Assessing e-Learning Readiness of University Faculty in India

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Abstract—*Thanks to the rapid advancements in ICTs coupled with gradual & regulated expansion of telecommunication sector, the increasing adoption of e-learning in higher education is gaining momentum in India as well as globally. The chief stakeholders – students, teachers and administrators– are fully aware of its importance in enhancing the learning outcomes. However, the e-learning readiness of the providers, i.e. faculty, is critical in ensuring that e-learning achieve its due share in the process of teaching and learning. The present study was conducted to assess the e-learning readiness of teachers of a premier State Agriculture University (SAU) in North India. Stratified random sampling with proportional allocation method was used for selecting the sample. The study findings indicate that the faculty is 'ready but needs little improvement' whereas e-learning readiness of the University under study was found to be 3.74 (on a scale of 5.0). Further, the computer literacy was found to be significantly co-related with faculty's attitude readiness, cultural readiness and total e-learning score. Perceived usefulness was found to be significantly co-related with attitude readiness, cultural readiness and financial readiness; and behavioral intention was significantly co-related with technological skill readiness, human resource readiness and environmental readiness.*
Keywords: e-learning, readiness, e-learning readiness

Introduction

There is a common understanding that the twenty-first century will be a more globalized and knowledge-based era. The advancements in information and communication technologies (ICTs) have culminated in a new dynamics of teaching and learning, and are providing new ways of interacting and learning. E-learning has emerged as an important educational tool and provided the teachers a new instrument to expand the learning opportunities and enhance the learning outcomes. The higher educational institutions, in order to be relevant and competitive in a globalised networked world, need to invest heavily in ICTs infrastructure and develop appropriate mechanism to advance e-learning readiness of their teachers besides developing a policy framework to promote e-learning. The Universities have also recognised the critical importance of e-learning in an institutional setting, and are making effort to be e-ready and also assessing e-learning readiness of teachers as well as students.

E-learning represents an innovative shift in the field of learning, providing rapid access to specific knowledge and information, and offers online instruction that can be delivered anytime and anywhere through a wide range of electronic learning solutions such as a web-based courseware and online discussion groups. Khan (2005) observed that explosive growth in Information Technology (IT) and new developments in learning science provides opportunities to create well-designed, learner-centered, meaningful distributed and facilitated e-learning environments. Nowadays, e-learning has become an accepted educational paradigm across universities worldwide (OECD, 2005). Liaw.et al. (2007) observed that the trend of using e-learning as learning and/or teaching tool is now rapidly expanding into education sector. Aydın and Taşçı's (2005) e-learning assessment model was adopted to analyse the expected level of readiness of SAUs.

Definition of e-learning

There are many definitions given to e-learning. E-learning (which stands for electronic learning) refers to the use of ICTs to enhance and/or support learning in higher education. Liaw, Huang, and Chen (2007) define e-learning as the convergence of technology and learning, and as the use of network technologies to facilitate learning anytime, anywhere. However, in today's technologically-driven age, e-learning has become an important tool for enhancing the delivery, interaction, and facilitation of both teaching and learning processes. The Commission on Technology and Adult Learning (2001) defined e-learning as instructional content or learning experiences delivered or enabled by electronic technology

With the increasing enrollments of students in higher education institutes/universities every year, it has become imperative to introduce some alternative method of imparting education. Online courses, hybrid courses through e-learning are a solution to this. Swatman (2006) mentioned that for e-learning implementation to succeed there is a need to acknowledge the importance of assessing the readiness of stakeholders (organizations, teachers and learners) to adopt this learning style. E-learning is destined to be the future of learning worldwide as it offers the remarkable advantages of economy besides the enhancement in learning outcomes and academic achievements.

The demand for a well-educated workforce has driven many countries to rethink and redesign their education systems. An education system has to be suited to the demands of the technological age so that a competitive edge can be maintained. Such demand for a technology savvy workforce is reflected in Alvin Toffler's declaration (in Rosenberg, 2001), that "the illiterate of the 21st century will not be those, who cannot read and write but those who cannot learn, unlearn, and relearn." This indicates that learning institutions will have to constantly change and adapt in their environments if they are not to lag behind.

E-learning Readiness:
As e-learning gains popularity across educational institutions in developing countries, the users' as well as providers' readiness will become critical. Aydın and Taşçı's (2005) observed that it needs to address the issues related to technical readiness, content readiness, human resources readiness and financial readiness. Further, there are demographic factors such as age, education, gender (of providers) that may have an impact on e-learning readiness, and thus are considered as important factors in e-learning readiness. For the present study, e-learning readiness was conceptualised as the ability (competency) of the providers of e-learning (i.e. teachers) in a given context.

A number of researchers and theorists have suggested different models/ frameworks which can be used for assessing e-learning readiness organisations across many sectors. In the present study, Comprehensive Organisational e-learning Readiness Instrument (COERI) developed by Retisa Mutiaradevi (2009) for measuring e-learning Readiness in the Forestry Research and Development Agency of Indonesia was used with minor modification to suit the context of present study. The COERI Scale comprised of the following eight indicators: (1) Technological skills readiness (2) Equipment/infrastructure readiness (3) Online learning style readiness (4) Attitude readiness (5) Human resources readiness (6) Cultural readiness (7) Environmental readiness and (8) Financial readiness. These indicators, together, represented the e-learning readiness of an SAU under study.

When implementing e-learning frameworks in an institution of higher education, we need to focus on readiness of teachers which will be critical to its success. They need to be skilled in the use of ICTs and trained in how to develop the course materials for e-learning besides pedagogical approaches.

Theoretical Background
Technology Acceptance Model (TAM) given by Davis (1989) was used in predicting the user acceptance of any information technology system and to diagnose design problems before the users actually use this system through two factors: perceived usefulness (PU) and perceived ease of use (PEU). The core idea of TAM is that user's acceptance of technology is determined by his/her behavioural intention (BI), which in turn is determined by his/her PU and PEU. Behavioural Intention (BI) is strongly related to the learners' actual behavior. Theory of Planned Behavior (TPB) is another model by Taylor and Todd (2001) grounded on sociology that has been used to explain social behavior and information use. It lays emphasis on the "perceived ease or difficulty of performing the behavior". The TPB views the control that people have over their behavior as lying on a continuum from behavior that are easily performed, to those that require considerable effort. Thus, the Theory of Planned Behavior was developed incorporating behavioral control factors in predicting behavior.

Tubaishat and Lansari (2011) observed that the evaluation of e-learning readiness is critical for the successful implementation of e-learning as a platform for various learning environments. Success in e-learning can be achieved by understanding the needs as well as the readiness of all stakeholders in a particular e-learning environment. Broadley (2007) observed that teacher's perception and attitude towards e-learning also play a critical role in e-learning implementation.

Against this conceptual framework, the present investigation was carried out to measure e-learning readiness of teachers' in a State Agriculture University (SAU) in Northern India with the following specific objectives.
1. To study socio-personal and psychological characteristics of SAU teachers,
2. To assess their e-learning readiness,
3. To study relationship between socio-personal and psychological characteristics of SAU teachers with their e-learning readiness,

Methodology
The present investigation was carried out in a SAU in northern India. Designation of the faculty was formed the basis of sample selection in the present study. The study sample was selected by using stratified random sampling with proportional allocation. Socio-personal characteristics of Teachers were considered critical while studying e-learning readiness. These included Age, Gender, Educational qualification, Designation, Annual income, Teaching experience, Computer literacy, Achievement motivation, Access to internet facility, mobile phone ownership and use, TAM variables (Perceived usefulness, Perceived ease of use, Attitude towards e-learning)were also studied as independent variables. The e-learning readiness was taken as dependent variable for the study.

The study sample included three designations (Assistant Professor, Associate Professor and Professor) of the faculty members. The sampling was done using stratified random sampling technique with the proportional allocation; $n_{h1} = (N_{h1}/N)*n$

where, n_{h1}= sample size for stratum h1
N_{h1}= population size for stratum h1
N = total population size
n = total sample size

Following the above stated sampling, the study sample comprising 02 Assistant Professors, 13 Associate Professors and 55 Professors (total sample size, N=70) were finally selected for the present study. A structured questionnaire was used for data collection which included close-ended as well as open-ended questions. It was given to the selected respondents. Appropriate statistical measures were used to analyse the collected data.

Results and Discussion
(1). Socio-personal characteristics of respondents:

A number of socio-personal characteristics were included in the present study. The results obtained are presented in table-1.

Table-1: Distribution of respondents according to their socio-personal characteristics.

Categories	No. of teachers (N=70)	
1. Age		
Young (<36)	13 (18.57)	
Middle (36-55)	51 (72.85)	
Old (>55)	6 (8.58)	
2. Gender		
Male	57 (81.42)	
Female	13 (18.57)	
3. Educational qualification		
Masters	11 (15.71)	
Ph.D.	58 (82.85)	
Post doc.	1 (1.42)	
4. Designation		
	Population size	Sample size (N=70)
Assistant Professor	3	2
Associate Professor	15	13
Professor	65	55
5. Annual income		
Low (<6,25,556.70)	17 (24.28)	
Medium (6,25,556.70-11,38,245.00)	42(60)	
High (>11,38,245.00)	11 (15.71)	
6. Teaching Experience		
Less time (<5 years)	8 (11.42)	
Medium (5-23 years)	40 (57.14)	
More time (>23 years)	22 (31.42)	
7. Achievement motivation		
Low (<17.16)	15 (21.42)	
Moderate (17.16-29.58)	49 (70.00)	
High (>29.58)	6 (8.57)	
8. Computer literacy		
Low (<56.2)	10 (14.28)	
Moderate (56.2-75)	55 (78.57)	
High (>75)	5 (7.14)	
9. Access to internet facility		
At office	22 (31.42)	
Office as well as Home	48 (68.57)	
10. Mobile phone ownership & use		
Basic phone	11 (15.71)	
Smart phone (android, windows etc.)	53 (75.71)	
Only Tablets or Phablets	2 (2.85)	
Both (smart phone and tablets)	4 (5.71)	

* *The data in the parenthesis denotes percentage.*

The findings presented in the above table reveals that majority of the respondents (72.85%) belong to the middle age category followed by 18.57% belonging to young age and 8.58% in old age category. Gender-wise, 81.42% were male teachers and 18.57% were female. As regards educational qualifications of teachers, a large majority of respondents (82.85%) were having Ph. D. The break-up in respect of annual income reveals that 60.00% belong to 'medium' category of annual income, and the remaining 24.28% in 'low' and 15.71 in 'high' level of annual income respectively. Further, majority of teachers (57.14%) were in the 'medium' category of their teaching experience (5-23 years) followed by 31.42% with more than 23 years of teaching experience, and the remaining had less than 5 years of teaching experience. It was also seen that, majority, 78.57% were medium computer literate.

Further achievement Motivation, access to internet facility and mobile phone ownership and use were also studied in the present study.

Technology Acceptance by the respondents

'Perceived Usefulness' and 'Perceived Ease of use' are the two important factors that play critical role in acceptance of technology by the prospective us. It has been reported by Davis (1989), that higher levels of PU and PEU predicted favorable attitudes which, in turn, predict behavioral intentions to use. Also, the TAM model suggests that users develop a positive attitude toward technology when they perceive it to be useful and easy to use. The results obtained are presented in the following table 2.

Table 2: Distribution of respondents according to their variables involved in TAM

Categories	No. of teachers (N=70)
1. Perceived Usefulness	
Low (<48.11)	25(35.71)
Moderate (48.11-63.57)	40(57.14)
High (>63.57)	5(7.14)
2. Perceived ease of use	
Low (<50.24)	23 (32.85)
Moderate (50.24-64.28)r	3 (4.28)
High (>64.28)	44 (62.85)

3. Attitude towards e-learning	
Negative (<35.4)	29 (41.42)
Neutral (35.4-49.02)	34 (48.57)
Positive (>49.02)	7 (10)
4. Behavioral Intention	
Low (<20.47)	39 (55.71)
Moderate (20.47-29.15)	26 (37.14)
High (>29.15)	5 (7.14)

* The data in the parenthesis denotes percentage.

The results in the above table reveals that majority of teachers, 57.14% belongs to moderate level of perceived usefulness followed by 35.71 % who belongs to low level and the remaining belongs to high level. The data in the above table reveals that majority of teachers, 62.85% belongs to high level of perceived ease of use followed by 32.85 % who belongs to low level and the remaining belongs to moderate category of perceived ease of use. The data in the above table reveals that majority of teachers, 48.57% had neutral attitude towards e-learning followed by 41.42 % who hold negative attitude and the remaining hold positive attitude towards e-learning. The data in the above table reveals that majority of teachers, 55.71% belongs to low level of behavioral intention followed by 37.14 % who belongs to moderate level and the remaining belongs to high category of behavioral intention.

E-learning Readiness
To determine e-learning readiness of SAU, Aydin and Taşçı's (2005) e-learning assessment model was adopted. He clearly mentioned the expected level of readiness. The items can easily be coded as 1, 2, 3, 4, and 5, as in a five-point Likert type scale. Therefore, the 3.41 mean score can be identified as the expected level of readiness with the item, while other responses enable organizations to show higher or lower levels of readiness. The 3.41 mean average was determined after identifying the critical level: 4 intervals/5 categories = 0.8. As a result of this analysis, the levels of readiness were determined as depicted in following figure.
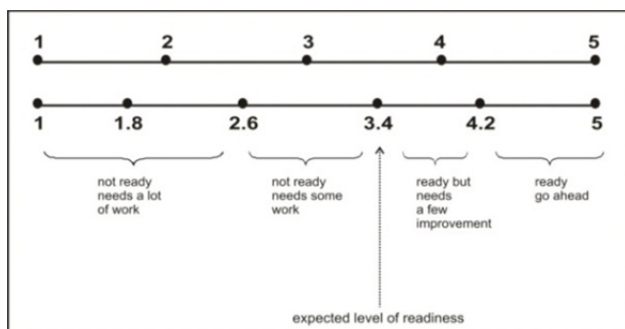

Figure 1: Aydin and Taşçı's (2005) e-learning assessment model.

Table 3: Distribution of respondents with dimensions of Readiness

Item no	e-learning Readiness	Mean	Comments
1	Technological Skills Readiness	3.74	Ready but needs few improvements
2	Online learning style readiness	3.55	Ready but needs few improvements
3	Infrastructure readiness	4.32	Ready go ahead
4	Attitude readiness	3.73	Ready but needs few improvements
5	Human resources readiness	2.83	Not ready needs some work
6	Environmental readiness	3.60	Ready but needs few improvements
7	Cultural readiness	4.19	Ready but needs few improvements
8	Financial readiness	4.24	Ready go ahead
	Mean	3.73	Ready but needs few improvements

The data in the above table reveals that SAU's technological skill readiness (mean=3.74), SAU is ready but needs few improvements. Trainings may be organized for teachers so that they can be equipped with technological skills like using powerpoints, excel and word processor in teaching-learning process, using search engine to access research materials, sending and receiving mails. Online learning style readiness (mean=3.55), means it is ready but needs a few improvements. In this case, trainings may be organized which aims to take notes while watching a video clip and relate the content to the given information, using online tools like email and chat., infrastructure readiness (mean=4.321) it is ready to go ahead, attitude readiness (mean=3.728), it is also ready but needs few improvements, workshops may be arranged to create interest in the use of technology in education so that teachers may develop a positive attitude towards computers and technology. Environmental readiness (mean=3.59), SAU is ready but needs few improvement, cultural readiness (mean=4.187) is ready but needs few improvements. Human resource readiness (mean=2.825) means 'not ready, needs some work'. In this case, trainings may be organized for teachers so that they can create web pages, make good study guides for e-learning students, moderate online discussions.

Overall, we can say that the SAU is ready but needs little improvement regarding e-learning readiness.

Relationship between Socio-personal & Psychological characteristic and e-learning readiness:
The results obtained in respect of relationship between independent variables with dependent variable are presented in following table-5.

Table 5: Correlation analysis of socio-personal & psychological characteristics of teachers

Indicators Variables	TSR	OLR	IR	AR	HRR	ER	CR	FR	TER
Age	0.013	0.050	0.003	0.110	-0.131	-0.060	0.155	0.100	0.158
Gen	-0.242*	-0.098	0.053	0.041	-0.057	-0.177	0.127	-0.119	0.066
AI	-0.288*	0.085	0.092	0.409**	-0.399**	-0.472*	0.216	-0.101	0.456**
TE	-0.214	0.083	-0.025	0.219	-0.108	-0.127	0.271*	-0.077	0.265
EDU	0.272*	-0.064	0.143	-0.673**	0.786**	0.752**	-0.425**	0.101	-0.743**
CL	-0.333**	0.053	0.155	0.543**	-0.667**	-0.675**	0.489**	0.052	0.681**
Desig	0.432**	-0.113	-0.020	-0.815**	0.849**	0.845**	-0.589**	-0.012	-0.920**
AM	-0.373**	0.128	0.007	0.431**	-0.464**	-0.416**	0.223	-0.219	0.436**
FSP	0.495**	-0.136	-0.069	-0.738**	0.817**	0.804**	-0.540**	-0.024	-0.844**
PU	-0.251*	-0.222	-0.139	0.633**	-0.638**	-0.656**	0.483**	0.072	0.720**
PEOU	-0.188	0.076	-0.004	0.045	-0.261*	-0.308**	-0.075	-0.104	0.120
BI	0.458**	0.044	-0.070	-0.603**	0.645*	0.582**	-0.453**	-0.065	-0.675**
ATE	-0.196	0.113	-0.007	0.211	-0.311	-0.328**	0.010	-0.090	0.230

*(*significant at 0.01 level of probability,
** significant at 0.05 level of probability)*

TSR= Technological Skill Readiness, OLR=Online Learning Style Readiness, IR=Infrastructure Readiness, AR=Attitude Readiness, HRR=Human Resource Readiness, ER=Environmental Readiness, CR=Cultural Readiness, FR=Financial Readiness and TER=Total e-learning Readiness, Gen=gender, AI=Annual Income, TE=Teaching Experience, EDU=Educational Qualification, CL=Computer Literacy, Design=Designation, AM=Achievement motivation, FSP=Formal Social Participation, PU=Perceived Usefulness, PEOU=Perceived ease of use, BI=Behavioral intention, ATE=Attitude towards e-learning.

The data in the above table clearly reveals that educational qualification, designation, formal social participation and behavioral intention had negative co-relation with attitude readiness, cultural readiness and total e-learning readiness whereas, annual income, computer literacy, achievement motivation and perceived usefulness had positive and significant co-relation with attitude readiness and total e-learning readiness. Annual income, computer literacy, achievement motivation and perceived usefulness had negative co-relation with technological skill readiness and environmental readiness whereas educational qualification, designation, formal social participation and behavioral intention had positive co-relation with dependent variable technological skill readiness and environmental readiness. Teaching experience, computer literacy and perceived usefulness had positive and significant co-relation with cultural readiness. Annual income, computer literacy, formal social participation, perceived usefulness and perceived ease of use had negative co-relation with human resource readiness whereas educational qualification, designation, achievement motivation and behavioral intention had positive co-relation with human resource readiness. Gender had negative co-relation with technological skill readiness. Perceived ease of use and attitude towards e-learning had negative co-relation with environmental readiness.

Conclusion

E-Learning is the new form of technological advancement integrated in the education system to ensure quality, access and equity to education. It has a huge potential in bridging the gap created through digital divide. Research on faculty members' readiness of teaching with e-learning is important, because it can support the expansion of pedagogical practices for professors. The SAU in northern India was studied for e-learning readiness Assessment. The results of the present investigation reveals that it is ready but needs a few improvements. Trainings or workshops may be organized for improving technological skills of faculty members, trying to make their attitude positive towards innovations in educational technology, resetting the infrastructure of the organization and making human resource ready.

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