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***User acceptance of Turnitin application in Pakistani HEI's***

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**Abstract**

In recent past years, the emphasis over the research productivity is increased manifolds in Higher Education sector. To protect the originality of work, new plagiarism software's are continuously being introduced in the market for scholars and researchers. These applications allow the users to be productive and enhance their research skills more effectively and efficiently. When new technologies are introduced in the market, its acceptance by users becomes essential. Different factors influence the acceptance of technology. The primary objective of this study is to examine the predictors that influence faculty and students' perceptions about the use and acceptance of Turnitin. In this study, the technology acceptance model (TAM) was implied. 315 participants have taken part in the electronic survey that is used to test the hypothesized research model. The results of the analysis have revealed that the actual use of Turnitin depends on Perceived usefulness and Perceived Ease of Use of the software.

Several findings and recommendations are discussed at the end of the paper. The objective of this study is to investigate the aspects that influence the stakeholder of Higher Education Institute's (HEI) towards the acceptance and practice of Turnitin.

Keywords: Plagiarism, Plagiarism Preventions Service, Plagiarism Detection Tools

**1. Introduction**

During last twenty years information and communication technology is being applied in every span of life to make life of human beings more comfortable. The use of internet for Higher education is increasing like other allied technologies. (Gillies, 2008). The use of technology has made it possible that everyone around the world can join the global community of learners.(Bate, 1997; Ayes, 2006). Technology helps in delivering much more content in teaching and learning than the traditional ways. Its features are important when considering usefulness in context of learning outcomes. (Burns, 2002; Harun, 2002). Due to this, most of the researchers in the area verifying the potential benefits of the technology (Lee, Hsieh & Maa, 2011). In order to get maximum benefit of technology for teaching activities, faculty has to utilize all features of the technology for teaching and learning. (Butters et al, 1994). It is also important

that faculty and students accept and realize the benefits of the technology because it helps in finding satisfaction and usefulness of the same. (Campbell, 2000).

Higher Education Commission, Pakistan procured and provided Turnitin service to 60 public sector Universities in 2009 and in 2011 a 10 month trial of the service was provided to the private sector Universities. This way the total universities which are now using this service is 132 and more are expected to be the part of the service. The object of acquiring this service is to eradicate cut-paste culture and improve the writing skills by involving and engaging students in academic activities. The Turnitin2 was acquired in 2010 with objective to utilize other two components i.e. Peer Mark and Grade Mark for assuring fairness, transparency and in-depth learning. The Universities where ICT facilities are available and focus of the administration is on utilizing this source have benefitted from the service but those who are lacking these facilities are far behind. The purpose of this paper was to assess whether the service is useful, easy and efficient to fulfill the requirements and expectations of the users.

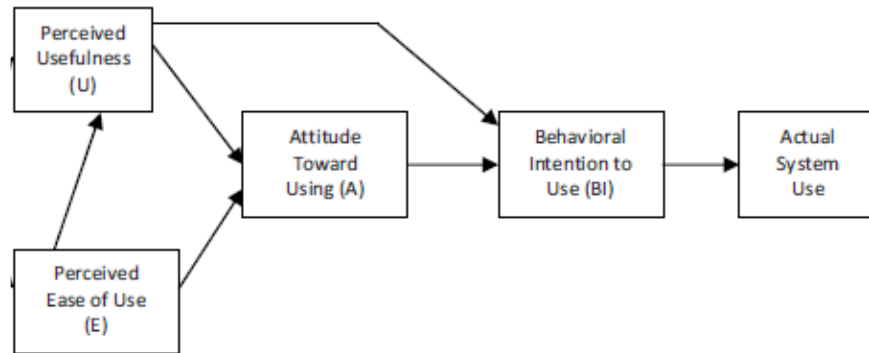
## **2. Literature Review:**

The researchers and experts are investigating the issue of use and acceptance of technology in different fields. There is wide range of content available where organizations and individuals have conducted different studies. (Sandberg & Walhberg, 2006). Here is brief about the Technology Acceptance Model (TAM). Fred Davis described the TAM on the basis of Theory of Reasoned Action (TRA). The TRA was proposed by Fishbein and Ajzen's in 1975. The TAM is investigated with few or more external parameters and their relationship is modified with further research studies. (Chuttur, 2009). It was claimed by Fishbein and Ajzen in 1975 that behavioral intention declares one's specific behavior. It has two major predictors i.e. ones attitude and subjective norms relating to the subjected behavior (Al-Gahtani & King, 1999).

The researchers in the area have used TAM in their investigations (Chuttur, 2009) it is mostly considered by technology developers (Sandberg & Walberg, 2006). The studies for validity and accuracy of such model with other parameters have also verified this fact. Sumak et al (2011) and Lee et al (2011) have conducted research on effects that encourages the users acceptance and use of e-learning technologies. Lee et al (2011) has concluded that use of technology depends on one's experience with computers and its efficiency in resolving one's problem. Whereas, it is found in the study of Sumak et al, (2011) that attitude of the user for using any application depends on the usefulness and on how much it is easy to use the application i.e. Human computer interaction. He found that for the Moodle which is open source Learning Management System (LMS). There are some experts who have found through research that proper orientation and training of the tools is helpful in motivating users to use technology/ application. (Rouibah et al, 2008; Gharbi & Naqvi, 2008). This research is focused to find acceptability of Turnitin among the users by using TAM because it is the way most of the researchers have addressed the issue of acceptability.

## 2.1 Theoretical Framework

The Technology Acceptance Model (TAM) proposes the effects on beliefs (i.e. PU and PEOU etc.) have considerable impact on peripherals like individuals, systems and organizational features followed by noteworthy influence on behavior (i.e. usage).



- 2.2 *Perceived Usefulness*: As defined by the Fred Davis it is "the degree to which a person believes that using a particular system would enhance his or her job performance". The focus will be to assess whether faculty here also feels like that i.e. they think that Turnitin use will make their job easy and will save time spent on assessment. Resultantly it will improve the performance.
- 2.3 *Perceived Ease of Use*: Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). The objective is whether the Turnitin is easy to use or not. Due to the IT readiness issue, it is necessary to address this aspect.
- 2.4 *Attitude Toward Using Turnitin*: It depend on some motivation for using the Turnitin. People here in Pakistan have concerns about originality of the documents therefore they prefer to use Turnitin for checking originality of the document. Another factor is time saved through its two components i.e. Peer Mark and GradeMark. What factors compels one to use this service will be assessed.
- 2.5 *Behavioral Intention (BI)*: This shows willingness of the person to perform or involve in the use of Turnitin in a planned manner. It reflects whether one is convinced and willing to use this service for planned teaching and learning activities?
- 2.6 *Actual Use*: This determines the use of the Turnitin by faculty members keeping in view all usefulness, ease of Use etc. The actual use is reflection of the above mentioned determinants.

### **3. Hypothesis**

H1: PU will positively influence the attitude.

H2: PU will positively influence the Behavioral intention.

H3: PEOU will have positive significant impact on PU.

H4: PEOU will have positive significant impact on ATU.

H5: ATU will indirectly influence Actual Use through positive Behavioral Intention.

H6: BI will have positive impact on actual use of Turnitin.

## 4. Research Methodology

### 4.1 Questionnaire Tool Development

The tool is developed using reliable and valid items from published research. The TAM beliefs *Perceived Ease of Use (PEOU)* and *Perceived Usefulness (PU)* are adapted from research study of Sumak et al. (2011). *Attitude towards Using (ATU)* is measured using four standard-7 point semantic differential rating scale as suggested by Yogesh & Dennis (1999) including: Wise/Foolish, Negative/Positive, Harmful/Beneficial and Good/Bad. Similarly, three items were used to measure the *Actual Use (AU)* of system including frequency of using VCon system, i.e. on hourly and weekly basis (Yogesh & Dennis, 1999). The respondents have given response on a seven-point Likert scale with 1 representing strongly disagree and 7 representing strongly agree. The demographic characteristics are shown in Table-1.

### 4.2 Data Collection

The population for this study comprised of faculty and students having varied qualifications i.e. Undergraduates, Masters and PhD's. The questionnaire is designed in GOOGLE FORMS and distributed through email survey. Amongst 1000 participants 315 have taken part in the survey representing a response rate of 31.5%.

### 4.3 Demographic Characteristics

Of the total 315 participants, 50% respondents have completed 18 years of education, and 13% have doctoral degree; more than 60% respondents have greater than 9 years' experience of using the computer. Most respondents are working in public sector organization representing 78% of the sample. The demographics are shown in Table 1:

**Table 1: Demographic Characteristics**

<b>Demographics</b>	<b>Number</b>	<b>%</b>
<b>Gender</b>		
Female	65	21%
Male	250	79%
<b>Age</b>		
<20	1	0.3%
20-29	90	28.5%
30-39	130	41.2%
40-49	62	19.6%
>50	32	10.15%
<b>Educational Level</b>		
Undergraduate-16 years education	20	6.3%
Masters-18 years education	158	50.1%
PhD-Doctoral	137	43.4%
<b>Computer Experience</b>		
<1 year	3	0.9%

1-3 years	18	5.7%
4-6 years	48	15.2%
7-9 years	52	16.5%
>9 years	194	61.5%
<b>Type of Academic Unit</b>		
Public	246	78%
Private	69	22%

#### 4.4 Measurements

Following analysis and interpretations is performed by using statistical computer software, SPSS Statistical Package 17.0. The reliability of data is tested using Cronbach alpha derived from the average correlations of all the items on the scale. The descriptive statistics of the items is analyzed by computing mean and std. deviation of each dimension of TAM. Construct Validity is verified through the correlation matrix of the dimensions, the value of the determinant, KMO and Bartlett's Test, total variance through eigenvalues, and component matrix. The convergent validity of the tool is estimated by internal consistency and composite reliability. Discriminant validity proves with the help of correlation matrix and then to predict the direction of relationships between external factors and TAM model, Regression analysis is performed.

### 5. Analysis of Data

#### 5.1 Instrument reliability

The internal consistency of instrument is measured by computing Cronbach's coefficient alpha; indicates the consistency of a multiple item scale before analyzing the hypothesis. The value of Cronbach's Alpha for the 19 items at sample size of 315 was 0.948, which indicates that the questionnaire have acceptable internal consistency reliability.

#### 5.2 Descriptive Statistics

Table-2 shows the descriptive statistics for each dimension of the tool. The Mean value 5.9 of the 4<sup>th</sup> dimension predicts that the maximum users believe that the Behavioral Intention is a function of attitude toward using the technology and it enhances performance. Similar is the case with PU, PEOU and ATU. But the Mean value 3.33 of the 5<sup>th</sup> dimension shows that less number of respondents use turn-it-in application to assess the research papers or assignments during their job. The value of the Std. Deviation of 3<sup>rd</sup> dimension is the minimum value among the Std. Deviation values of all dimensions of the instrument. This value (i.e. 1.044) shows that all respondents have very convergent views about the opinion that Attitude is measure of temperament of an individual to predict the behavioral intention (BI). Thus, positive attitude compels the user to accept the technology. The first dimension has the maximum value of the Std. Deviation i.e. 1.15. It predicts that users have less convergent views about Perceived Usefulness. Thus, Turnitin is performing less in enhancing the job productivity or efficiency.

**Table 2: Descriptive Statistics**

Factors/Constructs	Mean	Std. Deviation
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Perceived Usefulness (PU)	5.8127	1.14939
Perceived Ease of Use (PEOU)	5.6278	1.14118
Attitude towards Use (ATU)	5.7825	1.04456
Behavioral Intention (BI)	5.9913	1.05583
Actual Use (AU)	3.3048	1.22989

### 5.3 Validity Analysis

Measuring consistency denotes Reliability whereas the accuracy of the instrument is verified by validity test. An instrument is valid, if it measures what it is supposed to measure.

#### 5.3.1 Construct Validity

Different statistical methods are applied to examine the construct validity of the instrument; KMO and Bartlett's Test, the correlation matrix of the items, the value of the determinant, and component matrix. However, the reliability and validity of instrument is shown in table-3. The internal consistencies are within the acceptable range i.e. greater than .70 for all factors.

**Table 3: Construct Validity**

Constructs/Factors	Indicators	Factor loadings (>0.50)	Internal Consistency Cronbach $\alpha \geq 0.70$
Perceived Usefulness	PU1	.885	0.876
	PU2	.842	
	PU3	.832	
	PU4	.862	
Perceived Ease of Use	PEOU1	.852	0.902
	PEOU2	.850	
	PEOU3	.919	
	PEOU4	.893	
Attitude toward Using	ATU1	.944	0.963
	ATU2	.950	
	ATU3	.947	
	ATU4	.957	
Behavioral Intention	BI1	.891	0.910
	BI2	.907	
	BI3	.928	
	BI4	.829	
Actual Use	AU1	.869	0.764

	AU2	.809
	AU3	.803

### 5.3.2 Correlation Matrix

The correlation matrix of all dimensions of TAM is shown in Table-4. Correlations are used to see the inter-relation between two or more variables in order to aggregate them for further analyses. The Pearson correlation coefficient, R, is most commonly used to analyze the fitness of model to a set of data, the closer it is to unity, the better the correlation. If  $R < 0.4$ , it shows weak correlation, if  $0.4 < R < 0.6$ , it denotes a moderate correlation; however, if  $R > 0.6$  it will be strong relationship. Moreover, the double steric show the significance of the relationship between the two dimensions. These all dimensions are highly correlated with each other except Actual Use; which is moderately correlated to all the dimensions.

**Table 4: Discriminant Validity**

	PU	PEOU	ATU	BI	AU
PU	1.000				
PEOU	0.632 **	1.000			
ATU	0.802 **	0.587 **	1.000		
BI	0.801 **	0.616 **	0.792 **	1.000	
AU	0.425 **	0.407 **	0.367 **	0.444 **	1.000

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### 5.3.3 Determinants

The matrix represents correlation; therefore, Determinant varies from 0 to 1. The value of Determinant is 1.40E-008 i.e. approaches to zero. It depicts intense multi collinearity. This value indicates that the collinearity of the dimensions of the instrument is very high.

### 5.3.4 KMO and Bartlett's Test

Kaiser-Meyer-Olkin measures the Sampling Adequacy. The value 0.936 (greater than the standard value 0.5) depicts that there are sufficient items in each factor of the instrument. The Bartlett's Test of Sphericity is significant at 0.000. It shows that there is a significant difference between correlation matrix and identity matrix having zero correlation.

### 5.3.5 Component Matrix

The Table-3 shows the factor loading of nineteen items. The component matrix is computed by using the Principal Component Analysis method of extraction. The table shows that the dimensions cluster into five groups defined by high loadings. Authors suggests that it is excellent if factor loading is greater than 0.71. This means that all items have very good loadings in multi component; therefore, the instrument is a multi-dimensional instrument.

## 5.4 Regression analysis

With the help of correlation coefficient the strength of relationship found. Regression analysis is performed to check the predictors of relationship.



**Table 5: Hypothesis Analysis**

Hypothesis	Effects	$\beta$	$R^2$	$\Delta R^2$	Remarks
H1	PU -> ATU	0.802***	0.644***	0.642***	Highly Significant
H2	PU -> BI	0.801***	0.642***	0.641***	Highly Significant
H3	PEOU -> PU	0.632***	0.399***	0.397***	Highly Significant
H4	PEOU -> ATU	0.587***	0.345***	0.343***	Highly Significant
H5	ATU -> BI	0.792***	0.627***	0.626***	Highly Significant
H6	BI -> AU	0.444***	0.197***	0.195***	Highly Significant

Notes: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; NS  $p > 0.05$

The results showed that PU is found to be significant in influencing ATU and BI, supporting hypotheses H1 & H2. Similarly, PEOU is positively influencing PU and ATU. ATU was found to be significant in influencing BI, thus supporting hypothesis H5. ATU is effected by both PU and PEOU having R was found to be determined by the two variables (PU and PEOU), resulting in an  $R^2$  of 0.654. This implies that the above variables accounted for 65% of the variance in ATU. Likewise, BI was found to be significantly determined by the ATU and PU, resulting in an  $R^2$  of 0.704, which means that the above exogenous variables explained 70% of the variance in BI. AU and BI resulting in a highly significant relationship thus H6 is proved. A summary of the results are shown in Table 5.

## 6. Findings and Discussions

The study clearly examines the user acceptance of Turnitin through Technology Acceptance Model. Similar to the previous literature, PEOU and PU comes out to be most prominent component in the current survey. Regarding Perceived Usefulness, the users acknowledged the effectiveness and efficiency of the application as it makes their job so easy regarding checking of assignments, research thesis of students etc. Thus, such facility will be more beneficial for enhancing the work productivity of researcher, academicians and scholars. However, it has been examined that the interaction of users need more clarity and understandability to use the application more readily. This may requires few awareness seminars or workshops, trainings or orientation lectures for making the tool easy to use. The findings also suggest that with the help of trainings, the frequency of using the application could be augmented. It has also come across that users feel hesitant while checking the plagiarism due to strict rules and due to some other technicalities. Thus, the company should customize the software according to the user requirements. There are still rooms for improvements in the software. Thus, it can be commented that Turnitin is very helpful but difficult to learn.

This study also shows that limited access to the facility within the institutions is a strong reason of inadequate use. The access should be provided with all facilities like Peer Mark, Grade Mark and Easy Rater to overcome the manual grading approach.

It suggests that if employees/ faculty members/students are confident over their skills to use the application they would like to be skillful in using the system. It may be concluded that to perceive the ease of use of the system, users have to provide the chance for making their ATTITUDE of using the application. That is why; PU is strongly associated with ATU. The

results have shown strong relationship of user participation with BI. Thus, it can be suggested to incorporate the feedback from stakeholders to fulfill the user requirements. If user's tutorial is prepared rendering their considerations, their perseverance to accept the technology will be much higher.

It has also been found out that the actual usage of Turnitin is not very frequent. Thus it requires taking some prognostic steps to encourage the use of application in Higher education sector. Actual Use has moderate relationships with all dimensions. It indicates that the users are provided with limited opportunities to use the software. Lack of training, top management support and user involvement could be the basic cause that limited the role of application.

## **7. Conclusion**

The detailed analysis of the items of the instrument shows that, these items form a reliable and valid instrument to measure the user acceptance of the software. The value of the Cronbach's Alpha (0.948) shows that the items of the instrument have good internal consistency. The correlation of the dimensions of the instrument is also very high (e.g., 0.70+). The results of the correlation matrix, the determinant, KMO and Bartlett's Test, and component matrix show that the instrument has the construct validity. The component matrix shows that the items cluster into five group, defined by high loadings. Thus, we have a reliable and valid instrument to measure the user acceptance.

### *7.1 Research Limitations and Future study*

The study lacks external variables like organizational and management support, training etc. The future study may analyze the effects of certain external variables on user acceptance of Turnitin.

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