of theory of planned behavior in order to determine which model is best to help assist in the prediction of buyer intentions to shop online. Among 297 Taiwanese customers of online bookstores suggest that while all three models are fairly parsimonious, the 5-variable TAM is more parsimonious than the 12-variable decomposed TPB. Moreover, as explained by Mahomed (2015), using TAM to analyze email usage have been proven to obtain high validity results in Western countries (Adams et al. 1992; Davis 1989, 1993), Eastern countries (Mutlu & Ergeneli 2012) as well as Malaysia (Baninajarian 2009).

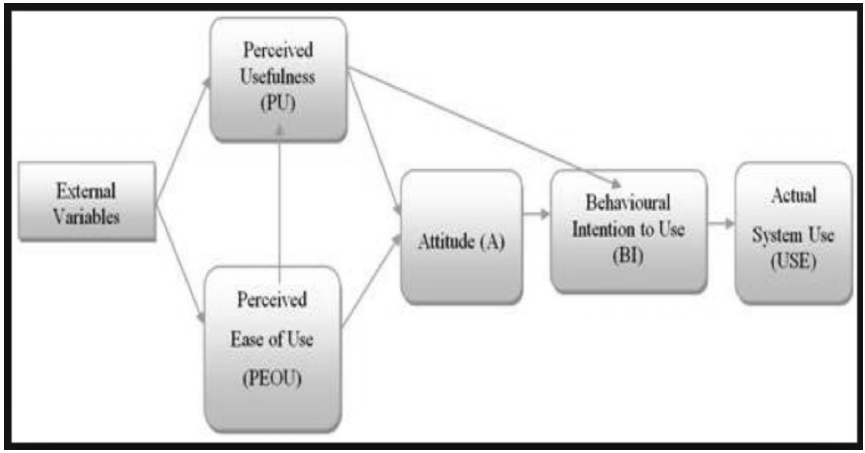
Davis (1989) established TAM to explain computer usage and ICT acceptance in organisations. Introducing TAM, Davis et al. (1989: 985) stated that:

> *"The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations"*.

Davis (1985: 24) argue that in TAM, a likely user's general attitude towards initiating a use of a system is hypothesized to be a key factor of whether or not he actually uses it. Attitude toward actual use is driven by two determinants. He identifies Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the

main determinants of technology adoption (Davis 1985) as explained in Figure 3.

Figure 3: Technology Acceptance Model (TAM)



Source: Reproduced from Davis (1989)

a) Perceived Usefulness (PU)

Perceived Usefulness (PU) is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, p. 320). In the organizational context, the usefulness may seems to either elevate the person's performance financially (e.g. sales) or non-financially (e.g. customer loyalty) in either directly or indirectly (Rauniar et al. 2014). PU is a key factor leading to consumption of system given they perceive the system as indeed a useful tool for communication within the organization (Davies 1989). Several previous studies also suggested that PU have significant positive association with system application (Davies 1989; Ramayah et al. 2005; Lin 2007; Munir 2013). The same is true with the finding by Mahomed (2015) which suggested that once an organizational member gives out a high rate of perceived usefulness to the email, they will also exhibit higher levels of actual email usage.

b) Perceived Ease of Use (PEOU)

Perceived Ease of Use (PEOU) is defined as "the degree to which a person believes that using a particular system would be free of effort and ease giving the idea of freedom from difficulty or great effort" (Davis 1989, p. 320). Davis (1989) suggested that PEOU as the other key factor determining system usage. The same finding was exhibited by the study by Mahomed (2015) which suggests that there is a significant level of PEOU on emails in Malaysian universities, since email needs to be easy to use before users even think about using it. The higher the level of PEOU, the higher the tendency of email being used in Malaysian universities (Mahomed 2015). Several other studies also

suggest that PEOU have significant positive relationship with system usage (Davies 1989; Ramayah & Aafaqi 2004; Akour et al. 2006; Mutlu & Ergeneli 2012). In addition, according to Davies (1985) PEOU has a causal effect on PU. Therefore, developing a system that is easier to use, would likely make the system more useful (Davis 1993, p. 478).

HYPOTHESES

H1: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage among youth staff in Malaysian universities.
H2: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) among youth staff in Malaysian universities.
H3: Perceived usefulness (PU) has a significant positive relationship with email usage (U) among youth staff in Malaysian universities.
H4: There is a significant mediation effect of Perceived usefulness (PU) on relationship between Perceived ease of use (PEOU) and email usage (U) among youth staff in Malaysian universities.

RESEARCH METHODOLOGY

This study collected data among youth staff from 8 Malaysian universities (4 public and 4 private Malaysian universities), using a random sampling by using a questionnaire which was self-administered. The questionnaire was divided into demographic and Technology Acceptance Instruments consisting of Perceived ease of use (PEOU), Perceived usefulness (PU) and actual usage (U). For PEOU and PU, this research applied a measurement scale developed by Davis (1989, p. 324 & 340) and Davis et al. (1989) in their original model which has been used in most TAM studies (Alhujran 2009; Davis et al. 1989; Hung et al. 2010; Ramayah & Aafaqi 2004; Mahomed 2015). Finally, for determining actual usage, the thesis used scales developed by Hart and Porter (2004, p. 50), which was also used by Hung (2011) and Mahomed (2015) matched with the item of actual usage (email received and sent) as gathered from the respondents of participating universities. The items detail explained in Table 3. This 5-point Likert scale was used for Technology Acceptance Instruments, while a number of defined response choices were used for Demographic section.

Table 3: TAM Items

No	Constructs	Code	Statement
1.	Perceived usefulness (PU)	PU1	Using email for work enables me to accomplish tasks more quickly (Davis 1989, p. 324 & 340).
		PU2	Using email for work improves my job performance (Davis 1989, p. 324 & 340).

No	Constructs	Code	Statement
		PU3	Using email for work increases my job productivity (Davis 1989, p. 324 & 340).
		PU4	Using email for work enhances my effectiveness (Davis 1989, p. 324 & 340).
		PU5	Email for work is useful in my job (Davis 1989, p. 324 & 340).
2.	Perceived ease of use (PEOU)	PEOU1	Learning how to use email is easy (Davis 1989, p. 324 & 340).
		PEOU2	My interaction with email is clear and understandable (Davis 1989, p. 324 & 340).
		PEOU3	I find email to be very flexible (Davis 1989, p. 324 & 340).
		PEOU4	I find it easy to get email to do the work I want it to do (Davis 1989, p. 324 & 340).
		PEOU5	Overall, I find that email is easy to use (Davis 1989, p. 324 & 340).
3.	Usage (U)	U1	Currently, I use email frequently at my workplace (Hart & Porter 2004, p. 50).
		U2	Currently, I use email more than any other communication channels (Hart & Porter 2004, p. 50).
		Actual Usage	The actual email usage (received and sent).

DATA ANALYSIS AND RESULTS

The population consisted of non-academic youth staff of aged between 20-30 years old from 8 universities (4 public and 4 private Malaysian universities). This population was chosen since this study was meant to look into email usage among youth staff in Malaysian public and private universities. This study was also done to explore the reason behind the higher email usage among youth staff in Malaysian public and private universities as suggested by Mahomed (2015) using PEOU and PU as the measurement. The details of the demographic profile of the 167 respondents are presented in table below:

Table 4: Respondents' Profile

	Frequency	Percentage (%)
Gender		
Male	61	36.5
Female	106	63.5

	Frequency	Percentage (%)
Race		
Malay	113	67.7
Chinese	46	27.5
Indian	5	3.0
Other	3	1.8
Religion		
Muslim	116	69.5
Buddhist	39	23.4
Hindu	5	3.0
Christian	6	3.6
Other	1	0.6
Education		
Diploma	20	12.0
Bachelor Degree	125	74.9
Master Degree	22	13.2
Type of university		
Public	76	45.5
Private	91	54.5

Among the respondents, 36.5% are males, 67.7 per cent are Malays, 27.5 per cent Chinese and 3 per cent Indian. The race distribution is proportionately similar to the national population proportion. Population sample are from 8 universities in peninsular Malaysia therefore samples do not include any from East Malaysia. Due to the standard policy of government towards education (Ministry of Higher Education of Malaysia 2007), it can be assumed that all the universities involved have similar general practice systems. Thus, findings from this study may still be relevant to universities from Borneo East Malaysia.

This paper used Confirmatory Factor Analysis (CFA), SEM and the assessment of Goodness of Fit. SEM was used since it has been proven to be useful for extensive and challenging studies (Chin & Todd 1995) and is capable of endorsing association between various concepts (Bollen 1989). Confirmatory Factor Analysis (CFA) is a confirmatory technique for testing *"---the theoretical relationships among the observed and unobserved variables"* (Schreiber et al. 2006, p. 323). According to Tomarken and Waller (2005), SEM's strength lies in its *"---ability to specify latent variable models that provide separate estimates of relations among latent constructs and their manifest indicators the measurement model"* (Tomarken and Waller 2005, p. 34).

Hair et al. (2010) suggest that several suitable indices should be evaluated before choosing a model's goodness-of-fit as below:

a) The chi-square ($\chi 2$)

b) One incremental fit index (i.e. CFI or TLI)
c) One absolute fit index (i.e. GFI, RMSEA or SRMR)
d) One goodness-of-fit index (GFI, CFI, TLI, etc)
e) One badness-of-fit (RMSEA, SRMR, RMR, etc)

This paper has shadowed Hair et al. (2006) who asserts on reporting three categories of fit indices; which are absolute, incremental and parsimonious namely 1) Chi-Square ($\chi 2$), 2) Normed chi-square the ratio of the ($\chi 2$) to its degree of freedom (df), 3) Root Mean Square Error of Approximation (RMSEA), 4) Tucker-Lewis index (TLI), 5) Comparative Fit Index (CFI) and 6) Root Mean square Residual (RMR). Chi-Square value "assesses the magnitude of discrepancy between the sample and fitted covariance's matrices" (Hu & Bentler 1999, p. 2). Carmines and McIver (1981) debated that a $\chi 2$/df ratio between 1 to 3 is suggestive of a good fit. MacCallum et al. (1996) however insists that the value for RMSEA should be less than 0.08 and value above 0.10 is suggestive of a poor fit. A permissible cut for TLI is allowed to be 0.90 or greater (Hoe 2008, p. 77) as dictates by Hooper et al. (2008) who specified a cut-off criterion of CFI $\geq$ 0.90 for a good-fit. Wu (2009) however, suggest that RMR less than 0.05 would indicates a decent model fit.

Confirmatory Factor Analysis (CFA) for Technology Acceptance Model (TAM)

Using initial proposed model for TAM among the youth (30 years old and below), 5 items for Perceived Usefulness (PU), 5 items for Perceived Ease of Use (PEOU) and 3 items in Usage (U), study proceeded with confirmatory factor analysis. It is important to note that an additional observed variable was included in Usage (U) dimension, named Actual Usage which accounted for the actual usage of email (received and sent). Figure 4 presents the CFA for TAM measurement model, together with the goodness-of-fit of the proposed three latent variables model. Based on the indices, TLI, and CFI values of 0.938 and 0.951 are both above the 0.90 cut off value suggesting adequate fit of model. In addition, RMR value (0.061) lower than 0.08 suggesting that the model fits the data. RMSEA value (0.094) however was higher than the suggested 0.08 threshold value providing evidence of inadequate fit with data. In the other hand, normed chi square value of 2.452 still within the 1 to 3 range provides some evidence of model fit. Researchers believed that further investigation of model in terms of model re-specification shall remedy the high normed chi square value as well as the RMSEA value. Perusal of standardised residual covariance matrix in Table 1 in the appendix, PU3 demonstrated high standardised residual, more than the rule of thumb of 2.5 with many pairs of items, thus it is rational to label it as potential item to be discard. Further, inspection of the MIs in Table 2 in the appendix provides consistent findings in which the high correlation was detected for error term (e3) of PU3 with other latent variable such as PU, PEOU and U. Also, based on the factor loading in Figure 4, noticed that PU3 have relatively lower loading compared to others (0.65) respectively. In addition, the study also discovered that PEOU2 had low factor loading (0.39), suggesting that it should be omitted from the model. As such, PU3 and PEOU2 were omitted from further analysis.

Accordingly, the re-specify TAM (named as TAM 2) was assessed again using CFA. Figure 5 presents the results of CFA for TAM model 2 after omission of both PU3 and PEOU2. Based on the results, it seems that the model has now shown better fit indices with both TLI and CFI values of 0.982 and 0.987 which reflects well-fitting of model pertaining to the data. In TAM 2, the RMSEA further dropped from 0.094 to 0.057, and low RMR value 0.033 from 0.061 (both values < 0.08), providing evidence of acceptable model fit. Lastly, the normed chi square value of 1.539 in within range of 1 to 3 rule of thumb. Therefore, study concludes that TAM 2 showing acceptable model fit with youth data and will be used in CFA of full model as well as the SEM in hypotheses testing.

Figure 4: CFA for technology acceptance model

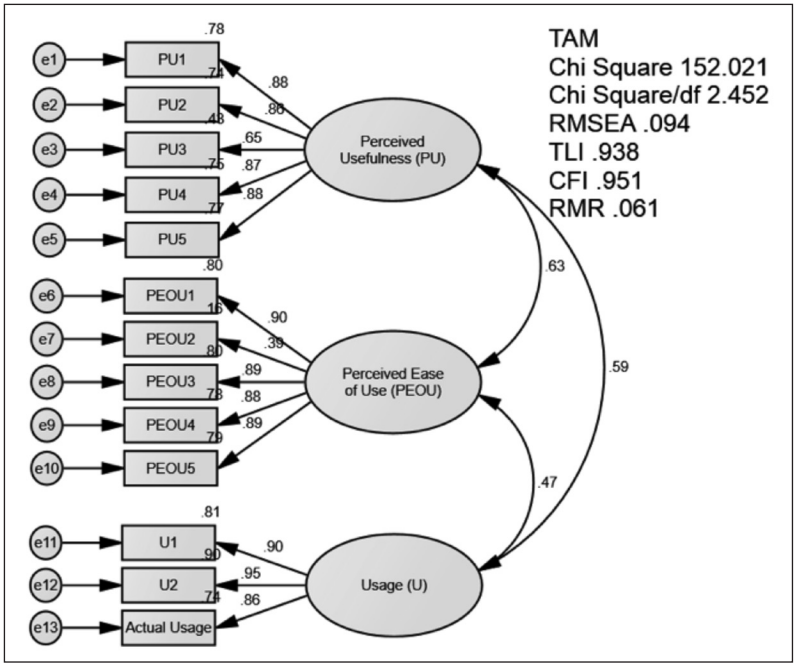
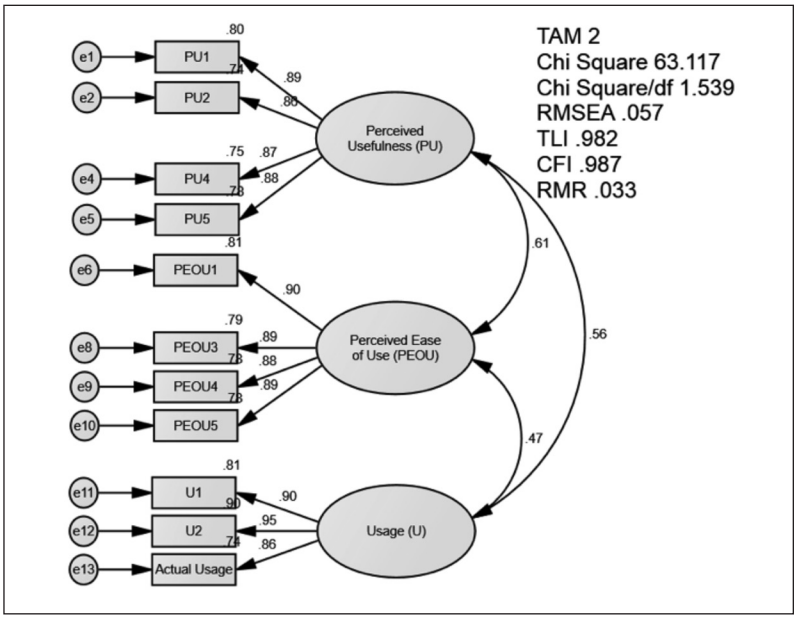


Figure 5: CFA for technology acceptance model 2



Reliability and Validity of the Measurement Model

Following the measurement model fit, this phase adapts the reliability and validity examination for measurement model as suggested by Hair et al. (2006, p. 707). Table 5 presents the factor loadings (BETA) for each items, AVE values as well as composite reliability as advised by Hair et al. (2010). Based on table, all items showed high factor loading ranged from 0.858 to 0.950. Furthermore, the AVE values are all greater than the 0.5 threshold value, ranged from 0.766 to 0.817 suggesting that the least variance in items that can be explained by constructs is 76.6%. Lastly, the reliability of each dimension which reflected by composite reliability as well ranged from 0.929 to 0.938. Therefore, given the sufficient evidence, study concludes that the measurement model has good construct reliability and adequate convergent validity.

Table 5: Convergent validity and reliability for measurement model

Path			B	Beta	P	AVE	CR
Perceived Usefulness (PU)							
PU1	<---	PU	1	0.892		0.766	0.929
PU2	<---	PU	0.882	0.858	***		
PU4	<---	PU	1.06	0.868	***		
PU5	<---	PU	0.992	0.883	***		
Perceived Ease of Use (PEOU)							
PEOU1	<---	PEOU	1	0.899		0.791	0.938
PEOU3	<---	PEOU	0.952	0.890	***		
PEOU4	<---	PEOU	0.963	0.884	***		
PEOU5	<---	PEOU	1.024	0.885	***		
Usage (U)							
U1	<---	U	1	0.900		0.817	0.931
U2	<---	U	1.165	0.950	***		
Actual Usage	<---	U	1.256	0.860	***		

Discriminate validity (squared multiple correlation matrix)

Table 6: Discriminate validity (squared multiple correlation matrix)

	U	PU	PEOU
U	0.817		
PU	0.292	0.766	
PEOU	0.228	0.382	0.791

Diagonal Bold: AVE value

Table 6 reports the squared multiple correlation matrix for discriminate validity assessment. Aforementioned, rigorous way to prove discriminate validity is by showing that the AVE value of particular construct is greater than the squared correlation between that constructs and other construct. Analysis of table, found that all AVE values are greater than the squared multiple correlation value, implying that every construct could clarify its items better than items from other construct. Therefore, study concludes that the measurement model has good discriminate validity. Based on the findings, the study has proved that the measurement model has convergent validity, construct reliability and discriminate validity; therefore the next step would be to proceed to structural equation modeling.

Normality

Kline (2005) suggest that fatal abuse of univariate normality surfaced when skewness > 3 and kurtosis > 10. In addition, Bollen (1989) suggest that Mardia's multivariate kurtosis must be greater than p (p + 2) to depicts misuse of multivariate normality (p = number of observed variables). The result of univariate normality data as stated in Table 3 in the appendix. Based on the table, Skewness and Kurtosis value for each item were between ±2, respectively. Therefore, study declares that the univariate normality for each item had been achieved. Apart from that, univariate normality alone is not sufficient to ensure a good SEM model estimation in AMOS. Consequently, Mardia's multivariate kurtosis was referred and study found that the value 15.728 is indeed much lower than the threshold value of 143 (11 x (13)). Thus, the variables deemed to exhibit multivariate normality and therefore the biasness of estimation shall occur at minimum state.

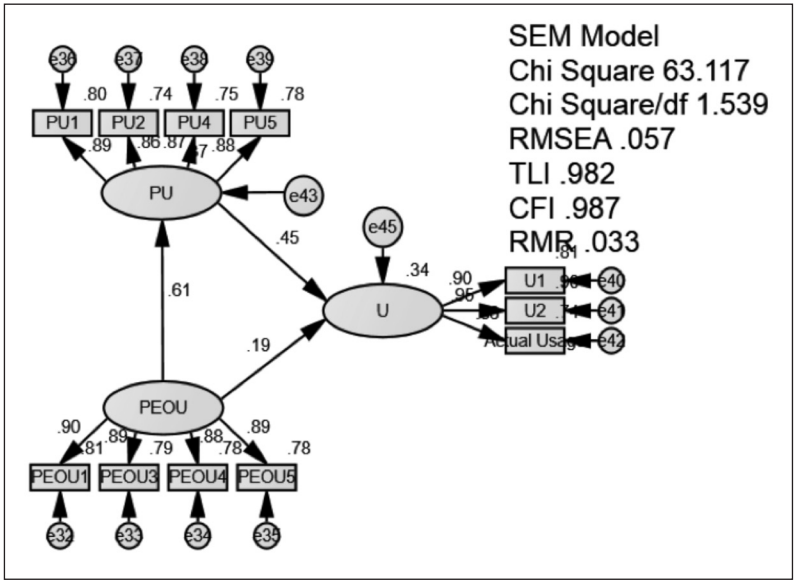
Multivariate Outliers

In this research, the Mahalanobis d-squared method was conducted by used AMOS and the result is presented in Table 4 in the appendix. From the table, approximately 5 cases having relatively small values in column p1 and p2 therefore they had been identified as outliers. These results indicated the existence of multivariate outliers in the data. There are generally two things that can be done as antidote for outliers' problem, in which the researcher can either (1) eliminate the outliers or choose to (2) retain the outliers if the data are from the target respondents (Hair et al. 2006). Eliminating outliers will most likely mend the multivariate analysis, but this action may reduce the generality of data. The retention method of the outliers had been recommended by some of researchers, unless the observations or data collected were unable to represent the study population. Accordingly, outliers in this research were somehow retained to maintain the generality of data since the data were truly taken from the target population of research.

SEM Model Fit Assessment

The SEM analysis conducted was illustrated in Figure 6 which also provides the model fit indices. Based on the results, the model has chi square value of 63.117, with normed chi square value of 1.539, indicates that the SEM has satisfactory model fit. Also, noticed that both TLI and CFI values of 0.982 and 0.987 definitely showed that the model exhibited good fit pertaining to data. Meanwhile, both RMSEA and RMR value of 0.057 and 0.033 are lower than 0.08, thus providing evidence of model good fit. Therefore, study decides to proceeds with SEM results as well as hypotheses testing with model in Figure 6.

Figure 6: Structural Equation Model



Result of SEM

Table 7 reports the p values for path estimated, and found that all three paths estimated statistically significant. Perusal of table, noticed that PEOU significantly influence PU and U at 0.05 significance level. On the other hand, PU showed significant influence on U at 0.05 significant levels.

Table 7: Regression Weights

Path			B	Beta	P	Hypothesis
PU	<---	PEOU	0.570	0.611	<0.001	Supported
U	<---	PEOU	0.205	0.194	0.032	Supported
U	<---	PU	0.501	0.446	<0.001	Supported

Mediation Effect of PU

This section purported to shed light on the mediation effect of PU on the relationship of PEOU and U. Following, bootstrapping with 2000 sample, 95% bias-corrected confidence interval and Maximum Likelihood method was employed. Table 8 below presents the standardized mediation effect of PU on the relationship which was obtained from the bootstrapping method. Based on the table, PU significantly partially mediates the relationship of PEOU and U at 0.05 significance level. PU only partially mediates the relationship since the relationship between PEOU and U remained significant with the intervention on PU.

Table 8: Mediation effect of PU

	Beta(PU)	p	Mediate
PU	0.271	0.001	Yes

Hypothesis Testing

H1: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage among youth staff in Malaysian universities.

Based on result perceived ease of use showed B value of perceived usefulness is 0.570 with p-value less than 0.001 Therefore, the researchers conclude that there is significant positive influence by perceived ease of use on perceived usefulness. This is to say, the youth staff with high perceived ease of use will more likely possess high perceived usefulness of email usage among them in Malaysian universities.

H2: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) among youth staff in Malaysian universities

Based on results, perceived ease of use has B value of 0.205 with p-value 0.032 suggesting that study obtained sufficient evidence to reject H2 null. Thus, at 0.05 significant level, perceived ease of use has significant effect on email usage. The youth staff with higher perceived ease of use will tend to have higher email usage among them in Malaysian universities.

H3: Perceived usefulness (PU) has a significant positive relationship with email usage (U) among youth staff in Malaysian universities.

Study proposed that perceived usefulness has significant influence on email usage in Malaysian universities. Based on table, perceived usefulness has B value of 0.501 and p-value less than 0.001 provide evidence to reject H3 null at 0.05 significance level, thus study concludes that perceived usefulness has significant positive influence on email usage in Malaysian universities. The higher the youth staffs possesses perceived usefulness, the higher the email usage among them in Malaysian universities.

H4: Perceived Usefulness (PU) significant mediate relationship between perceive ease of use (PEOU) with email usage (U) among youth staff in Malaysian universities in Malaysian universities.

Study proposed that perceived usefulness has significant mediation effect on relationship of perceived ease of use and email usage in Malaysian universities. Based on table, perceived usefulness has indirect value of 0.271 and p-value less than 0.001 provide evidence to reject H4 null at 0.05 significance level, thus study concludes that perceived usefulness has mediation effect on the relationship of PEOU and U. The youth staff with high PEOU will lead to high PU, and a high PU will then result in high email usage among them in Malaysian universities.

DISCUSSION AND CONCLUSION

This article examined the relationship between email usage among youth employee of the non-academic staff in Malaysian universities with TAM determinants factors namely PEOU and PU. The finding shows that there is a significant positive influence of PEOU on PU on email usage among the youth employee in Malaysian universities and that both PEOU and PU has significant positive influence on actual email usage. In addition, PU has a mediation effect on the relationship of PEOU and U. The youth staff with higher PEOU will lead to higher PU subsequently leading to higher U or actual email usage among them. These findings are regardless whether they are from the Malaysian public or private universities. These findings has supported previous finding on the significant positive effect of PEOU on system usage (Davies 1989; Ramayah & Aafaqi 2004; Akour et al. 2006; Mutlu & Ergeneli 2012; Mahomed 2015) and significant positive effect of PU on system usage (Davies 1989; Ramayah et al. 2005; Lin 2007; Munir 2013; Mahomed 2015). In addition, this study suggested that PU has a stronger impact on usage (β=0.446) than PEOU (β=0.194) as suggested by many other TAM studies (Davis 1989; Alhujran 2009; Nejati 2013; Mahomed 2015). Very few studies showed the other way round for example the study done by Hsieh and Wang (2007) which suggests that PEOU has a higher impact as compared to PU however they also admit that their finding has come to be different from most studies on technology acceptance model. This means that youth employees in Malaysian universities perceived usefulness as the most important factor of TAM that leads to email usage. Therefore it could be concluded that two constructs of TAM – the PEOU and PU – had a significant relationship with email usage among youth employee in Malaysian universities. It also suggests that TAM is a versatile model and is suitable to examine technology adoption among youth generation.

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