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Factors Influencing E-learning Among University Students

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Abstract

This study was conducted in Punjabi University, Patiala and focuses on the relationship between discipline of student and their response and attitude towards e-learning. In light of the extant literature it is recognised that discipline of students does play a role in understanding the satisfaction and experience of students in the education environment. It also analyses the effect of discipline of student on students' response towards provision of e-learning and the impact of discipline of student on weekly Internet usage. The instrument used in collecting data was the questionnaire. This study analysed 306 students enrolled in various courses across many departments in Punjabi University, Patiala. The results of ANOVA for analysing the impact of discipline of student on scale on computer and e-learning attitude showed that a non-significant relationship exists between discipline of student and attitude towards e-learning, sentiment towards computer, computer/technology fear, whereas a significant relationship exists between discipline of student and perceived usage of computers. Chi square test of association disclosed that a moderate association exists between discipline of student and weekly Internet usage. The results of this study also show that students from all discipline are in favour of provision for e-learning facilities and of online access to classroom lectures.

Keyword: Attitude, E-Learning, Department/Discipline of Student, Internet Usage, ANOVA

Introduction

The use of information communication technology (ICT) has revolutionised the process of learning where electronic devices are used for the process of effective learning. As education becomes a ubiquitous service delivered anywhere and anytime over the global network, the higher education institutions are using modern ICTs and computers to support learning, in order to provide better and more cost effective ways of delivering instruction and training.

The term e- learning covers new approaches in teaching and learning and a broad gamut of pedagogical tools to assist students in learning. E-learning is usually defined as a type of learning facilitated ICT for improving the quality of teaching and learning. A number of other terms such as, online learning, network and web-based learning, virtual learning, distributed learning are also used. E-learning is nonlinear i.e. learners determine how, what, and when they access information. It is a dynamic process – personalised, transformed and customised on demand in response to learner and environmental variables. The learner controls their own interaction with the content and presentation. It is a highly efficient and cost-effective way of learning.

The previous researchers have analysed the effect of demographic variables such as gender and age on e-learning attitude of students. It also suggests the dependence of the demographic variable department/ background of student on internet usage and activities on computer. But not much research has been done to analyse the effect of department or discipline of student as a factor affecting attitude towards computer and e-learning. This research builds an approach to examine individuals' attitude toward the computer technology and e-learning based on the discipline/ department in which they are studying thus adding a new dimension to the literature.

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Literature Review

Homan and Macpherson (2005) and Sambrook (2003) in their research used the term e-learning to cover any electronic learning material from CD-ROMs on stand-alone PCs to intranet/Internet networked systems with downloadable and interactive material. Adopting and implementing e-learning into an educational system can be categorised into three reasons; first, the growth of information technology has made e-learning an ideal delivery vehicle for education and learning. Second, it is information rich as e-learning allows access to "information rich" resources by both teachers and learners anywhere, anytime. Third, it is an alternative learning strategy it can get in touch with those who were previously denied access (e.g. students with physical disabilities) and further the blended learning approach proposes that e-learning can supplement traditional classroom off thus freeing up valuable resources and expanding the offering to greater numbers students (Jamlan, 2004). E-learning concept is existent since decades and is one of the most significant recent developments in the Information Systems (IS) industry (Wang, 2003). Overall institutional culture is not significantly associated with student outcomes but that major departments are important in the study of the impact of college on students. Faculty continues to be one of the important factors that influence the students' experiences in college, and a debate continues over the impact of the opposing roles of faculty work (Ewell, 1989). Hartnett and Centra (1977) in their research have also shown the impact that departmental culture and climate have on student learning and satisfaction. The impact of academic departments on students' satisfaction and development has been researched. The characteristics of departments such as faculty contact with students, research emphasis, and proportion of female undergraduates had a significant impact on satisfaction with education in the major and the perceived impact that college had on skill development (Umbach & Porter, 2002). Bebetsos and Antoniou (2009) in their study indicated that gender differences exist for perceived usefulness and affect, whereas no gender differences were indicated for attitude towards Physical activity. Egbo, Okoyeuzu, Ifeonacho, and Onwumeru (2011) in their research concluded that there is a tendency that female students would accept ICT use more than their male counterparts. Contrary to this Liaw and Huang (2011) in their results demonstrated that male students have more positive e-learning attitudes than female students. Bhuvaneswari and Padmanaban (2012) examined the attitude towards e-learning of secondary students of Delhi and found that demographic variables play a significant role for e-learning. Suri and Sharma (2013) conducted a study in Panjab University and found that the demographic variables such as gender, age and discipline (departments) have a considerable effect on the activities that students carry out with the help of computer.

Higher age and study year, usage of the Internet in education, more regular usage of Facebook, and more number of e-courses demonstrated a significant influence on positive attitude towards e-learning. Results of Brumini, Špalj, Mavrinac, Biočina-Lukenda, Strujić, and Brumini (2013) revealed that while students of different disciplines did not vary a great deal in their daily usage of technology, there were differences in their level of confidence in using technology. The use of technology for teaching and learning also differed across disciplines (Lam, McNaught, Lee, & Chan, 2014). Dhiman, Saha, and Mondal (2014) in their study revealed that students have high attitude towards e-learning and their attitude scores did not differ significantly with their personal variables such as, gender, stream of study and residence.

Objectives of the Study

1. To analyse the effect of discipline of student on Scale on computer and e-learning attitude (SCAELA) of students.
2. To analyse the effect of discipline of student on students response towards provision of e-learning.
3. To analyse the impact of discipline of student on weekly internet usage.

Hypothesis of Study

H_1: There is no significant difference of discipline of student on attitude for e-learning.

H_2: There is no significant difference of discipline of student on perceived usage of computer.

H_3: There is no significant difference of discipline of student on sentiments towards computer.

H_4: There is no significant difference of discipline of student on computer/ technological fear.

H_5: There is no association between discipline of student and weekly Internet usage.

Scope of Study

The study was conducted at Punjabi University, Patiala, from 1 March 2014 to 31 March 2014 for collection of data and analysis.

Research and Methodology

Participants

The study used a survey approach to examine e-learning attitudes of the students. The target population was the students studying in the Panjabi University, Patiala, India. A total of 400 questionnaires were distributed among various faculties of the university. It included Faculty of Commerce, Faculty of Fine Arts, Faculty of Engineering, Faculty of Science, and Faculty of Law.

Measurement

Demographic profile of the respondents such as name, sex, age, and faculty (Department) of student was covered in the first section. To draw a relationship between e-learning attitude and attitude towards computer technology a new scale; scale on computer & e-learning attitude (SCAELA) developed by Suri and Sharma (2013) was used, for the purpose of current study. The scale on computer & e-learning attitude contained seventeen questions that covered variables on attitude and feelings towards computer/computer technology as well as e-learning. This was constructed to measure the attitude of students towards computer technology and e-learning on Likert scale.

Overview of Data Gathered

A total of 400 questionnaires were distributed; on final scrutiny 94 were dropped because they were incomplete and the remaining 306 questionnaire were retained for the further analysis. Thus the response rate was over 77% which is a good rate. Table 1 illustrates the overview of the sample profile. Microsoft Excel and SPSS were used to analyze the questionnaire data and the subsequent data analysis were undertaken using statistical approach i.e. one-way ANOVA.

Data Analysis

Section one discusses about demographic characteristics (Table 1), i.e. gender, age, faculty of study. The sample size under study had students from all the major faculties of Panjabi University.

The distribution of males and females in the sample survey comes to be 32.4 % males and 67.6% female. All of the respondents of the survey were below the age of 26 years, out of which 34.9 % were less than 20 years and 63.2 % were between 20-26 years. The discipline under study had 34.6% representation from Commerce and 8.2% from Fine Arts followed by 16.3% and 27.8% from engineering and science. Representation from Bio tech discipline was 13.1%.

Table 1: Demographic Statistics

Descriptive Statistics	*No of Respondents*	*Percentage*
Faculty		
Commerce	106	34.6
Fine Arts	25	8.2
Engineering	50	16.3
Science	85	27.8
Bio tech	40	13.1
Gender *		
Male	99	32.4
Female	207	67.6
Age*		
Less than 20	106	34.9
20-26 years	192	63.2
26-30 years	6	2.0

*N≠306 due to unmarked fields by respondents
(Treated as Missing values in spss)

The students' response towards provision of e-learning when compared with the discipline to which the student belongs shows that students from all discipline are in favour of provision for e-learning facilities. Students

Table 2: Discipline Wise Response towards Provision for E-Learning

Questions		*Department/Discipline*				
		Commerce	***Fine Arts***	***Engineering***	***Science***	***Bio tech***
Do you think that online availability of class-room lectures will enhance your learning?	Yes	94	7	39	73	35
	No	12	18	11	12	5
Would you like to access classroom lectures online also?	Yes	92	23	40	72	36
	No	13	2	10	13	4
Do you think your department should provide e-learning facilities?	Yes	97	24	44	79	36
	No	6	1	6	5	3

agree that online availability of class room lectures will enhance their learning and they would also like to access classroom lectures online (Table 2).

The scale used for measurement of computer and e-learning attitude (SCAELA) was factor analysed. The process reduced the 17 variables into five factors after PCA with varimax rotation (Table 3). The statement which had the maximum factor loadings under a factor were grouped together. The five factors were named as Sentiments towards computer/computer technology, Attitude towards e-learning, Perceived usage of computers, Computer/ technological fear, and Physical presence of teacher (Table 3). The four factors together resulted for 58 % variance which is near 60 % of expected value. The fifth factor due to insignificant correlation with the other four was dropped.

Cronbach's alpha for checking the reliability of scale was calculated. The value was 0.789 (>0.7) which shows that

Table 3 : Rotated Component Matrix

		Component				
		1	***2***	***3***	***4***	***5***
V2.1	I feel at ease learning about computer technology	.216	.755	.031	-.055	-.108
V2.2	I am the type to do well with computer technology	.200	.755	.008	-.083	.190
V2.3	The thought of using computers is not frightening	.116	.144	.734	.087	.225
V2.4	I do not feel threatened by the impact of computer technology	.157	.217	.690	-.012	-.009
V2.5	I feel comfortable about my ability to work with computer technology	.065	.720	.338	.057	.069
V2.6	I like working with computers	.115	.622	.271	.233	-.007
V2.7	Once I get on the computer I find it hard to stop	-.088	.237	.073	.618	-.256
V2.8	I would choose to use a computer in my spare time	.100	-.194	.097	.763	.082
V2.9	I prefer to use a computer to write my assignments	.283	.172	-.311	.557	.375
V2.10	I would choose to use computers in my teachings	.521	.300	-.084	.110	.053
V2.11	e-learning is a suitable alternative to the pen/paper based system	.763	.083	.008	-.027	.186
V2.12	With e-learning my course will be more enjoyable	.805	.237	-.041	-.043	.044
V2.13	Class notes of any lectures will be easily accessible even if I miss one	.533	.072	.251	.008	.259
V2.14	With e-learning I would interact more with other students	.644	.040	.216	.020	-.287
V2.15	Studying through online medium will help me retain more	.607	.232	.194	.116	-.421
V2.16	Physical presence of teacher is extremely essential for learning the course	-.036	.104	.256	-.001	.680
V2.17	More topics can be covered in less time by use of e-learning as compared to conventional medium of blackboard and notes.	.629	.028	.137	.122	-.135
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.					
	Rotation converged in 7 iterations.					

Table 4: Factors after PCA on SCAELA

Factor	*Factors*	*No. of items*
I	Attitude towards e-learning	4
II	Perceived usage of computers	3
III	Sentiments towards computer	7
IV	Computer/Technological fear	2

the scale has good internal validity and is highly reliable. The three factors internally were reliable with Cronbach's alpha near to expected range.

To analyse the impact of discipline (department) of student on the scale on computer and e-learning attitude ANOVA was used.

Results and Discussion

The results of ANOVA revealed that factor on attitude towards e-learning at $p<0.05$ level [$F(42, 285) = 2.159$, $p = 0.074$], for factor on sentiments towards computer [$F(4,270) = .552$, $p = 0.698$], and for computer/ technological fear [$F(4, 269) = 1.606$ $p = 0.173$] is greater than .05 thus the null hypothesis was not rejected i.e. there is no significant relationship exists between discipline of student and factors of scale on computer and e-learning attitude (Table 5).

The p-value for the factor Perceived usage of computers, [$F(4, 276) = 4.765$ $p = 0.001$] is less than .05 thus the null hypothesis are rejected and this shows that a significant relationship exists between discipline of student and the factor of scale on computer and e-learning attitude.

Weekly Internet Usage

For examining the effect of discipline of student on their weekly Internet usage chi square test of association was used for attaining objective three. The Pearson chi-squared statistic came out to be 39.874. The p-value is .000 which is less than 0.05 which means the null hypothesis of no association between discipline of student and weekly Internet usage is rejected (Table 6). Phi and Cramer's V though significant have the statistic value .336 and .211 which shows a weak to moderate association (Table 7). Thus a moderate association is observed between discipline of student and weekly internet usage by student.

Table 5: ANOVA

		Sum of Squares	*Df*	*Mean Square*	*F*	*Sig.*
Attitude towards e-learning	Between Groups	3.846	4	.961	2.159	.074
	Within Groups	126.935	285	.445		
	Total	130.781	289			
Preceived usage of computers	Between Groups	9.341	4	2.335	4.765	.001
	Within Groups	135.255	276	.490		
	Total	144.595	280			
Sentiments towards computer	Between Groups	.984	4	.246	.552	.698
	Within Groups	120.378	270	.446		
	Total	121.362	274			
Computer/Technology fear	Between Groups	3.924	4	.981	1.606	.173
	Within Groups	164.362	269	.611		
	Total	168.286	273			

Table 6: Chi-Square Tests

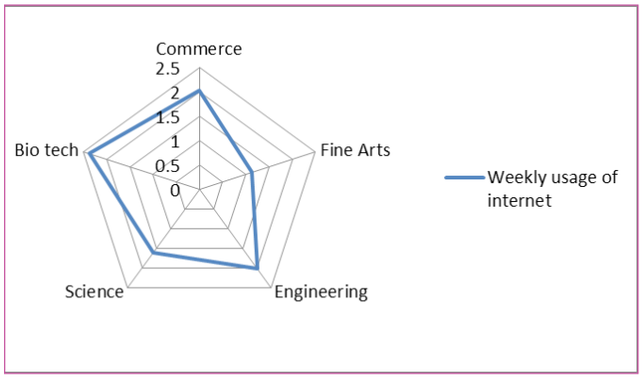
	Value	*df*	*Asymp. Sig. (2-sided)*
Pearson Chi-Square	39.874a	12	.000
Likelihood Ratio	45.990	12	.000
Linear-by-Linear Association	.055	1	.814
N of Valid Cases	298		

Table 7: Symmetric Measures

		Value	*Approx. Sig.*
Nominal by Nominal	Phi	.366	.000
	Cramer's V	.211	.000
N of Valid Cases		298	

The radar diagram further shows that weekly internet usage is maximum for the bio tech discipline in the current study (Fig. 1).

Fig. 1: Radar Graph for Discipline-Wise Weekly Usage of Internet



Conclusion

The main contributions of this study are as follow. First, the research reveals that discipline of student (department) is not a significant criterion that affects attitude towards e-learning, sentiment towards computer and computer/ technology fear which aligns with the findings reported by Dhiman et al. (2014); whereas a significant relationship exists between discipline of student and perceived usage of computers (Suri & Sharma, 2014). Chi square test of association disclosed that a moderate association exists between discipline of student and weekly internet usage. The connection/ association between discipline of student and weekly internet usage hints at the varied comfort levels that students will have from various disciplines with respect to usage of Internet/ computer technology. In the present scenario, a large scale implementation of an e-learning project can be carried out at lower cost since no significant difference exists across departments. This can help in lowering the financial burden. These results also reveal that online study enhances students' learning and that their department must provide e-learning facilities. These results can be used as inputs for proper implementation of e-learning process at any education setting. Proper analysis of the various discipline with respect to students' comfort with technology/ Internet usage should be done before implementing any technology based learning methodology.

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