Impact of Age on student's attitude towards e-learning: A study on Panjab University, India

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1. Introduction

Advances in Information and Communication Technology (ICT) are opening up new opportunities. Educational sector has radically revised the teaching and learning strategies with the aim of providing better service to the learners through the intensive use of the ICT. The evolution in the field of modern information communication technologies (ICTs) has greatly changed various aspects right from language pedagogy, language learning and language use. The information technology in teaching and learning has created a need to transform how students learn by using more modern, efficient, effective and cost-effective alternatives in the form of e-learning. An e-learning environment which works as an interface between the students and their learning objectives and provides different means to achieve the learning goal. Usually the e-Learning environment can be accessed using a Web browser over the Internet or Intranet and supports several learning strategies and different ways of interaction, communication and collaboration-learning is deployed with the objective of enhancing the students knowledge and cost saving. E-learning also helps to reach geographically dispersed groups, to provide "anywhere-anytime" learning, to provide consistency, to ensure compliance with regulations, and to improve productivity etc.

Educational institutions use e-learning for broadening the academic scope. The evolution in the field of modern information communication technologies (ICTs) has created a need to transform how students learn by using more modern, efficient, effective and cost-effective alternatives in the form of e-learning. E-learning is explained as an internet-enabled learning process (Gunasekaran et al, 2002). E-learning can provide much more references and learning scopes than the ones provided in the usual text books. Class assignments can become assigned to the students and also submitted back using e-learning portal. Decision-makers associate e-learning with the new ways of learning that are more cost efficient than traditional learning strategies and which allow students to better control the process of learning because they can decide when, where and how fast to learn. This research builds a multiple approach to examine individual attitudes toward the computer technology and e-learning. Based on age of students and the access and usage of internet by the students, this research will examine attitudes of university students toward e-learning and computer technology.

2. Review of Literature

Homan and Macpherson, (2005) and Sambrook (2003) in their research used the term e-learning to cover any electronic learning material from CDROMs on stand-alone PCs to intranet/internet networked systems with downloadable and interactive material. e-learning has undergone three distinct generations.

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The first generation from 1994-1999 marked by the passive use of the Internet where traditional materials were simply reformatted to an online format, the second generation i.e. from 2000-2003 marked by the transition to higher bandwidths, increased resources and the move to create virtual learning environment and the third generation that started from 2004 marked by the incorporation of greater collaboration, socialization, project-based learning and reflective practices (Connolly and Stansfield, 2007). Khan, (2005) pointed out that advances in information technology and new developments in learning science provide opportunities to create well-designed, learner-centered, interactive, affordable, efficient, flexible e-learning environments . No significant difference between gender and use of the computer; how long one has been using the internet and frequency of internet usage (Taoge , 2012). With respect to perceived ease of use, the study found that age and level of students had no significant relationship with perceived ease of use. With respect to perceived ease of use, the study found that age and level of students had no significant relationship with perceived ease of use Various other researches to study the effect of demographical variables such as ownership of PC, gender, age, academic qualifications, and skill and use of the computer and Internet etc on the attitude of students towards e-learning have been carried out (Katz et al. 1995; Shashaani, 1997; Francis, 1993; Roca et al. 2006; Paris, 2004 and Bertea, 2009). Online access can affect how successful students will be in Web-based classes (Anawati & Craig, 2006). Cheng, (2006) in his research found that demographical variables such as gender, computer skills are insignificant in attitude of students. E Taghavi (2006) examined undergraduate college students' attitudes toward computers. The results showed that age was not significantly related to computer attitudes. The findings also showed that subjects with access to a home computer had higher positive attitudes toward learning and working with computers. Prior technical skills or computer experiences may be influenced by age and gender and may influence intent to use a variety of technology applications (Pituch and Lee, 2006). Keller and Cernerud (2002) have identified variables such as age, gender, previous experience of computers, technology acceptance and individual learning styles as major predictive factors when discussing acceptance of technology by students. Thus the study aims to analyze the effect of age as well as internet access and usage on attitude towards computer technology acceptance and e-learning. Thus diverse views have been found in the literature. Thus the research gap here is to analyze the impact of age, internet access and internet usage on the student's attitude towards computer and e-learning.

3. Objectives and Scope of the Study
3.1 Objectives of the study:
1. To analyze the effect of age on Scale on computer and e-learning attitude (SCAELA) of students.
2. To analyze the effect of age on students response towards provision for e-learning.
3. To analyze the effect of age on students response towards provision for classroom lectures online.

3.2 Hypothesis of Study
H1: There is no significant difference on computer and e-learning attitude scale on basis of age.

3.3 Period of Study
The study was carried out from July 2012 to Oct 2012 for collection of data and analysis.

4. Research and methodology

4.1 Participants

The study employed a survey approach to examine e-learning attitudes of the students. The target population was the students studying in the Panjab University campus. A total of 500 questionnaires were distributed among various faculties of the university. It included Faculty of Arts, Faculty of Science, Faculty of Business Management, Faculty of Engineering, and Faculty of Law. The departments covered in the five faculties were over 10.

4.2 Measurement

The first section focused on the demographic profile of the respondents such as sex, age, faculty of student, access to internet and frequency of internet usage. To draw a relationship between e-learning attitude and attitude towards computer a new scale; scale on computer & e-learning attitude (SCAELA) was constructed and validated. Computer Attitude Scale (CAS) by Loyd and Gressard's (1984) & 'The Attitude towards Computer Instrument (ATCI), developed by Shaft et al. (2004) were referred and modified 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.

5. Data Analysis

5.1 Overview of data gathered

A total of 500 questionnaires were distributed on final scrutiny 23 were dropped because they were not fully filled and the remaining 477 questionnaire were retained for the further analysis. Thus the response rate was over 95% which is an exceptionally good rate. Table 1 illustrates the overview of the sample profile. The questionnaire data was analyzed using SPSS and Microsoft Excel and the subsequent data analysis were undertaken using statistical approach i.e. independent t-test, one-way ANOVA and correspondence analysis.

5.2 Data Analysis

The details regarding the demographic characteristics (Table 1), i.e. gender, age, faculty of study are discussed in section one. The sample size consisted of sample units from all the major faculties of Panjab University. The gender distribution in the sample survey was not biased with 45.1 % males and 54.7 % female respondents. The age-wise distribution depicted that the majority of the respondents were below the age of 26 years.
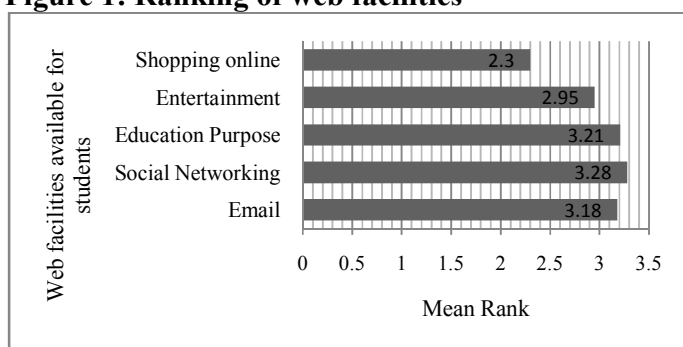
Table 1: Demographic Statistics

Descriptive Statistics	No of Respondents	Percentage
Faculty		
Arts	93	19.5
Business Management	175	36.7
Engineering Technology	72	15.1
Law	74	15.5
Science	63	13.2
Gender		
Male	215	45.1
Female	261	54.7
Age		
Less than 20	160	33.5
20-26 years	299	62.7
26-30 years	8	1.7
Above 30 years	4	0.8

*N≠477 due to due to unmarked fields by respondents (treated as missing values in spss)

The research also highlighted that among the respondents social networking is the most used web facility by the students, followed by using web for educational purpose. Email and Entertainment stand at rank three and four and online shopping is ranked the least by most of the respondents. (Figure 1)

Figure 1: Ranking of web facilities

The scale that was constructed for measurement of computer and e-learning attitude was validated and further factor analyzed. The process reduced the 17 variables into four factors after PCA with varimax rotation (Table 2). The four factors were named as Sentiments towards computer/computer technology, Attitude towards e-learning, Perceived usage of computers and Physical presence of teacher.

Table 2: Rotated Component Matrix[a]

	Component			
	1	2	3	4
V2.1	**.715**	.218	.062	.124
V2.2	**.790**	.138	.159	-.069
V2.3	**.777**	.124	.025	.049
V2.4	**.759**	.089	.017	-.112
V2.5	**.716**	.112	.244	-.036
V2.6	**.629**	.244	.341	.091
V2.7	.141	.151	**.562**	.266
V2.8	.083	.064	**.773**	.220
V2.9	.167	.175	**.699**	-.238
V2.10	.254	.427	**.462**	-.186
V2.11	.161	**.616**	.327	-.353
V2.12	.269	**.695**	.227	-.143
V2.13	.108	**.591**	-.052	.330
V2.14	.135	**.759**	.094	.117
V2.15	.172	**.757**	.161	-.071
V2.16	.002	.010	.145	**.809**
V2.17	.079	**.683**	.087	.034

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The four factors together resulted for 58 % variance which is near 60 % expected value. The fourth factor due to insignificant correlation with the other three was dropped. The scale showed good internal validity with Cronbach's alpha value as 0.857(>0.7) thus highly reliable. The three factors were highly reliable with Cronbach's alpha near to expected range. (Table 3)

Table 3: Cronbach's alpha

Factor	Cronbach's Alpha	No of items
Scale on computer & e-learning attitude	.857	17
Sentiments towards computer/computer technology	.854	6
Attitude and feelings towards e-learning	. 803	6
Perceived usage of computers	.619	4

To analyze the impact of age on the Scale on computer and e-learning attitude ANOVA was used. Correlation was run to see the relationship between age of students and their response towards provision for e-learning and provision for availability of classroom lectures online.

6. Discussion

The hypothesis of the study was tested by employing suitable statistical method. An ANOVA was run. The test of homogeneity for three factors on scale on computer and e-learning attitude with p-values greater than .05 ($p = 0.267, 0.562, 0.833 > 0.05$) depicted equal group variances. (Table 4)

Table 4: Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Attitude towards e-learning	1.321	3	465	.267
Sentiments towards computer/computer technology	.685	3	465	.562
Perceived usage of computers	.290	3	464	.833

The results of ANOVA revealed that factor on attitude towards e-learning at p<0.05 level [F (3, 465) = 1.807, p = 0.145], for factor on sentiments towards computer/computer technology [F (3, 465) = .360, p = 0.782] and perceived usage of computers [F (3, 464) = .656 p = 0.759] is greater than .05 thus the null hypothesis were accepted (Table 5). There is no significant age difference on three factors of scale on computer and e-learning attitude. Thus the age is not a significant criterion that impacts the computer and e-learning attitude.

Table 5: ANOVA (Age and factors on SCAELA)

		Sum of Squares	df	Mean Square	F	Sig.
Attitude towards e-learning	Between Groups	3.029	3	1.010	1.807	.145
	Within Groups	259.834	465	.559		
	Total	262.863	468			
Sentiments towards computer/ computer technology	Between Groups	.656	3	.219	.360	.782
	Within Groups	282.483	465	.607		
	Total	283.139	468			
Perceived usage of computers	Between Groups	1.179	3	.393	.656	.579
	Within Groups	277.978	464	.599		
	Total	279.158	467			

To further have a visual representation correspondence analysis was used for comparing the two dimensions.

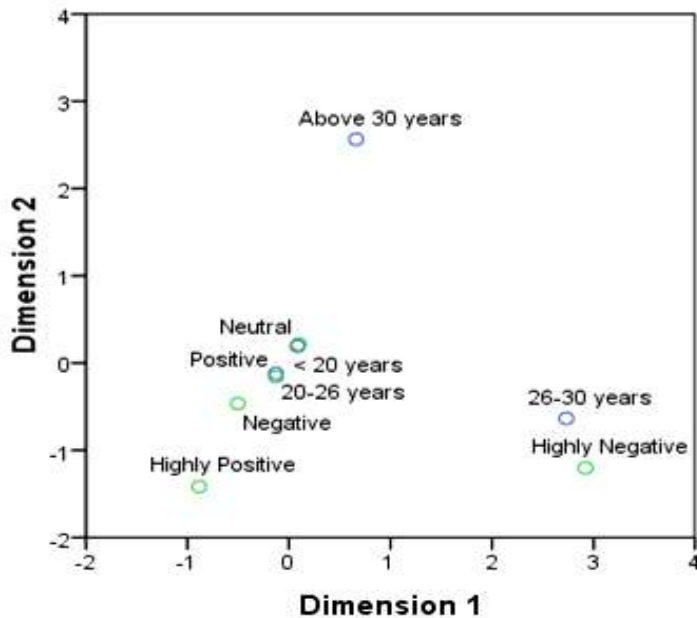**Figure 2: Correspondence analysis visual map**

Figure 2 represents a visual map between Age of the respondent and the overall feeling regarding the attitude towards computer and e-learning. Since Cronbach's alpha is very high a mean score was taken for all variables. The results show that most of the respondents in the age group of less than 20 years or 20-26 years were having more positive or neutral attitude towards computer and

e-learning attitude. The age group 26-30 years was having negative attitude towards computer and e-learning attitude as per the visual representation.

The results for correlation analysis (Table 6) also suggests that there is no significant correlation between age of students and provision for access to classroom lectures online (.004) and provision towards of e-learning (-.001).

Table 6: Correlations

	Age	Provision for availability of classroom lectures online	Provision of e-learning by department
Age Pearson Correlation	1	.004	-.001
Sig. (2-tailed)		.936	.977
N	471	468	468

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

7. Conclusion

The main contributions of this study are first, it successfully uses a newly constructed scale for measuring computer and e-learning attitude. This research also reveals that age is not a significant criterion that affects computer attitude and e-learning attitude. Third, the results revealed that no significant correlation exists between age of students and their response towards provision for access to classroom lectures online and provision of e-learning facilities by department. These results can further be used as inputs for proper implementation of e-learning process at any education setting.

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