APPLYING THE TECHNOLOGY ACCEPTANCE MODEL IN ANALYSING THE IMPACT TOWARDS THE EMAIL USAGE AMONG ACADEMICIANS IN PAKISTAN AND MALAYSIAN PUBLIC UNIVERSITIES

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ABSTRACT. *Communication involves the intersection of two notions, specifically in an institution or organization. Thus, one of the main elements of transmitting information or increasing communication efficiency is email. Previously, email can be known as the new communication channel; however, align with the evolution, email is mostly known as part of well-developed and well-known communication through countries in the new era's transition. Therefore, this research attempted to identify the impact of the technology acceptance model on email usage among academicians in Pakistan and Malaysian public universities by applying the model of technology acceptance model derived by (Davis, 1989). This research adopts the TAM model elements: ease of use and perceived usefulness to measure the technology acceptance model's impact on email usage among academicians in Pakistan and Malaysian public universities. This study distributed 150 questionnaires between public universities in Pakistan and employed SmartPLS 2.0 for the SEM model estimation. It compared it with the previous data collected by the corresponding author of this article in his study on email usage among academicians in Malaysia. The findings show that, by using TAM's element, which is perceived ease of use and perceived usefulness, Pakistan academicians have lower PU, PEOU, and usage on overall email usage than Malaysia academicians. This study contributes to the literature and provides new insights by applying the model compared to two countries.*

Keywords: Technology Acceptance Model (TAM), perceived ease of use (PEOU), perceived usefulness (PU), email usage

1 INTRODUCTION

Communication involves the intersection of two notions, specifically in an institution or organization. Thus, one of the main elements of transmitting information or increasing communication efficiency is email. Previously, email can be known as the new communication channel. However, aligning with the evolution, email is known as part of well-developed and well-known communication through countries. According to [14] the issue of the adoption of email usage has been studied since the 1980s, and the trend has continued to evolve as the study still contained few gaps. The use of email is one of the fundamental skills needed to communicate via the Internet. Also, since the Internet was used widely, email has been one of the leading applications used by people as part of the communication channel. The use of email is one of the vital skills needed to communicate via the Internet. Thus, there is a need to study the trend of email users across the countries. Align with the increasing Internet penetration in Malaysia and Pakistan, it would be expected that email usage will also be increased, as email is one of the most successful Internet applications. Besides, email usage has been studied since the 1980s, and email usage has continued to evolve, suggesting an ongoing need to research and understand this evolution [14].

Over the last decades, there has been extensive research in applying theory in identifying the technology used. The revolution of technology has led this study to examine the impact of email usage in higher education sectors, specifically public universities, comparing two countries, Malaysia and Pakistan. Technology Acceptance Model was used to identify technology's acceptance and become the main line of technology usage scope. Therefore this research attempted to determine the impact of the technology acceptance model on email usage among academicians in Pakistan and Malaysian public universities by applying the model of technology acceptance model derived by [2].

2 Literature Review

2.1 Email Usage

[1] stated that the usage of emails increases or expends communication capabilities among employees and could replace traditional communication such as paper documents, telephone calls, and face-to-face communication. Align with the increasing internet usage and computer availability. It would be expected that email usage will also be increased, as email is one of the most successful Internet applications. This research study would identify the use of email by applying the technology acceptance model developed by [2].

Technology Acceptance Model

TAM was an essential element in measuring email usage as there are extensive research on the TAM model, which it adopted due to its robustness and simplicity. The TAM component used in this research study is perceived ease of use and perceived usefulness. [2] stated that perceived ease of use and perceived usefulness determine users' acceptance. Primarily, TAM is composed of four constructs: perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention (BI), and actual use (AU). TAM is consistently known as a model that can explain technology acceptance among individuals. The research on acceptance technology such as E-Learning proved that, empirically, TAM's element could better understand the technological context [13].

2.2 Perceived Ease of Use

Previous research in the Philippines, including public and private higher education institutions, reported that perceived ease of use significantly determines perceived usefulness. It elaborated that both TAM elements were deemed useful in assessing the use of technology [4]. According to [7] in terms of technology acceptance, such as on E-Governance,

the factor such as perceived ease of use and perceived usefulness found to be one of the prediction factors in identifying the technology acceptance among individuals. Other than that, perceived ease of use and perceived usefulness were also found to be significantly related where it was proved by the study among academicians in both Malaysian public and private universities where the Technology Acceptance Model (TAM) had a noteworthy connection with email usage among academician in both Malaysian public and private universities [11]. It implies that individuals will influence to adopt particular technology if they feel it is easy to use. A case study among elementary schools teachers on applying the TAM model in teaching materials also proved that the perceived usefulness was significantly and proportionally affected by the perceived ease of use [5]. Another survey done among Multimedia University executives in Malaysia on the roles of email in improving task performance showed that there is a significant positive relationship between perceived email ease of use and task performance among email users, which indicated that perceived email ease of use influenced task performance and that the increase in email ease of use perception generates an increase in task performance [1].
Therefore, this research study hypothesizes that perceived ease of use affects email usage and perceived usefulness among academicians in Pakistan and Malaysian public universities.
Thus it can be hypothesized that:

H1: There is a relationship between of PEOU on PU
H2: There is a relationship between of PEOU on U

2.3 Perceived Usefulness

Perceived usefulness has been widely used in the technological context in various fields, such as research done [3] among medical practitioners. This shows that the element of perceived ease of use plays a vital role in influencing the use of technology is table computers. It implies that the level of acceptance in technology is related to how useful the technology is towards the user and how likely they will continue to use it [7]. Similarly, research among metropolitan university and non-metropolitan university, it shows that for both types of universities, the increase in the perceived usefulness and the perceived ease of use towards email technology will lead to higher email usage in the university [8, 9].

Hence, this research study hypothesizes that perceived usefulness impacts email usage among academicians in Pakistan and Malaysian public universities.
Thus it can be hypothesized that:

H3: There is a relationship between PU on U

2.4 Research Model

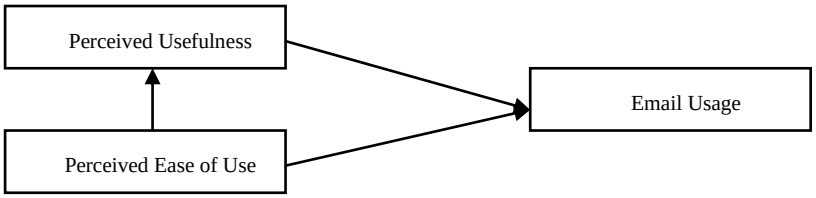

Figure 1. Research Model, Adopted from Davis (1989)

3 Methodology

This study distributed 150 questionnaires between public universities in Pakistan, resulting in 73 valid/ usable questionnaires, thus indicating a 49% response rate. Data were cleaned with SPSS version 23 and further analysis on SEM model estimation by SmartPLS 2.0.

4 Findings

The descriptive analysis of the respondents' profile is as presented in Table 1 below. It was found that the majority f academic staff in Pakistan public universities are male, encompassing about 70% of total respondents. As for the academic staff age group, results showed less academic staff in the age group of 20-25, 26-30, and over 60 years old, while other age groups have a significant portion of them, with a minimum of 10%. In terms of the academic staff's education level in public universities in Pakistan, results revealed that most of them are holding Master's degrees, approximately 67% of total respondents, followed by Ph.D. holders (29%) and lastly, degree holders, which was about 4%. Further, analyzing the distribution of positions, the study found that most academic staff in public universities in Pakistan are senior lecturers (47.9%) and associate professors (30.1%). Besides, only about 8% are professors, 11% are lecturers, and about 3% are junior lecturers.

Table 1. Respondents' Profile

Demography	Count	Percent
Gender		
Male	51	69.9
Female	22	30.1
Age		
20-25 years	2	2.7
26-30 years	3	4.1
31-35 years	9	12.3
36-40 years	9	12.3
41-45 years	10	13.7
46-50 years	12	16.4
51-55 years	12	16.4
56-60 years	10	13.7
Over 60 years	6	8.2
Education		
Degree	3	4.1
Master Degree	49	67.1

PhD	21	28.8
Position		
Professor	6	8.2
Associate Professor	22	30.1
Senior Lecturer	35	47.9
Lecturer	8	11
Junior Lecturer/ Tutor	2	2.7

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Next, to study the relationship of email technology acceptance among the academic staff in Pakistan public universities, the study employed SmartPLS 2.0 for the SEM model estimation. Three dimensions were involved in this model, i.e. email usage (U), perceived ease of use (PEOU), and perceived usefulness (PU), each with 5 indicators/ items. Besides, the sample size of 73 was deemed to be sufficient according to the rule of thumb of "10 times the largest number of structural paths directed at a particular construct in the structural model" [6] as the largest number for the model in this study was only two.

Table 2 presented the factor loading, average variance explained (AVE) value and composite reliability (CR) value for the TAM measurement model. It is important to state that items PEOU2 and PU3 were omitted due to low factor loading (<0.5 and t value < 1.96). The CR values greater than 0.7, ranging from 0.912 to 0.924 showed that each dimension (U, PEOU, and PU) has good reliability. Moreover, the AVE values were all greater than 0.5, ranging from 0.675 to 0.722, clearly showing that the measurement model has good convergent validity [12].

Table 2. Factor loadings for items of model

Factor loading			Loading	S. E.	T value	p-value	AVE	CR
AU1	<-	U	0.762	0.041	18.6	<0.001	0.675	0.912
AU2	<-	U	0.846	0.028	30.3	<0.001		
AU3	<-	U	0.850	0.029	29.3	<0.001		
U1	<-	U	0.862	0.022	39.4	<0.001		
U2	<-	U	0.784	0.034	23.1	<0.001		
PEOU1	<-	PEOU	0.867	0.028	31.3	<0.001	0.722	0.912
PEOU3	<-	PEOU	0.815	0.044	18.7	<0.001		
PEOU4	<-	PEOU	0.872	0.037	23.3	<0.001		
PEOU5	<-	PEOU	0.844	0.038	22.4	<0.001		
PU1	<-	PU	0.861	0.037	23.2	<0.001	0.753	0.924
PU2	<-	PU	0.866	0.032	27.3	<0.001		
PU4	<-	PU	0.876	0.027	32.0	<0.001		
PU5	<-	PU	0.868	0.026	33.9	<0.001		

Next, for measurement model discriminant validity assessment, study complied the matrix as in Table 3. It is a correlation matrix between the dimensions with bold diagonal value as their corresponding square root of the AVE value. The perusal of the table clearly showed that each dimension has a square root of AVE values that were greater than their corresponding correlation with other dimensions. Hence, the study concluded that the TAM measurement model showed satisfactory discriminant validity.

Table 3. Discriminant validity matrix

	PEOU	PU	U
PEOU	**0.722**		
PU	0.508	**0.753**	
U	0.572	0.665	**0.675**
Bold diagonal = square root of AVE			

Figure 1 depicted the email usage technology acceptance model that was fitted against the data collected from 73 academic staff in Pakistan public universities. From the model, the R2 value of 0.727 showed that the perceived usefulness (PU) and perceived ease of use (PEOU) were able to explain 72.7% of changes in email usage (U) among the academic staff. It was also found that PEOU was able to explain 50.8% of changes in PU, according to the R2 value.

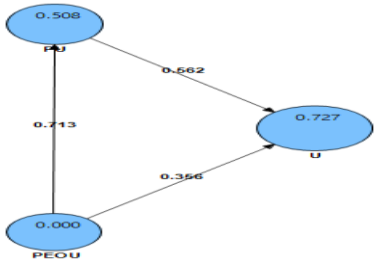

Figure 2. TAM for Pakistan public university academic staff

Table 4 showed the path estimation of the model in Figure 4.1. The relationship of the model was based on the BETA values in the direct effect column. The result showed that there is a significant positive effect of PEOU on PU at a 0.05 significance level. The positive BETA value of 0.713 showed that academic staff with higher perceived ease of use (PEOU) on email would tend to have higher perceived usefulness (PU) of email. Next, the study discovered a significant positive effect of PEOU on U at a 0.05 significance level. BETA value of 0.356 indicates that their academic staff with higher perceived ease of use (PEOU) on email will prone to have higher email usage (U). The study found that there is a significant positive direct effect of PEOU on PU at a 0.05 significance level, with a BETA value of 0.356. This tells that academic staff in Pakistan universities who perceived email service as easy to use (high PEOU), will be more likely to perceive that email service is useful (high PU) in their work. Sobel test was

conducted for the indirect effect or mediation effect of PU on the relationship of PEOU to U. Results showed that mediator, PU has a BETA value of 0.401 and significant at 0.05 significance level. Noticed that the total effect of PEOU -> U reduced from 0.756 to 0.356 for direct effect, indicating that PU only partially mediated the effect of PEOU on U at 0.05 significance level.

Table 4. **Path estimations (BETA) of model**

Path	Direct	Indirect	Total
PEOU->PU	0.713*	NIL	0.713*
PEOU->U	0.356*	0.401*	0.756*
PU->U	0.562*	NIL	0.562*

* Significant at 0.05 significance level

Next, the study compares the level of perceived ease of use (PEOU), perceived usefulness (PU), and email usage (U) between academic staff in Pakistan and Malaysia public universities. The comparison was done using 146 samples of academicians in Malaysian public universities which were collected by the corresponding author of this article in his study done in Malaysia (Mahomed et al., 2018).

Table 5. Level of TAM dimension

Dimension	Country	N	Mean	S. D.	p-value
PU	Malaysia	146	3.93	0.624	0.131
	Pakistan	73	3.76	0.876	
PEOU	Malaysia	146	3.96	0.903	0.037
	Pakistan	73	3.69	0.876	
Usage	Malaysia	146	4.07	0.701	0.018
	Pakistan	73	3.83	0.696	

An independent t-test was utilized and the results are summarised in Table 5. Based on the table, Pakistan academicians have lower perceived usefulness (PU) pertaining to email service (mean = 3.76) compared to Malaysia academicians (mean = 3.93), albeit an insignificant t-test result was obtained (p = 0.131). A perusal of the table, clearly Malaysia academicians in public universities have significantly higher PEOU (3.96 vs. 3.69) and U (4.07 vs. 3.83) compared to Pakistan academicians in public universities, supported by p values of 0.037 and 0.018, respectively.

5 CONCLUSION

This research study adopted the Technology Acceptance Model elsewhere to analyze the technology adoption, which is email usage among academicians in Pakistan and Malaysian public universities [2]. It can be summarised that applying the TAM's element, which is perceived ease of use (PEOU) and perceived usefulness (PU) has portrayed the impact to both Pakistans and Malaysian academicians. The results show that Pakistan academicians have lower PU, PEOU, and usage on overall email usage than Malaysian academicians. By treating email as an asynchronous communication medium, current email tools provide little opportunity for users to exchange cues about when to expect a response or when are good times to be reached by email [14]. Apart from that, email usage is considered necessary in the organization, specifically institutions, as stated by others [15], where email is now the preferred communications mechanism for employees. Its inherent flexibility allows individuals to send and receive large amounts of electronic information in a near-instantaneous fashion. This study contributes to the literature and provides new insights by applying the model compared to two countries. Reflecting on this study objective contributes to the practitioners' increasing academicians' performance in both countries by identifying the factors determining email usage. Although the scales showed good internal validity, future research maybe

considered to enlarge the model by adding another factor by including other sectors.

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