Investigating the Strategies to Cope with Resistance to Change in Implementing ICT : A Case Study of Allama Iqbal Open University

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Abstract

When technological change takes place, employees with positive attitude not only accept new ways of doing work but also become a motivational force to other staff members. Allama Iqbal Open University (AIOU) intends to make the best use of Information and Communication Technology (ICT) in administration, servicing and academic departments. Since it is partially launched but before implementation at mass level, this study is carried out to determine the staff attitude towards ICT. Technology Acceptance Model (TAM) is mostly used by researchers to predict the attitude and behavior towards technology and information systems in different settings. However an extended TAM model is used in this study to better predict the attitude with the help of perceived usefulness, perceived ease of use and an additional variable of subjective norm. By adopting stratified sampling the whole population was divided into three strata and 25 % of each strata was taken as sample. Quantitative results collected using questionnaire survey, indicate negative attitude in some employees but most of the respondents have positive attitude regarding ICT. This study provides empirical evidence to support theoretical model, which show that attitude is significantly associated with perceived ease of use, perceived usefulness and subjective norm, while behavior intention is found significantly related with attitude.

Introduction

In the current scenario, information and communication technologies (ICTs) have pervasive influence on the economy as well as other parts of society all over the world. ICT in educational sector is treated as application of computers and digital equipment to all phases of teaching and learning. Distance education based institutes and universities are taking full advantage of ICT, by providing education to widely separated students using computers and telecommunication means nearly each part of the world. Allama Iqbal Open University is providing education through correspondence and largely dependent on the postal and courier services. Admission processes, mailing of books and assignments submission are the main activities that are rendered through correspondence, bearing university huge amount of expenses. The management has planned to launch ICT in each phase of learning. Students will be sent soft copies of books through Internet, with schedule, assignment questions and related study material. They will be assigned user account, through which they can submit assignments and put queries with the lapse of time on academic and administrative matters. It is further planned to arrange E-meetings using groupware weekly or fortnightly to discuss problems and issues arising during course of study. Since all this process requires drastic change that technology (ICT) brings in the operations of teaching and learning. Therefore this survey is designed to determine the attitude of employees (officers/officials) about the implementation of ICT. Attitude reflects

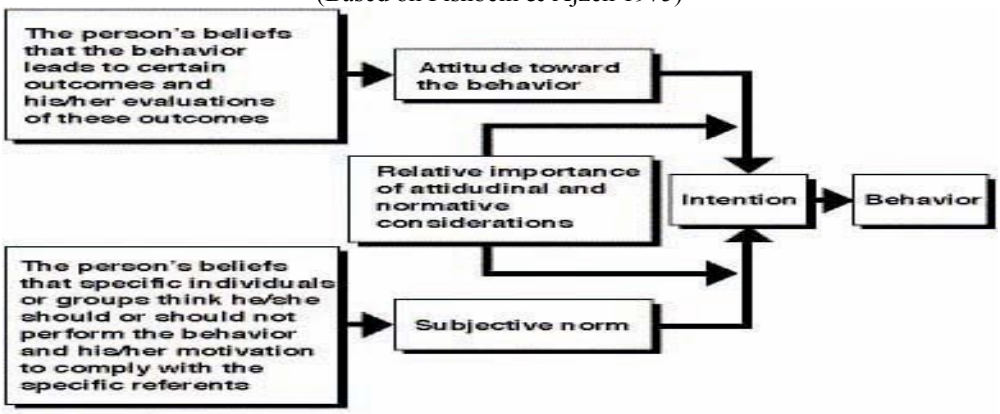
how one feels about something. It is a favorable or unfavorable evaluative reaction towards something or someone that exhibit ones beliefs, feelings, or intended behavior. The components of attitude as defined by Robbins (1999) are, cognitive, affective and cognitive. The cognitive dimension relates with our thoughts, beliefs, and ideas about something while affective or emotional refers to the feelings or emotions that something evokes. Conative or behavioral component relates with the tendency or disposition to act in certain ways toward something. Whenever innovation is implemented on education or business area, it ultimately stimulates some responses. The reactions against technological change are quite natural. Employees usually resist change until unless they get tired of existing state or have negative view about present state. Their attitude towards change varies from time to time as they start understanding the impact of change. Staff with positive attitudes are desirable, and negative attitudes undesirable during the process of implementing and using ICT (Spacey *et al.* 2004a). Because attitude directly influence the services offered to the users.

Since ICT has brought fruitful results in different pubic and private organizations operating in Pakistan. Therefore employees of AIOU may voluntarily accept better and advanced way of doing official work. This study empirically tests the attitude and diagnose whether people are willing to accept technological means for the disposal of official work or reluctant in other way.

1. Literature Review

Extensive review of the literature reveals that there is not any instrument designed to measure the attitude towards ICT implementation. Most of the researches are based on analysis of Technology Acceptance Model (TAM), which is the most influential extension of Ajzen and Fishbein's Theory of Reasoned Action Model (Figure1. TRA) in attitude measurement context. Theory of Reasoned Action premise that a person's intention is the main predictor and influencer of behavior . According to TRA, there are two main influencers of intention. They are the attitude towards the behavior and subjective norm. Attitude towards the behavior is defined as "*the individual's positive or negative feelings about performing a target behaviour*". Subjective norm is defined as "*an individual's perception that most people who are important to him think the behavior should be performed*" (Ajzen and Fishbein, 1980).

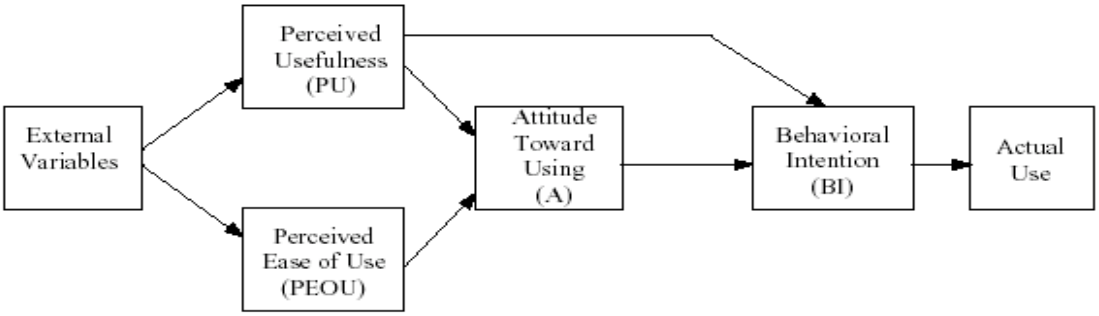
Figure 1. Theory of Reasoned Action (TRA)
(Based on Fishbein & Ajzen 1975)



Davis (1989) replaced many of TRA's attitude measures and introduced Technology Acceptance Model (Figure 2. TAM), suggesting how users accept and use technology. TAM was specifically designed to measure the technology acceptance rather attitude, because organizations

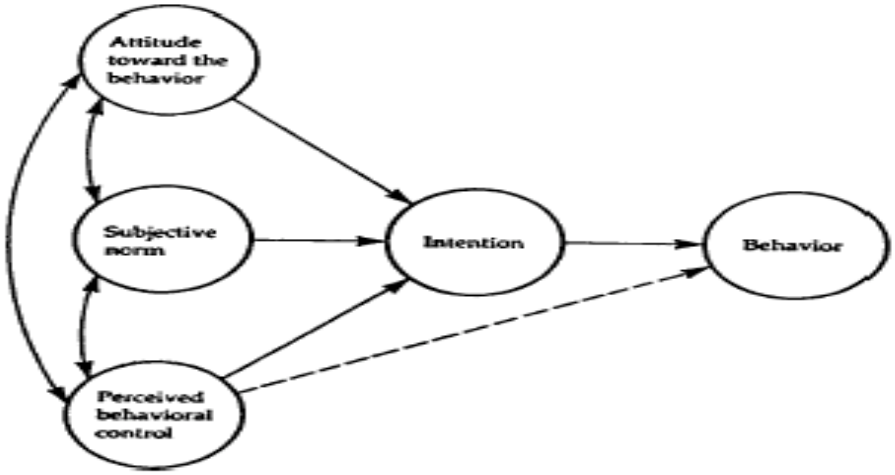
have a strong interest in understanding why people accept information technology (ICT), and a strong prediction be made about responses, while introducing technological change (Morris and Dillion, 1997).

Figure 2. Technology Acceptance Model (TAM)
(Based on Davis *et al*. 1989)



User acceptance is defined as "the demonstrable willingness among a user group to employ information technology" (Morris and Dillion, 1997). Later another modification was made in TRA by Ajzen (1991) by presenting Theory of Planned Behavior (Figure 3. TPB) to link attitude and behavior. It proposed that attitude towards the behavior, subjective norm, and perception of behavioral control are the main elements of behavioral intention. If these three are positive, then behavior intention must be positive, performing ulitmate behavior.

Figure 3. Theory of Planned Behavior (TPB),
(Based on Ajzen, 1991)



TRA was mainly focused on the variables that caused performing behavior while TAM was more influential in predicting system acceptability. TAM was found to be reliable and user friendly model in predicting the system acceptability that is the reason it is used by many researchers to know the acceptance of software packages, IT system usage and different other information systems (Davis *et al.* 1989; Dishaw *et al*. 2002; Mathieson, 1991; Straub *et al.* 1997). Morris and Dillion (1997) state that TAM is proved to be valid and reliable instrument to predict technology acceptance. The main benefit lies in its simplicity, cost-effectiveness and predictability (Morris and Dillion, 1997). TAM is a parsimonious theoretical and empirically justified model, intended to explain the acceptance of information system (IS) (Heijden, 2003). The model suggests that when users are presented with a new technology such as ICT, a number of factors influence their decision about how and when they will use it, like, perceived usefulness

& ease of use (Davis, 1989). Perceived usefulness was defined by Davis (1989) as *"the degree to which a person believes that using a particular system would enhance his or her job performance* while, Perceived ease-of-use is "*the degree to which a person believes that using a particular system would be free from effort*". Since TAM has been used in different empirical testing and yielded statistically reliable results, therefore it is considered to be a useful theoretical model in helping to understand and explain user behavior in Information system implementation (Legris, *et al* 2003). Furthermore, they are of the view, the research using TAM may benefit from examining the introduction of business process application. But in the real world there are many other constraints, such as time constraints, environmental or organizational limits and unconscious habits, which limit the freedom to act (Davis, 1989).

This is the reason, mostly researchers added other external variables to minimize the constraints and social influences to fit TAM in accordance with respective business setting, as Malhotra and Galletta (1999) added a variable of psychological attachment that contained social influence on user attitude towards technology. Ong *et al.* (2004) proposed an extended TAM model with a new construct, "perceived credibility" to examine factors affecting engineers acceptance of E-learning. Results showed that perceived usefulness had most significant effect on user's acceptance of E-learning. Perceived ease of use was found to be an important antecedent to perceived usefulness and perceived credibility. In contrast, when TAM was used to know the Internet utilization behavior of individuals, perceived ease of use found to be the strongest determinant of user attitude towards Internet use (Shih, 2004a).

But when TAM was extended to predict consumer E-shopping behavior with the help of other variables such as web security, perceived quality and user satisfaction, the study confirmed the theoretical postulation of TAM as both PU and PEOU determined consumer attitudes toward E-shopping. Secondly, attitude significantly and positively affected consumer acceptance (Shih, 2004b). In another study to predict on-line shopping when augmented TAM was implemented with additional variables of compatibility, privacy, security, normative beliefs and self-efficacy. All augmented TAM variables along with perceived ease of use and perceived usefulness were positively related with attitude except privacy, while attitude was positively related with behavior intentions (Vijayasarathy, 2004). Therefore, different researchers made different attempts to tailor TAM to best suit with their respective environment and found varying results. In some cases perceived usefulness found to be positively related with attitude and sometime perceived ease of use, but most of the time both found to be positively related with attitude. At contrast, different findings were originated from the study of Hsu and Lu (2004), who used extended TAM to know the reason why people play online games. Results reflected no positive relation of perceived usefulness with intention to play online games. However, both perceived usefulness and perceived ease of use had direct affect with attitude. He further explained that online games are for entertainment and people play games only to satisfy fancy or leisure, therefore added variables like flow experience and social norm had direct impact on the adoption of on-line games .

Heijden (2003) made different attempt and extended TAM with the help of two constructs "perceived enjoyment" and "perceived attractiveness" to determine the factors affecting the use of websites. In this study, perceived usefulness and perceived enjoyment were mainly used as independent variables while perceived ease of use and some other external variables were mediated by these two key beliefs. It was concluded that TAM proved to be quite useful to explain behavior to use websites, as perceived usefulness, perceived ease of use and perceived

enjoyment were positively related with attitude and attitude was positively related with intention to use.

Different attempts were made to implement TAM in different organizational settings. By keeping in view the reliability, flexibility and simplicity of Technology Acceptance Model (TAM), the author preferred to use a modified version of TAM (Figure 4) with an extended variable of subjective norm. Subjective norm has been used by Davis and Venkatesh (2000) in TAM2, as they were of the view that subjective norm was among the external forces (other forces were image and voluntariness) that may have affect on individual decision to adopt or reject new system. Therefore, this study mainly focuses on understanding the relationship of perceived usefulness, perceived ease of use and subjective norm with attitude in terms of technological acceptability in AIOU.

2. Research Methodology

Objectives / Aims of the research study

The main objectives of the research study were:

- Determining the attitude of staff towards implementation of ICT.
- To investigate the relationship between Independent variables (Perceived Usefulness, Perceived Ease of Use and Subjective Norm) with dependent variable (Attitude).
- To recognize the degree of association between Independent variables and dependent variables.

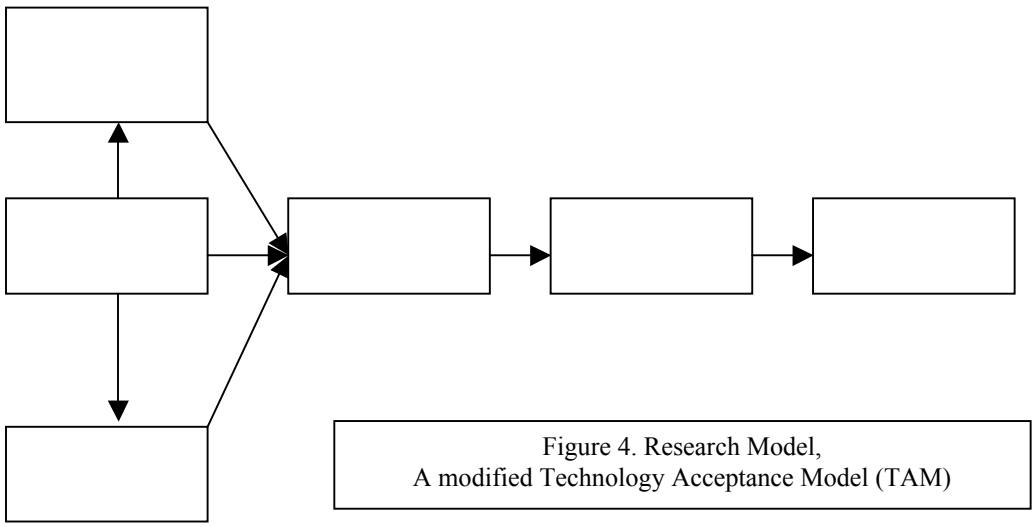


Figure 4. Research Model,
A modified Technology Acceptance Model (TAM)

Hypothesis

On the basis of Research model, following relationship was hypothesized. The basic assumption was that perceived usefulness, ease of use and subjective norm (independent variables) would have positive relationship with attitude (dependent variable) in AIOU setting, which in turn positively affects behavioral intention:

H1 : Employees have positive attitude towards Technological Change (ICT)
H2 a : Perceived usefulness is positively related to attitude
H2 b : Perceived ease of use is positively related to attitude

H2 c : Subjective norm is positively related to attitude
H3 : Attitude is positively related to behavioral Intention

Research Instrument

Primary data was collected through questionnaire. The questionnaire had two sections, one for demographical information and the other was amended TAM section. The responses for questions made use of different methods like tick-boxes, circling answers and inserting their own comments and suggestions. Demographic section was based on tick-boxes and consisting of seven questions on age, gender, qualification, department, status, rank and total experience at AIOU. The amended TAM section, which was named as attitude measurement section, had five sub-sections to determine score of independent and dependent variables. It was based on five point likert scale ranging from 1. Strongly disagree, through to 5. Strongly agree, developed by Renis Likert to enable respondents to answer questions according to the intensity of their attitude.

Sample

For sampling, a combination of two sampling types was used. At first, by adopting stratified sampling method, the whole population was divided in three strata, i.e. administration, academics and servicing. Total staff strength in AIOU Head Office is 1272 apprx, with staff strength of 212, 440 and 620 in administration, academics and servicing departments, respectively. Then using convenience-sampling approach, 20 % of each population was taken as expected respondents, which became 250 approximately in total. Sample of large respondents were taken so that they could represent the whole population.

Survey Method (Distribution and Response)

The efforts were made to collect primary data, through self-constructed questionnaire. Though it was difficult task to collect response of about 250 employees, in timely and cost effective manner. Therefore total of 450 questionnaires were distributed, through mail. The questionnaires also contained brief background information about the purpose of the study, description of ICT, instructions and measures for confidentiality. Initially response rate was low, therefore individuals were personally approached and wherever required, they were briefed about importance of research and how to fill in questionnaire in true spirit.

By taking such steps, total responses received were 262. Which became 58.22% of total. But nearly 17 questionnaires were rejected on different grounds giving 243 responses. Ultimately, responses of 54% of distributed questionnaires were analyzed using MS-Excel.

3. Research Analysis

Demographic Characteristics of Respondents

Survey respondents included 199 male (81.9%) and 44 females (18.9%) with ages ranging 18 to 60 years. Respondents between ages 18-35 were 52.2 % and 36-50 were 38.7%. Only 9.5% were between ages 51-60. Most of the respondents were having the qualification up to

postgraduate (47.8%) and graduate (29.6 %) level. 16.9 % were intermediate and 5.9% were just matriculate. It shows that most of university employees are highly educated.

AIOU mostly hire individuals on permanent basis, therefore the contribution of permanent employees were 67.5% among all respondents, while daily wages (contingent workers) and contractual workers were 28.8% and 3.7%, respectively. About the rank[1], employees within BPS (1-7) were 50.6%, BPS (11-16) were 23.5% and BPS (17 or above) were 26%. It is also concluded that most of the employees are having more than 6 years of experience with AIOU, as their responses remained 64.6%. Employees having less than 1 year experience were 8.6%, 1-2 years were 7.4% and 3-5 years were 19.3%.

As the employees were also required to indicate their respective department. The demographic data shows that out of 243 responses, 70 received from academic, 43 from administration and 130 from servicing. It presents the major portion of servicing 53.5%, academic 29.2% and 17.3% of administration.

Descriptive Analysis

Descriptive results of TAM model in relation with ICT in AIOU, revealed positive trend of each variable i.e. perceived ease of use, perceived usefulness and subjective norm toward attitude and attitude was positively related with behavior intention. Likert scale helped to explain the positive or negative feelings of employees and their future intention about ICT.

	Perceived Ease of Use	Perceived Usefulness	Subjective Norm	Behavior Intention	Attitude (ICT)
Mean	3.51	3.81	3.47	3.38	3.69
Standard Error	0.07	0.08	0.07	0.08	0.08
Median	3.83	4.17	3.75	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00
Standard Deviation	1.08	1.20	1.16	1.19	1.17
Sample Variance	1.16	1.43	1.35	1.42	1.38
Range	4.00	4.00	4.00	5.00	4.00
Sum	853.50	924.67	844.25	821.50	897.60

Table-1 *"Descriptive Analysis"*

Correlation Results:

For finding the strength of the relationship between several variables, "Pearson Product Moment Correlation Co-efficient" is used, in this tool the strength and direction of a linear relationship between two variables is indicated. Correlation is a statistical technique that shows whether and how pairs of variables are related or not. If two variables tend to increase or decrease in the same direction then the relationship is called direct or positive, however, if with the increase in one variable other decreases then the correlation is said to be negative or inverse.

[1] In AIOU, Rank is based on BPS (Basic Pay Scale)
BPS (1-7), lower rank employees
BPS (11-16), middle rank employees
BPS (17 or above), upper rank employees

	PEU	PU	SN	BI	ATT-ICT
PEU (Perceived Ease of Use)	**1.00**				
PU (Perceived Usefulness)	**0.88**	**1.00**			
SN (Subjective Norm)	**0.77**	**0.78**	**1.00**		
BI (Behavior Intention)	**0.83**	**0.85**	**0.74**	**1.00**	
ATT-ICT (Attitude Towards ICT)	**0.88**	**0.91**	**0.81**	**0.87**	**1.00**

Table-2 *"Correlation Matrix"*

Correlation of all variables is shown in Table-(III). As concluded in previous researches, significant positive correlation amongst the independent and dependent variables was found. Especially the analysis shed light on the strong positive effect of PEU on PU, as found by Saade and Kira (2006) and some others, which was calculated 0.88 in this study. It shows that if employees feel easy to use ICT, then they may take it as useful. But, if they think ICT a useful mean to work with, it doesn't mean they would feel easy to interact with. Strong positive effects (0.78) of subjective norm were found on perceived usefulness, showing that if people are forced to use ICT from higher authority (like boss) or when colleagues, friends and peers want practicing ICT, then they may consider ICT a useful way to work with. Perceived ease of use and attitude had correlation of (0.88), means that when employee feel ICT simple, effortless and flexible in doing work then their attitude become pleasant and also they enjoy while working with it. In other way, if employees feel that to be skillful at using ICT is easy then they may have favorable feelings about ICT.

Prior studies show that usefulness of technology mostly has the greatest association with attitude. A very strong correlation between these two was also calculated in the study of Spacey *et al.* (2004a). Correlation (0.91) between perceived usefulness and attitude was the highest in this study which indicates that employees have positive perception regarding ICT, as they think that it would enable them to accomplish task quickly and effectively, leading towards enhanced performance. Therefore, we can conclude that AIOU employees are of the view that ICT would increase their productivity. A correlation (0.81) between subjective norm and attitude shows that when employees have social pressure, for example from boss or people important to them, they ultimately formulate favorable feelings about technological change. It is also obvious from literature that perceived usefulness and perceived ease of use do not limit social constraints to predict attitude, it is better to take into account social influences. The behavior intention variable was added to reduce external constraint, which gives another high correlation.

In nutshell, coefficient of correlation between attitude and behavior intention was (0.87), that shows employees who regard ICT as pleasant and necessary, do intend to use practically. It concludes that, AIOU employees with positive attitude are willing to implement ICT in each phase of academic, servicing and administrative work.

Regression Results

The regression line expresses the best prediction of the dependent variable (*Y*), on the independent variables (*X*). However, there exist substantial variation of the observed points around the fitted regression line. The smaller the variability of the residual values around the regression line relative to the overall variability, the better is the prediction.

Table-IV presents the regression outcomes of equation-1, which shows that the dependence of perceived ease of use, perceived usefulness and subjective norm (independent variables) to attitude (dependent variable). Regression analysis shows the high significance of all independent variables on dependent variables, as we can see 87.25 % of the variation in attitude is explained by three independent variables, while 12.75 % is the inherent variability or remain unexplained. Correlation Coefficients, express the degree to which two or more predictors, independent variables are related to the dependent variable. We have values of coefficients *PEU, PU & SN,* 0.32, 0.50 & 0.18, respectively. The values reflect positive and significantly high relatedness of independent variables with attitude. Especially, perceived usefulness is significantly associated with attitude comparing other explanatory variables, that has also been concluded in different previous studies.

PEU, PU, SN (X) to Attitude (Y) Coefficients	
Perceived Ease of Use	0.3202
Perceived Usefulness	0.4981
Subject Norm	0.1826
Multiple R	0.9341
R Square	0.8725
Adjusted R Square	0.8709
Standard Error	0.4217

Table 3 *"Regression Analysis"*

Subjective Norm (Y) to Attitude (X) Coefficients	
Attitude	0.8592
Multiple R	0.8687
R Square	0.7546
Adjusted R Square	0.7535
Standard Error	0.5763

Table 4 *"Regression Analysis"*

Table-V shows the results of regression analysis between two variables i.e. attitude (X_4) and Behavior Intention (Y_2). From research model, behavior intention is the outcome of attitude. Therefore, an employee with positive attitude about technological change would form intentions to perform certain behavior. This is the reason, second equation yields significant impact of attitude over behavior intention. Approximately, 75.46 percent of the variation in the behavior intention is explained by attitude. The coefficient of attitude as determined by the regression is 0.86.

Tables (IV&V) confirm the interdependence of perceived ease of use, perceived usefulness and subjective norm with attitude. Whereas, attitude is found associated with behavior intentions. All it shows that, since majority of university employees think ICT easy to use and also a useful tool to accomplish task quickly. Therefore, most of them have positive attitude. Here another aspect should also be kept into account that employees think the environment in which they are working, their co-equals, friends and even bosses also want the implementation of ICT, therefore the positive trend of these explanatory variables, ultimately shaped positive attitude. The practical implication of positive attitude is behavior intention, therefore employees intend to make use of ICT in each department (Academics, Administration & Servicing).

3. Conclusion and Recommendations;

Statistical analysis shows significant impact of perceived ease of use, perceived usefulness and subjective norm on attitude. Technology acceptance model (TAM) in Allama Iqbal Open University setting, is proved to be useful theoretical model to investigate attitude and behavior intention. The result findings are consistent with the findings of Spacey *et al.* (2004a) conducted research to explore the attitude of public library staff towards ICT in UK. Where TAM was proved successful in capturing staff attitude and indication of their future behavior. A strong postive correlation was measured between perceived usefulness and attitude, while attitude remained highly associated with behavior intention. The author also concludes these findings in less developed country like Pakistan where technology means are still to be implemented with full potential.

Our study further reveals that majority of employees have positive attitude, but 24.27% employees were found with negative attitude towards ICT. Consolidated ratio shows that 22.22% employees think ICT less useful and 26.7% as difficult to use. 36.62% employees are off the view, that their negative attitude is due to external factors. Though the ratio is quite low, comparing those having positive attitude but there is still need to tailor the negative feelings into positive, so that ICT could survive in each phase of academic, service and administrative working in short period of time. Normally, employees are not well aware of the benefits associated with IT, that's the reason they fail to adopt (Riemenschneider *et al*, 2001). Sandberg and Wahlberg conclude that attitude towards ICT is mostly reactive than proactive. If employees think ICT useful than it would probably be accepted. Some other reasons are as under;

- ICT cannot be demonstrated before implementation , therefore managers with no clear understanding usually found reluctant to the acceptance.
- The determination of efficiency after ICT cannot be assessed before launch.
- ICT is not considered as strategic resource.

Recommendations:

As some employees are with negative attitude, management will have to take measure to cope with it. Prior study in information sphere shows the major contribution of usefulness for shaping the attitude. The author also concludes that perceived usefulness is the main predictor of attitude. Employees with negative attitude, if convinced about the usability of ICT, then they may develop positive feelings.

Amoako and Salam (2003) evaluated the impact of shared belief, training and communication on perceived usefulness and perceived ease of use during technology implementation in Enterprise Resource Planning (ERP). Training and communication had direct influence on the shared beliefs that users form about the benefits of the technology. Training is

an important element to positively influence the formation of beliefs that affect attitude, which in turn affects behavioral intention. In the same way open communication has positive effects on the shared beliefs which in turn raise the acceptance of technology. Therefore, AIOU should arrange training sessions, in accordance with the current technological change. Employees after acquiring requisite skills would voluntarily accept new ways of official working. Secondly, open communication would also help employees to share problems or deal with impediments in effective implementation, as Kitchen and Daly (1997) stated, "employee can only work effectively if they can participate in the organization and they can only participate it they are fully informed".

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