

## **DEVELOPMENT AN INSTRUMENT TO MEASURE UNIVERSITY STUDENTS' ATTITUDE TOWARDS E-LEARNING**

**Assoc. Prof. Dr. Vandana MEHRA**  
**Panjab University, Chandigarh, INDIA**

**Dr. Faranak OMIDIAN**  
**Islamic Azad University, Dezfool, IRAN**

### **ABSTRACT**

The study of student's attitude towards e-learning can in many ways help managers better prepare in light of e-learning for the future. This article describes the process of the development of an instrument to measure university students' attitude towards e-learning. The scale was administered to 200 University students from two countries (India and Iran) .The 83-item attitude towards e-learning scale was developed on six domains as Perceived usefulness ; Intention to adopt e-learning ; Ease of e-learning use; Technical and pedagogical support ; E-learning stressors ; Pressure to use e-learning .

### **INTRODUCTION**

It is widely accepted 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 (Khan, 2005). E-learning, as a positive reaction by universities to the challenge introduced by IT, is characterized by:

- Separation in time or space between the teacher and students, among the students themselves, and between the students and educational resources;
- 2) interaction between the teacher and students, among the students, and between the students and educational resources by means of one or more media, especially through the internet; and
- a process of teaching and learning not limited to the immediate time and or place (Oh, 2003).

However, despite the growing technology in higher education several recent studies (Hayashi, Chen, Ryan &Wu, 2004 ; Laurillard, 1993; Leem & Lim, 2007; Link & Marz, 2006) have advocated that universities have been slow to bring e-learning into the main stream and maximize the potential benefits in the classroom. They discovered that failing to acknowledge the importance of understanding e-learning was an important issue. Many students may lack the necessary skills to use e-learning effectively and are therefore handicapped. Yet colleges and universities continue to invest large sums of money in automation and electronic communication facilities. For this reason, Martinze (2004) suggests that the study of student's attitude towards e-learning can in many ways help managers better prepare in light of e-learning for the future. Usun, (2003) , Asan and Koca (2006) reveal that there is a relationship between students attitude towards e-learning and positive learning outcomes.

Perez Cereijo (2006) proposes that students attitude towards e-learning provides a beneficial construct to predict learning outcomes. Ellis, Ginns and Piggott (2009) also discovered significant strong positive correlations between the deep approaches, the e-learning variables, perceptions of the quality of e-learning and achievement.

There are number of studies (Ray, Sormunen & Harris ,1999 ; Valenta , 2001 ; Zaraii Zavaraki, 2003; Burgess, 2003; Paris, 2004; Hashim & Mustapha, 2004; Childs, Blenkinsopp, Hall & Walton, 2005; Jones & Jones, 2005; Sam, Othman & Nordin, 2005; Khunyakari, Mehrotra, Natarajan & Chunawala, 2006; Upton, 2006; Smart & Cappel, 2006 ; Gay, Mahon, Devonish, Alleyne & Alleyne, 2006; Cooner & Hickman, 2008; Svirko & Mellanb, 2008; Buzzetto-More, 2008; Yaghoubi, Mohammadi, Iravani, Attaran & Gheidi, 2008; Neo, Neo & Yap, 2008; Ostlund, 2008; Al-Doub, Goodwin & Al-Hunaiyyan, 2008 ; Rezaei, Movahed Mohammadi, Asadi & Kalantray , 2008; Palmer & Holt, 2009; Theyßen & Hahn-Allee , 2009; Keller & Cernerud , 2002; Ibrahim, Silong & Samah, 2002; Guruajan & low, 2004; Haywood, Macleod, Haywood, Money & Alexander, 2004; Kwun, Alshare & Grandon, 2005; Becta, 2008) which have identified significant merits and demerits of e-learning in view of university students. Yet there is no standardized instrument to measure postgraduate students' attitude towards e-learning.

Attitude is defined as an individual's positive or negative feelings (evaluative effect) about performing the target behavior (Ajzen & Fishbein , 1980 ; Breckler & Wiggins,1992; Davis, 1989; Hao, 2004 ; Fishbein & Ajzen, 1975 ; Harris ,1999 ; Marie-Louise , et al ., 2009; Masrom, 2007; Van Raaij & Schepers, 2008; Venkatech, 2000; Zanna & Rempel, 1988).

This means that learners' positive or negative feelings of participating in e-learning activities through computer use will directly influence their behavior to use online learning to study.

Different students have different insights on online learning. Understanding students' attitudes towards e-learning can help to determine the extent to which students utilize the e-learning system (Ong & Lai, 2006).

In this paper, the scale of attitude towards e-learning was developed to assess the students' attitude towards e-learning.

## **METHOD**

The series of steps followed in the development of the scale to assess students' attitude towards e-learning were as follows;

### **Step: 1 Developing preliminary draft of the scale**

Items for the preliminary draft of the scale were developed after consultation with available literature on e-learning and experts in educational technology. Ninety two items were developed on a five point scale.

For positive items, score of 5 was given for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree. On the contrary for negative items, score of 1 was given for strongly agree, 2 for agree, 3 for undecided 4 for disagree and 5 for strongly disagree.

The summated score of the items provided the total score. The items were developed in the following domains as shown in the table below:

**Table: 1**  
**Different domains of the scale of Attitude towards e-learning**

Domain	Item No
Perceived usefulness	From 1 till 32
Intention to adopt e-learning	From 33 till 53
Ease of e-learning use	From 54 till 68
Technical and pedagogical support	From 69 till 78
E-learning stressors	From 79 till 88
Pressure to use e-learning	From 89 till 92
<b>Total</b>	<b>92</b>

**Steps. II Try – out of the scale**

The scale was administered to 200 University students from two countries (India and Iran). Scoring was done according to specifications given in step –I.

**Step: III Item analysis**

The total scores for the 100 students from India and 100 students from Iran were arranged in a descending order. 27% of the high scores and 27% of the low scores were identified. Then, for each of the 92 items, a t-ratio was computed for the higher and the lower groups to find out the discriminating power of each item. On the basis of the value of t-ratio, 9 items were rejected as they did not discriminate even at 0.05 level of confidence .The t-ratios of the items have been placed in Table below:

**Table: 2**  
**t-ratio for items of first draft of the scale of Attitude towards e-learning**

Factor 1 : perceived usefulness		t-values	
		INDIA	IRAN
1	E-learning can solve many of the educational problems.	2.90	1.83 D*
2	New opportunities for organizing teaching and Learning can be possible through e-learning.	4.62	3.87
3	E-learning saves time and effort for both teachers and students.	3.95	2.82
4	Access to education is increased through e-learning.	4.87	3.71
5	E-learning will enable me to achieve better.	5.25	6.30
6	E-learning can engage learners more than other forms of learning.	2.98	4.96
7	E-learning increases the quality of teaching and learning because it integrates all of media ,print, audio, video and animation	5.22	5.67
36			
8	E-learning increases the flexibility of teaching and learning.	5.43	4.01

9	Interaction between students and teachers is not improved through e-learning.	2.90	3.88
10	Pedagogic value of a course can be enhanced through e-learning.	1.67D*	3.30
11	E-learning has created more problems than it solved.	4.5	2.74
12	E-learning has had little impact on me.	3.46	1.64D*
13	E-learning is as informative as the teacher.	3.02	1.28 D*
14	E-learning will never replace other forms of teaching and learning.	2.88	2.86
15	Universities should adopt more and more e-learning for their students.	5.82	4.24
16	E-learning will enhance my effectiveness in learning.	4.67	4.11
17	E-learning will improve my course performance.	5.95	3.55
18	E-learning will increase my productivity in my course work.	4.3	6.4
19	E-learning will enhance my effectiveness to submit work on time.	5.23	3.36
20	E-learning will enhance my effectiveness to reinforce my knowledge.	4.27	4.16
21	E-learning will enhance my effectiveness to organize my work	3.42	3.94
22	E-learning will enhance my effectiveness to solve problems set by lecturer.	3.30	6.28
23	E-learning will enhance my effectiveness to catch up missed lectures.	3.24	1.18D*
24	E-learning will enhance my effectiveness to work out side of class.	4.94	3.87
25	E-learning will enhance my effectiveness to create presentations.	5.33	4.14
26	E-learning will enhance my effectiveness to conduct research.	3.62	3.44
27	In areas with low or limited internet users, usefulness of e-learning is suspect.	0.54 D*	1.47 D*
28	E-learning will enhance my effectiveness to present written work in front of the class.	4.32	5.56
29	Use of e-learning as a complimentary rather than supplementary learning process has not been highlighted.	0.54 D*	1.086D*

30	E-learning is too time consuming to use.	3.70	2.65D**
31	E-learning will enhance my effectiveness to engage with the subject in class.	1.15 D*	2.11 D**
32	E-learning will enhance my effectiveness to develop my understanding.	3.75	2.37D**
<b>Factor 2 : Intention to adopt e-learning :</b>			
33	E-learning makes me uncomfortable because I don't understand it.	4.58	3.48
34	E-learning is a de-humanizing process of learning.	6.34	4.45
35	E-learning is not effective for student learning.	6.30	1.74D*
36	I feel intimidated by e-learning.	2.03	3.14
37	I get a sinking feeling when I think of trying to use e-learning for my courses.	4.98	3.45
38	I dislike the idea of using e-learning.	4.1	5.58
39	I feel highly motivated to take an e-learning course	4.1	4.08
40	I believe it is a good idea to use e-learning for my course.	4.72	0.38D*
41	Using e-learning is a foolish idea.	6.53	1.35D*
42	I find e-learning easy to use.	3.28	1.86 D*
43	I am not in favor of full time e-learning as it lacks the face – to- face interaction between students and educators.	1.48 D*	4.11
44	I am not in favor of e-learning as it leads to social isolation.	3.41	2.32 D**
45	I am not in favor of e-learning as it lacks appropriate content.	5.08	1.94D*
46	I think positively about e-learning.	3.34	4.62
47	I plan to participate in future e-learning courses.	3.22	3.66
48	I plan to buy a computer to be able to follow lectures notes online.	5.37	5.43

49	I intend to advise my friends to use the internet for reading lecture's notes Online.	5.75	3.52
----	---	------	------

50	I will also use e-learning in the future.	5.1	2.31 D**
51	I don't know what I would do without e-learning.	1.01 D*	2.25 D**
52	E-learning doesn't interest me.	0.75 D*	2.4 D**
53	Using e-learning makes learning fun.	2.38 D**	0.98 D*
<b>Factor 3 : Ease of e-learning use</b>			
54	I can't read the lectures notes through the web.	3.6	2.49 D**
55	I can't learn courses through the web.	5.63	4.25
56	It is easy to learn how to use the internet in reading lecture's web notes.	2.06 D**	0.96 D*
57	It is difficult to learn by using e-learning.	3.59	4.91
58	It is difficult to acquire any significant information by using internet.	3.42	1.88D*
59	It is difficult to express my thoughts and ideas by writing through e-learning.	8.49	2.51D*
60	It is difficult to take responsibility for my own learning by using e-learning.	7.66	3.65
61	It is difficult to communicate effectively with others by using e-learning.	2.94	5.27
62	E-learning systems are easy to master.	2.50 D**	3.26
63	My interaction with e-learning is not clear and understandable.	5.20	4.85
64	I learn better through face – to –face contact with tutors and other learners than by Using computer.	2.77	5.97
65	I read better from a printed source such as a book or handout rather than from a computer screen.	2.38 D**	3.65
66	I find using the internet to be slow.	3.69	1.86D*
67	I find using e-learning to be easier than using the library.	2.1	1.18D*
68	I feel students are becoming slaves to technology.	3.86	3.83

<b>Factor 4 :Technical and pedagogical support</b>			
--	--	--	--

69	My university has got the technology needed for the delivery of e-learning.	4.66	5.87
70	My university has an updated website.	4.25	4.35
71	My university doesn't have adequate electronic resources (E.journal, E.books) to stimulate my learning activities.	6.95	3.77
72	My university doesn't have adequate electronic resources (E.journal, E .books) to stimulate my research activities.	6.41	5.006
73	My university doesn't have technical assistance when I seek help from the campus support services.	5.89	3.21
74	My university doesn't have adequate funding to purchase updated hardware and software as needed.	6.18	4.75
75	My university has trained professionals available to carry out e-learning training programs.	1.93 D*	4.78
76	In my university faculty member are very motivated towards adopting e-learning.	4.22	5.93
77	In my university faculty member prefer traditional ways of teaching and research.	2.82	2.46 D**
78	In my university faculty member categorize e-learning more as research rather than teaching.	2.70	2.87
<b>Factor 5 : E-learning stressors</b>			
79	I feel anxious about my ability to use e-learning.	3.49	2.51D**
80	I get stressed about slow internet connections while using e-learning.	6.74	5.17
81	I get stressed by my department computers while using e-learning.	8.20	2.68
82	I feel pressured by using e-learning.	9.91	1.45 D*
83	I feel pressured by my teachers to use E-learning for my research activities.	8.63	1.75D*
84	I feel pressured by my teachers to use E-learning for my learning activities.	11.44	6.4

85	I feel pressured by my older peers to use E-learning.	7.40	8.28
----	---	------	------

86	I feel pressured by my younger peers to use E-learning.	9.09	7.77
87	I feel pressured by my department unreliable equipment to use e-learning.	6.27	5.57
88	I tend to avoid using electronic resources as I cannot effectively utilize the Services offered.	4.78	4.08
<b>Factor 6: pressure to use e-learning:</b>			
89	E-learning should be offered fully online to reach students living in remote areas.	7.61	8.73
90	E-learning should be used to reduce travel related stress.	8.99	8.02
91	E-learning should be adopted to allow married students to balance family and Study demands.	9.46	10.37
92	E-learning should be adopted to allow working students to study from home.	8.29	8.47

D\* - Not Significant at 0.05 level D\*\* - Not Significant at 0.01 level

#### **StepS: IV Final draft of the scale**

The final draft of the scale comprised of 83 items in the following 4 domains as shown in Table: 3. Distribution of positive and negative statements has been presented in Table: 4.

**Table: 3  
Distribution of items of scale of Attitude  
towards e-learning in various Domains**

Domain	Item No
Perceived usefulness	From 1 till 29
Intention to adopt e-learning	From 30 till 47
Ease of e-learning use	From 48 till 60
Technical and pedagogical support	From 61 till 70
E-learning stressors	From 71 till 79
pressure to use e-learning	From 80 till 83
<b>Total</b>	<b>83</b>

**Table: 4  
Distribution of Positive and Negative Statements in the  
Scale of Attitude towards e-learning**

Item Type	Items Nos
Positive items	44
Negative items	39
<b>Total</b>	<b>83</b>



**StepS: V Reliability and validity of the Scale**

Reliability is the consistency of a set of measurements or measuring instrument, often used to describe a [test](#). Reliability is inversely related to [random error](#). Reliability may be estimated through a variety of methods that fall into two types: single-administration and multiple-administration. Multiple-administration methods require that two assessments are administered. In the [test-retest](#) method, reliability is estimated as the [Pearson product-moment correlation coefficient](#) between two administrations of the same measure. In the alternate forms method, reliability is estimated by the Pearson product-moment correlation coefficient of two different forms of a measure, usually administered together. Single-administration methods include split-half and [internal consistency](#).

The split-half method treats the two halves of a measure as alternate forms. This "halves reliability" estimate is then stepped up to the full test length using the [Spearman-Brown prediction formula](#). The most common internal consistency measure is [Cronbach's alpha](#), which is usually interpreted as the mean of all possible split-half coefficients. Cronbach's alpha is a generalization of an earlier form of estimating internal consistency, [Kuder-Richardson Formula 20](#) (Cortina, 1993).

Cronbach's  $\alpha$  (alpha) is a [statistic](#). It is commonly used as a measure of the [internal consistency](#) or [reliability](#) of a [psychometric test score](#) for a sample of examinees. It was first named as alpha by [Lee Cronbach](#) in 1951, as he had intended to continue with further coefficients. The measure can be viewed as an extension of the [Kuder-Richardson Formula 20](#) (KR-20), which is the measure's equivalent for dichotomous items. Alpha is not robust against missing data. Several other Greek letters have been used by later researchers to designate other measures used in a similar context (Cronbach, 1951). In the current study the method of [internal consistency](#) was used and [Cronbach's alpha](#), which is also used as the measure of internal consistency. The reliability of the total test was .834 which is considered very well (Hair et al. 1998). In addition, Table 5 shows the reliability of the measurement scale for each subscale.

**Table: 5**  
Cronbach's alpha reliability for different domains of Attitude towards e-learning

Coun try	Domain	Cronbach' s alpha	Total (Reliability between domain and total )
India	Perceived usefulness of e-learning	0.70	0.61
	Intention to adopt e-learning	0.65	0.60
	Ease of e-learning use	0.65	0.59
	Technological and pedagogical support	0.60	0.55
	E-learning stressors	0.84	0.70
	Pressure to use e-learning	0.65	0.56
	Perceived usefulness of e-learning	0.80	0.81
	Intention to adopt e-learning	0.60	0.55
	Ease of e-learning use	0.68	0.57
	Technological and pedagogical	0.60	0.55

	<b>support</b>		
	<b>E-learning stressors</b>	<b>0.68</b>	<b>0.57</b>
	<b>Pressure to use e-learning</b>	<b>0.77</b>	<b>0.55</b>
<b>Total</b>	<b>Perceived usefulness of e-learning</b>	<b>0.75</b>	<b>0.69</b>
	<b>Intention to adopt e-learning</b>	<b>0.74</b>	<b>0.68</b>
	<b>Ease of e-learning use</b>	<b>0.70</b>	<b>0.65</b>
	<b>Technological and pedagogical support</b>	<b>0.61</b>	<b>0.56</b>
	<b>E-learning stressors</b>	<b>0.79</b>	<b>0.66</b>
	<b>Pressure to use e-learning</b>	<b>0.71</b>	<b>0.57</b>

Validity refers to the accuracy of an assessment whether or not it measures what it is supposed to measure. Even if a test is reliable, it may not provide a valid measure.

In this study, face validity and content validity of the scale was ensured through consultation with faculty members from different departments of Panjab university, Computer Science, Mass Communication, Correspondence Education, Education, English from the first draft till the last draft of the scale of attitude towards e-learning. A copy of the final draft of the scale has been placed in Appendix .

## CONCLUSION

Firstly, ninety two items were developed on six domains as Perceived usefulness; Intention to adopt e-learning; Ease of e-learning use; Technical and pedagogical support; E-learning stressors; Pressure to use e-learning. In the stage of Try – out of the scale, The scale was administered to 200 University students from two countries (India and Iran). The total scores for the 100 students from India and 100 students from Iran were arranged in a descending order. 27% of the high scores and 27% of the low scores were identified. Then, for each of the 92 items, a t-ratio was computed for the higher and the lower groups to find out the discriminating power of each item.

On the basis of the value of t-ratio, 9 items were rejected as they did not discriminate even at 0.05 level of confidence. For the reliability of the test, the method of [internal consistency](#) was used and [Cronbach's alpha](#), which is also used as the measure of internal consistency. The reliability of the total test was .834 which is considered very well (Hair et al. 1998).

## BIODATA and CONTACT ADDRESS OF AUTHOR



born 5 September, 1959 , at Chandigarh , India. She completed her higher education from Panjab University , Chandigarh. She received the Ph.D. grade in instructional systems design. Her area of specialization is educational technology and research. She has written 2 books and 35 papers and has done some research projects. She has about 22 years of research and teaching experience and has guided

15 national and international students for Ph.D.

### **Vandana MEHRA**

Associate Professor, Department of Education, Panjab University, Chandigarh, INDIA  
Work address: Department of Education,  
Panjab University, Chandigarh, INDIA  
Phone: +91-981501



**Dr Faranak OMIDIAN** is an Assistant Professor at Education, Department of Educational Sciences, Education Faculty, Islamic Azad University. She obtained her Ph.D degree from Panjab University, Chandigarh, the Department of Educational Sciences, In 2010. Her main research interests are e-learning, computer anxiety, Computer self efficacy and educational management.

### **Faranak OMIDIAN**

Assistant Professor, Islamic Azad University, Dezfool Branch, IRAN  
Home address: NO. 212 , 22 BAHMAN Street, Dezfool, IRAN  
Phone: +986424222340  
Email: [f.omidian@gmail.com](mailto:f.omidian@gmail.com)

### **REFERENCES**

- Al- doub, E., Goodwin R., & Al – Hunaiyyan, A. (2008). *Students 'attitudes toward E-learning in Kuwait's higher education institutions*. Retrieved from <http://www.apsce.net/icce2008/papers/ICCE2008-paper202.pdf>
- Asan, A. & Koca, N. (2006). An Analysis of students' Attitudes Towards Internet. Current Developments in technology –Assisted Education (2006). Retrieved from <http://www.formatex.org/micte2006/pdf/2120-2124.pdf>
- Ajzen, I. & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*, Englwood cliffs, NJ: Prentice Hall.
- Becta. (2008). Survey of FE learners and e-learning GfK NOP Social Research Reports. Retrieved from [http://research.becta.org.uk/upload-dir/downloads/page\\_documents/research/fe\\_learners\\_report.pdf](http://research.becta.org.uk/upload-dir/downloads/page_documents/research/fe_learners_report.pdf)
- Breckler, S. J., & Wiggins, E. C. (1992). On defining attitude and attitude theory: Once more with feeling. In A. R. Pratkanis, S. J. Breckler, & A. C. Greenwald (Eds.), *Attitude structure and function*. Hillsdale, NJ: Erlbaum. pp. 407-427.
- Burgess, A. L. (2003). WebCT as an E-Learning Tool: A Study of Technology students' perceptions. *Journal of Technology Education*, 15(1), Fall2003 Retrieved from <http://scholar.lib.vt.edu/ejournals/JTE/v15n1/burgess.html>
- Buzzetto –More, N. A. (2008). Student Perceptions of E-learning Components Interdisciplinary. *Journal of E- learning and Learning Objects*. Volume 4, 2008. Retrieved from <http://www.ijello.org/Volume4/IJELLOv4p113-135Buzzetto413.pdf>
- Childs, S., Blenkinsopp, E., Hall, A., & Walton, G. (2005 ). Effective e-learning for health professionals and students--barriers and their solutions. A systematic review of the literature--findings from the HeXL project. *Health information and libraries journal*. <http://www.ncbi.nlm.nih.gov/pubmed/16279973>

- Cooner, T. S., & Hickman, G. (2008). Child Protection Teaching : Students' Experiences of a Blended Learning Design. *Social Work Education*. Vol 27, No. 6, September 2008, pp.647-657. Retrieved from <http://www.informaworld.com/smpp/content~content=a901336998&db=all>
- Davis, F. D. (1989). Perceived usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, pp. 319-339.
- Ellis, R, A, Ginns, P, & Piggott, L. (2009). E-learning in higher education : some key aspects and their relationship to approaches to study. *Higher Education Research & Development*. Vol. 28, No.3, June 2009, 303-318 Retrieved from <http://www.informaworld>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Gay, G., Mahon, S., Devonish, D., Alleyne, P., & Alleyne, P. (2006). Perceptions of information and communication technology among undergraduate management students in Barbados. *International Journal of Education and Development Using Information and Communication Technology(IJEDICT)*, 2006, Vol, 2, Issue 4, pp, 6-17
- Gururajan, V. & Low, E. K. (2004). Using ICT tools to manage knowledge : A student perspective in determining the quality of education. Retrieved from [http://eprints.usq.edu.au/218/1/QIK\\_2005\\_Conference\\_viji's\\_paper.pdf](http://eprints.usq.edu.au/218/1/QIK_2005_Conference_viji's_paper.pdf)
- Hao, Y, W. (2004). Students 'Attitudes toward Interaction in Online Learning: Exploring the Relationship between Attitudes, Learning Styles, and Course Satisfaction (Doctoral dissertation). Retrieved from <http://www.lib.utexas.edu>
- Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2004). The Role of Social presence and Moderating Role of Computer self-efficacy in Predicting the Continuance Usage of E-learning Systems. *Journal of Information Systems Education*, 15:2; pp. 139-155.
- Hashim, H. R. H., & Mustapha, W. N. (2004). Attitudes toward learning about and working with computers of students at UITM. *The Turkish Online Journal of Educational Technology-TOJET* April 2004 ISSN : 1303-Volume 3 issue 2.
- Haywood, J., Macleod, H., Haywood, D., Money, N., & Alexander, W. (2004) *The Student View of ICT in Education at the University of Edinburgh: skills, attitudes & expectations*. Retrieved from <http://homepages.ed.ac.uk/jhaywood/papers/studentviews.pdf>
- Harris, R. W. (1999). Attitudes Toward End-user Computing : A Structural Equation Model, *Behavior and Information Technology* (18:2) 1999 ,pp.109-125.
- Ibrahim, D, Z., Silong, A. D & Samah, B. A. (2002). Readiness and Attitude Towards Online learning among virtual students. Paper Presented at the 15 Annual Conference of the Asian Association of Open Universities, 21- 23 Feb. 2002, New Delhi.
- Jones, H. G., & Jones, H. B. (2005). A Comparison of Teacher and Student Attitudes Concerning Use and Effectiveness of Web-based Course Management Software. *Educational Technology & Society*, 8(2),125-135, Retrieved from [http://www.ifets.info/journals/8\\_2/12.pdf](http://www.ifets.info/journals/8_2/12.pdf).

Keller, C. & Cernerud, L. (2002). Students' Perceptions of E-learning in University Education. *Journal of Educational Media*, Vol. 27, Nos. 1–2, 2002. Retrieved from <http://education.korea.ac.k>

Khan, B. H. (2005). *Managing e-learning: Design, delivery, implementation, and evaluation*. Hershey, PA: Information Science Publishing. (Website: <http://BooksToRead.com/elearning>) In : J., Yaghoubi, M., I. Mohammadi, H Iravani, M., Attaran & A., Gheidi, (2008). *Virtual students' perceptions of E-learning In Iran*. The *Turkish Online Journal of Educational Technology –TOJET* July 2008 ISSN : 1303-6521 VOL 7, Issue 3, Article 10.

Khunyakari, R., Mehrotra, S., Natarajan, C., & Chunawala, S. (2006). Studying Indian Middle School Students' Attitudes towards Technology. Proceedings of episteme 3. [http://web.gnowledge.org/episteme3/pro\\_pdfs/13-ritesh-sm-cn-sc.pdf](http://web.gnowledge.org/episteme3/pro_pdfs/13-ritesh-sm-cn-sc.pdf)

Kwun, O, Alshare, K. & Grandon , E. (2005). Instructor and student perceptions of the online teaching/learning environment: A cross cultural study. *Academy of educational leadership journal*, volume 9, Number 3, 2005 Retrieved from <http://www.alliedacademies.org/Publications/Papers/AELJ%20Vol%209%20No%203%202005%20p%20105-130.pdf>

Laurillard, D. (1993). *Rethinking university teaching :A framework for the effective use of educational technology*. London: Routledge.

Leem, J. & Lim, B. (2007). The current status of e-learning and strategies to enhance educational competitiveness in Korean higher education. *International review of research in open and distance learning* volume 8, Number 1. ISSN:1492-3831.

Link, M.T. & Marz, R. (2006). *Computer literacy and attitudes towards e-learning among first year medical students*. <http://www.biomedcentral.com> 1472-6920/6/34

Martinze, J. G. (2004). Attitudes towards new technologies: A students' perspective at inter American university of Puerto Rico. Retrieved from <http://home.arcor.de/breiden/Brad/DBA-DISS-2000-2001>.

Masrom, M. (2007). Technology Acceptance Model and E-learning, 12th International Conference on Education, Sultan Hassanali Bolkuiah Institute of Education Universiti Brunei Darussalam 21-24 May [http://eprints.utm.my/5482/1/MaslinMasrom2006\\_Tech.pdf](http://eprints.utm.my/5482/1/MaslinMasrom2006_Tech.pdf)

Marie-Louise, L. J. , Loria, K , Mostaghel, R., & Saha, P. (2009) . E-Learning: Investigating University Student's Acceptance of Technology. *European Journal of Open, Distance and E-learning*. Retrieved from <http://www.euodl.org/?keyword=e-learning&article=334>

Neo, M., Neo, T, K., & Yap, W, L. ( 2008). Students 'perceptions of interactive multimedia mediated web-based learning: A Malaysian perspective. proceedings ascilite Melbourne 2008 : Full paper : Neo, Neo & Yap

Oh, C. H. (2003). Information communication technology and the new university: A view on e-learning. *The Annals of the American Academy* (585): 134-153.

Ong, C. H., & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in Human Behavior* 22(5), 816-829.

- Ostlund, B. (2008). Prerequisites for interactive learning in distance education : Perspectives from Swedish students. *Australasian Journal of Educational Technology*. 2008, 24(1), 42-56.
- Paris, P. G. (2004). E-Learning: A study on Secondary Students' Attitudes towards Online Web Assisted Learning. *International Education Journal*/Vol 5, No 1, 2004  
<http://ehlt.flinders.edu.au>
- Palmer, S. A., & Holt, D.M. (2009). Students' perceptions of the value of the elements of an online learning environment : looking back in moving forward. *Interactive Learning Environments*. 2009, 1-17, First article. Retrieved from <http://www.informaworld.com>
- Perez Cereijo , M . (2006). Attitude as predictor of success in online Training. *International Journal on E-learning*. vol 5,No.4, pp.623-639.chesapeake,va:ACE. Retrieved from [http://goliath.ecnext.com/coms2/gi\\_0199-5866230/Attitude-as-predictor-of-success.html](http://goliath.ecnext.com/coms2/gi_0199-5866230/Attitude-as-predictor-of-success.html). Retrieved on 30 Sep 2008.
- Ray, C, M., Sormunen, C., & Harris, T, M. (1999). Men's and Women's Attitudes Toward Computer Technology: A Comparison. *Office Systems Research Journal*, vol. 17, no. 1, Spring 1999. Retrieved from <http://citeseerx.ist.psu.edu>
- Rezaei, M., Movahed Mohammadi, H., Asadi, A., & Kalantary, K. (2008). Predicting E-learning Application In Agricultural Higher Education Using Technology Acceptance Model. *Turkish Online Journal of Distance Education-TOJDE*, January 2008 ISSN 1302-6488 Volume: 98 Number: 1 Article. Retrieved from [http://tojde.anadolu.edu.tr/tojde29/articles/article\\_5.htm](http://tojde.anadolu.edu.tr/tojde29/articles/article_5.htm)
- Sam, K. H., Othman,A.E.A.& Nordin, Z.S. (2005). Computer self-Efficacy, Computer Anxiety, and Attitudes toward the internet: A study among Undergraduates in Unimas. *Educational technology & society*, 8(4), 205 – 219.
- Smart, K, L., & Cappel, J, J. (2006). Students' Perception of Online Learning : A Comparative Study. *Journal of information Technology Education*. volume 5,2006. Retrieved from <http://informingscience.org/jite/documents/Vol5/v5p201-219Smart54.pdf>
- Svirko, E., & Mellanby, J. (2008). Assessed attitudes to e-learning, learning style and achievement in learning neuroanatomy by medical students. *Medical Teacher* Volume 30, Issue 9 & 10 2008, pages 219-227. Retrieved from <http://www.informaworld.com/smpp/content~db=all~content=a907312169>
- Theyßen, H., & Hahn-Allee, O. (2009). Student's attitudes towards the Hypermedia learning Environment " physics for medical students. *European Journal of Open, Distance and E-learning*. Retrieved from <http://www.eurodl.org/?keyword=e-learning&article=239>
- Usun, S. (2003). Undergraduate students attitudes towards educational uses of internet. *Interactive educational multimedia*, Vol 7 (October 2003), pp. 46-62. Retrieved from [http://www.ub.edu/multimedia/iem/down/c7/IEM\\_number7.pdf](http://www.ub.edu/multimedia/iem/down/c7/IEM_number7.pdf)
- Upton, D. (2006). Online learning in speech and language therapy : student performance and attitudes. *Education for Health*, Vol 19, No. 1, March 2006, 22-31  
[http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content\\_storage\\_01/0000019b/80/3f/7d/f7.pdf](http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/3f/7d/f7.pdf)

Valenta, A. (2001). Identifying students attitudes and learning styles in distance learning. *JALN* (5) Issue 2, September 2001 Retrieved from <http://repository.maestra.net/valutazione/MaterialeSarti/articoli/ValentaEtAl%20-%20Student%20Attitudes%20in%20DL.pdf>

Van Raaij, E.M., & Schepers, J.J.L. (2008). The Acceptance and Use of a Virtual Learning Environment in china. *Computers and Education*, 50(3), pp. 838-852.

Venkatech, V. (2000). Determinants of the perceived Ease of Use: Integrating Control, Intrinsic Motivation and Emotion into the Technology Acceptance model. *Information systems Research*, 11, 4, 342-365.

Yaghoubi, J., Mohammadi, M., I., Iravani, H., Attaran, M. & Gheidi, A. (2008). Virtual students' perceptions of E-learning In Iran. *The Turkish Online Journal of Educational Technology-TOJET* July 2008 ISSN : 1303-6521 VOL 7, Issue3, Article10 Retrieved from

Zanna, M., P., & Rempel, J. K. (1988). Attitudes: A new look at an old concept. In D. Bar-Tal & A. W. Kruglanski (Eds.). *The social psychology of knowledge* (pp. 315–334). Cambridge, UK: Cambridge University Press.

Zaraii Zavaraki, E. (2003) . Use of network communications in academic transactions by university teachers and its impact on learning outcomes of postgraduate students. Unpublished Doctoral dissertation. University of Panjab, Chandigarh, India.

#### APPEDIX: cale to measure attitude towards e-learning

		SA	A	U	D	SD
1	e-learning can help solve many of the educational problems.					
2	New opportunities for organizing teaching and Learning can be possible through e-learning .					
3	e-learning saves time and effort for both teachers and students.					
4	Access to education is increased through e-learning.					
5	e-learning will enable me to achieve better .					
6	e-learning can engage learners more than other forms of learning .					
7	e-learning increases the quality of teaching and learning because it integrates all of media ,print, audio, video and animation					
8	e-learning increases the flexibility of teaching and learning .					
9	Interaction between students and teachers is not improved through e-learning .					
10	Pedagogic value of a course can be enhanced through e-learning technologies .					
11	e-learning has created more problems than it solved .					
12	e-learning has had little impact on me .					
13	e-learning is a valuable source of information .					
14	e-learning will never replace other forms of teaching and learning .					

15	Universities should adopt more and more e-learning for their students.					
16	e-learning will enhance my effectiveness in					

	learning .					
17	e-learning will improve my course performance					
18	e-learning will increase my productivity in my course work					
19	e-learning will enhance my effectiveness to submit work on time .					
20	e-learning will enhance my effectiveness to reinforce my knowledge .					
21	e-learning will enhance my effectiveness to organize my work					
22	e-learning will enhance my effectiveness to solve problems set by the teacher					
23	e-learning will help me to catch up with missed lectures.					
24	e-learning will enhance my effectiveness to work out side the class .					
25	e-learning will enhance my effectiveness to create presentations.					
26	e-learning will enhance my effectiveness to conduct research .					
27	e-learning will enhance my effectiveness to present written work in front of the class					
28	e-learning is too time consuming to use .					
29	e-learning will enhance my effectiveness to develop my understanding					
30	e-learning makes me uncomfortable because I don't understand it .					
31	e-learning is a de-humanizing process of learning .					
32	e-learning is not effective for student learning .					
33	I feel intimidated by e-learning .					
34	I get a sinking feeling when I think of trying to use e-learning for my courses .					
35	I dislike the idea of using e-learning .					
36	I feel highly motivated to take an e-learning course					
37	I believe it is a good idea to use e-learning for my course.					
38	I find e-learning easy to use .					
39	I am not in favor of full time e-learning as it lacks the face – to- face interaction between students and educators .					
40	I am not in favor of e-learning as it leads to social isolation .					
41	I am not in favor of e-learning as it lacks appropriate content .					
42	I think positively about e-learning .					
43	I plan to participate in future e-learning courses.					
44	I plan to buy a computer to be able to follow lectures notes online					
45	I intend to advise my friends to use the internet for reading lecture's notes Online .					
46	I intend to use e-learning in the future .					
47	Using e-learning makes learning enjoyable .					
48	I can't learn courses through the web only .					
49	It is easy to use the web for online notes/ educational resources .					

50	It is difficult to learn by using e-learning .					
51	It is difficult to acquire significant information by using internet.					



52	<b>It is difficult to express my thoughts and ideas while submitting online responses .</b>					
53	<b>It is difficult to take responsibility for my own learning by using e-learning .</b>					
54	<b>It is difficult to communicate effectively with others by using e-learning / software .</b>					
55	<b>e-learning systems are easy to master .</b>					
56	<b>My interaction with e-learning content is not clear and understandable.</b>					
57	<b>I learn better through face-to-face contact with tutors and other learners than by Using computer.</b>					
58	<b>I find it better to read from a printed source such as a book or handout rather than from a computer screen.</b>					
59	<b>I find using e-learning to be easier than using books/journals in the library.</b>					
60	<b>I feel students are becoming slaves to technology .</b>					
61	<b>My university has got the technology needed for the delivery of e-learning.</b>					
62	<b>My university has an updated website .</b>					
63	<b>My university doesn't have adequate electronic resources ( E.journal , E .books) to stimulate my learning activities .</b>					
64	<b>My university doesn't have adequate Electronic resources(E.journal, E.books) to stimulate my research activities.</b>					
65	<b>My university doesn't have technical assistance when I seek help from the campus support services .</b>					
66	<b>My university doesn't have adequate funding to purchase updated hardware and software as needed .</b>					
67	<b>My university has trained teachers available to carry out e-learning training programs</b>					
68	<b>In my university faculty members are very motivated towards adopting e-learning</b>					
69	<b>In my university faculty members prefer traditional ways of teaching and research .</b>					
70	<b>In my university faculty members encourage students to use e-learning more for research rather than teaching .</b>					
71	<b>I feel anxious about my ability to use e-learning .</b>					
72	<b>I get stressed by slow internet connections while using e-learning .</b>					
73	<b>I get stressed by my department computers while using e-learning .</b>					
74	<b>I feel pressured by my teachers to use e-learning for my research activities .</b>					
75	<b>I feel pressured by my teachers to use e-learning for my learning activities.</b>					
76	<b>I feel pressured by my older peers to use e-learning.</b>					
77	<b>I feel pressured by my younger peers to use e-learning</b>					

78	<b>I feel stressed by my department's unreliable equipment to use e-learning .</b>					
79	<b>I tend to avoid using electronic resources as I</b>					

	<b>can not effectively utilize the services offered by the university .</b>					
<b>80</b>	<b>e-learning should be offered fully online to reach students living in remote areas.</b>					
<b>81</b>	<b>e-learning should be used to reduce travel related stress.</b>					
<b>82</b>	<b>e-learning should be adopted to allow married students to balance family and study demands .</b>					
<b>83</b>	<b>e-learning should be adopted to allow working students to study from home .</b>					

**Strongly agree : SA Disagree : D Agree : A Strongly Disagree :SD Undecided : U**