



## **CRITICAL E-LEARNING RECOGNITION FACTORS: AN EMPIRICAL RESEARCH OF STUDENT PERCEPTIONS IN NORTHEAST INDIA**

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**Abstract** – IT companies with the information era and tide of on-line education, it is necessary to explore learners'-learning recognition behaviors. By investigating critical factors on e-learning in Northeast (NE) India, our study attempts to probe the innate mechanism for individual e-learning intention with data collection place of Northeast India. Findings indicate that instructor characteristics and teaching resources are the predictors of the perceived usefulness of e-learning and perceived usefulness and joyfulness are the predictors of the e-learning recognition. While statistically significant, perceived adaptability was shown to have the weakest effect on the e-learning recognition among the predictors. All these results are very consistent with the previous studies conducted in other countries, proving the universal nature of the learners' perceptions and behavior towards e-learning. Managerial implications of the findings and future research directions are also discussed eventually.

**Keywords** --- e-Learning; Recognition; influencing factor; Northeast India

### I. INTRODUCTION

One of the most significant changes in modern education during the fast growing age is the trend shift from teacher-cantered to learner-centred education, while the emergence of electronic learning (e-learning) has further facilitated the process. Essentially, E-learning is the use of telecommunication technology to deliver information available to learners regardless of time restrictions or geographic proximity, and the learning environment is emerging as a new paradigm in education. Around the world e-learning has more and more drawn attention from educational institutions, software developers, and business organizations due to the potential educational benefits. Such benefits reduced education cost, consistency, timely content, flexible accessibility, and convenience (Kahiigi & M Vesisenaho, 2013; Kelly & Bauer, 2014). Nowadays in India, many educational institutions and social organizations are offering online degree programs or training courses, expanding their educational practice without time and space barriers. Business organizations and human resources sectors are increasingly replacing traditional offline job training with online training, for the latter one saves training costs and enhances learning effectiveness by delivering high-quality practical services. Objectively speaking, the success of e-learning in a larger part depends on the implementation of a feasible educational mode and operating mechanism which addresses the learners' actual needs. As the use of e-learning has increased, so has research into those factors affecting learners' attitudes toward e-learning. Although previous studies in the past few years have investigated the success factors under different task environments, there is still a lack of empirical studies that focus on the relationships among e-learning and learners' social recognition, especially in the context of transition economies and less developed countries. Thus, this research attempts to fill the gap in the specific Northeast India background.

The development of e-learning is strongly related to the rapid growth of its Information & Communication Technology industry as well as the administrative force. India is one of driving powers behind the stride of e-learning. High-quality e-learning services have been rapidly developed due to the infrastructure and high-speed Internet support. India's highly dense population and relatively high literacy rate provides cost-effective conditions for investments in e-learning. The high enrolment rate in colleges makes investments in e-learning cost-effective. Realizing the potential benefits of e-learning, companies in India are increasingly adopting e-learning technique to train their employees especially the newly introduced college students and improve their productivity (Al-Busaidi, 2012). However, the propelling trend is diversified in different geographical regions, as India is geographically imbalanced both in economic development and educational utilities. On the whole, western coast areas are more activated in promoting e-learning than eastern parts, and this meanwhile affects

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individual recognitions as learners set learning goals based on the contextual features of the environment.

Thus, the paper intends to investigate e-learning social recognition in Northeast India from student perspectives on exploring its adoption, and uncover those critical influencing factors within. Specifically, this paper is organized in the following sections: firstly, it begins with the literature overview on e-learning disclosure made by previous studies; secondly, it proposes the research hypotheses, following by a demonstration of the methodology. The statistical results will show in Section 4 and the discussions & conclusions will present in Section 5.

## II. LITERATURE REVIEW

### A. Acceptance of e-learning

The concept of e-learning has extended for a long period of time in academic fields but so far not been clearly agreed on. Generally e-learning refers to any kinds of the use of electronic devices for learning purpose, including the delivery of information or knowledge via electronic media such as computer network, audio (or video tape), satellite broadcast, interactive TV, and so on (Shee & Wang, 2008, Sun *et al.*, 2008). It is commonly accepted by more researchers that e-learning can be delivered by any electronic media paths other than web-based media. E-learning's characteristics fulfill the learning requirements in a modern society and have created great demand from business to institute of higher education. Nowadays, e-learning has become an indispensable part in the competitive educational services market. Owing to high social demands, educational service providers offer online lessons, online tests, and educational consulting to meet the diverse needs of the customers.

Modern e-learning is affiliated to active learning mode, which is often contrasted to the traditional lecture where students passively receive information from the instructor in gloaming atmosphere. Bouhnik & Marcus (2006) ever state advantages of e-learning: freedom to decide lessons choice, convenience to reduce learning time constrains, adaptability to express thoughts without limitations, and accessibility of courses materials. Actually, the time and space resilience is the main key element for the popular acceptance, as e-learning provides flexible conditions for media-based, student-cantered, and interactive environments that support active learning (Ellis & Goodyear, 2013; Alenezi, 2018). Even though the potential benefits of e-learning may be significant, there are also a number limitations and challenges to actual practices. On one side, e-learning generally requires a high upfront cost, new pedagogical skills, learners' self-discipline and motivation (Giesber *et al.*, 2013). Security issues such as cyber attacks and cyber virus to e-learning information systems are of great concern to the learners and service providers (Ben-Asher, 2013). Additionally, in administering online tests, authenticating test-takers is one of the major challenges due to the inability to directly monitor the exam takers. To enhance the assessment of learning performance, some educational service providers or higher education institutions offer a mixture of online tests and offline tests, which further push e-learning difficult to acquire its actual effects.

Various studies have suggested perceived effectiveness is a critical factor to affecting learner attitudes toward e-learning (Kramarski & Gutman, 2006), while the degrees of learner satisfaction have been commonly used to evaluate the acceptance of e-learning (Eom, *et al.*, 2006; Levy, 2007). Roca *et al.* (2006) applied the Technology-Acceptance Model (TAM) for investigating learner intention toward e-learning environments, and found that users' continuance intention is determined by satisfaction, which in turn is jointly determined by perceived usefulness, information quality, confirmation, service quality, system quality, perceived adaptability and cognitive absorption. More recently, Levy (2008) investigated issues related to learners' perceived value by uncovering the critical value factors of online learning activities. His study identified five reliable CVFs that contribute to learners' perceived value: (a) collaborative, social, and passive learning activities; (b) formal communication activities; (c) formal learning activities; (d) logistic activities; and (e) printing activities.

### B. Recognition Factor

Despite the potential of e-learning serves as a tool to enhance education and training performance, its value will not be realized if users do not accept it as a learning tool. When designing an e-learning course, instructors are faced with lots of considerations that consequently affect how student's desires construct and process external information. Indeed, students' recognitions of e-learning are positively related to perceived learning effects, which usually includes learning outcomes, individual achievements and course satisfaction (JL. Holmgren & S. Bolkan, 2014). Here, we apply certain constructs (perceived usefulness & perceived adaptability) to assess students' recognition of online course, and in fact results revealed that perceived usefulness and perceived adaptability proved to be key determinants of the recognition as an effective and

efficient learning channel. To understand an engineer's recognition of e-learning, Bouhnik *et al* (2006) proposed a construct, perceived credibility, which measures the degree to which a person believes that a particular system would be free of privacy and security threats. Their empirical study supports that perceived credibility has a positive effect on engineers'-learning recognition, thus here we also lead it to our research. Other factors are cited by the closeness and application ripeness, such as learner IT technology anxiety, instructor attitude toward e-learning, e-learning course flexibility, e-learning course quality, and diversity in assessments, which all also seem to affect learners' recognition satisfaction (Sun, Tsai, Finger, et al. 2008). Roca & Gagné (2008) introduced three motivational factors, perceived autonomy support, perceived competence, and perceived relatedness. Actually, to enhance e-learning effective outcomes, enhancing individual satisfaction is a necessity and ought to put the analysis framework. Fig. 1 presents some related elements based on previous studies.

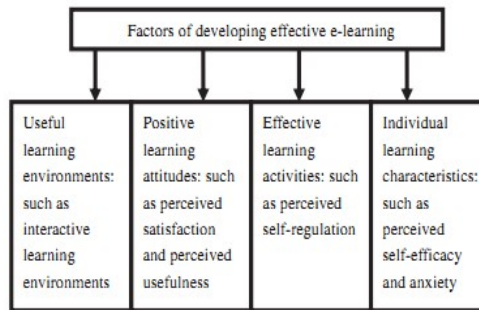


Fig. 1 Elements of developing effective e-learning environments (adapted from Liaw [2013]).

A few e-learning studies meanwhile address contribution of joyfulness to instructors' and learners' recognition of e-learning service. Pituch & Lee (2006) captured both extrinsic and intrinsic motivators for explaining students learning recognition services. Shee & Wang (2008) also advised four dimensions should be investigated when evaluating e-learning: user-friendly learner interface, interactive learning community, useful system content, and personalization. These results all showed that feeling factors to some degree impacted students e-learning recognition. On the other hand, perceived adaptability did not have a significant effect on student attitude or e-learning recognition. Our literature review reveals that further research is still needed to understand joyfulness and the adoption of e-learning.

### III. MODEL AND HYPOTHESIS

#### A. Model

Based on the literature review, we believe that e-learning comprehensive research is fast needed to assess the e-learning recognition by the current and future learners. We proposed a theoretic model which consists of both independent variables and dependent variable. The independent variables are joyfulness and e-learning service quality constructs, including instructor characteristics, teaching resources, and learning design. Instructor characteristics are defined as the extent to which instructors are helpful, and accommodating to students. Teaching resources are defined as the extent to which teaching materials are suitable for e-learning. Learning design is defined as the extent to which learning contents are adequately designed and developed to fit students' needs. Other two variables are perceived usefulness and perceived adaptability. Perceived usefulness is the degree to which a person believes that a particular e-learning service would enhance his/her learning performance and bring feasible benefits. Perceived adaptability is the degree to which a person believes that e-learning would be easy to acquire and smoothly make use. The dependent variable, also the key research intent, is the e-learning social recognition.

#### B. Hypotheses

Instructor's attitude and ability affect learners' attitude toward e-learning, and instructor's teaching style affects learners' enthusiasm participation, and attitude toward e-learning (Webster & Hackley, 1997; Wang, 2016). An empirical study on student attitude towards using e-learning reveals that instructor characteristics are the most critical factor in e-learning success, followed by IT infrastructure and university support (Selim, 2007). A recent study suggests that e-learning course quality affect

learners' perceived satisfaction (Sun et al., 2008). Based on the articulation above, we establish our hypothesizes as follows:

a. Hypothesis 1

From the abovementioned literature review, we can see instructor serves as one vital role in transmitting the e-learning value. Thus we proposed hypothesis I (H1): Instructor characteristics positively affect learners' perceived usefulness for e-learning.

b. Hypothesis 2

Learners will be more inclined to feel that using the e-learning services is easy if e-learning services are provided with plentiful contents designed to meet their needs. In the e-learning context, learner-centered services which provide learners with learning contents accurately and consistently will facilitate perceived e-learning use. Thus we make the following hypothesis:

Teaching resources positively affect learners' perceived usefulness in the e-learning context.

c. Hypothesis 3

In the e-learning context, researchers indicate that perceived adaptability affects usage directly and indirectly through perceived usefulness (Venkatesh & Davis, 2000), and the factor positively affects the system perceived usefulness (Pituch & Lee, 2006). Thus, we hypothesized the following:

Learning design positively affects learners' perceived adaptability in the e-learning context.

d. Hypothesis 4

Previous research suggests that the success of e-learning depend on continued usage (Chiu, Hsu, Sun, Lin, & Sun, 2005). Studies indicated perceived usefulness contribute to the learners' behavioral intention to use e-learning system (Liaw, 2008). Thus, we hypothesized the followings.

Learners' perceived adaptability positively affects learners' perceived usefulness.

e. Hypothesis 5

One goal is obvious that learners intend to acquire useful knowledge as well as scientific sources, thus a criteria for fit in e-learning is affiliated with actors perception in the learning process. Based on this, we get the following hypothesis:

Learners' perceived usefulness positively affects the intention to e-learning.

f. Hypothesis 6

On certain content, learning is a kind of game which learners not only acquire knowledge but also the innate satisfaction, especially in the web-based environment. Nowadays, more and more researchers as well as common masses hold the view that "learns for playing", that cyberspace learning provides an irreplaceable channel for modern leaning. Thus we make the following hypothesis:

E-learning's joyfulness positively affects the intention to e-learning.

## IV. METHODOLOGY

### A. Questionnaire

To test the hypotheses advanced in this study, we used a questionnaire survey research method to obtain responses from the sample students in Northeast India. As a first step in our research, a pilot study with online interviews was carried out, in which random college students from Northeastern India provinces described aspects of e-learning they consider important. By a content analysis, students' answers were categorized and the frequency of answers in all categories was determined.

Utilizing the feedback from the pilot study and considering the nature of samples, we further designed the questionnaire. The questionnaire contains (a) an evaluation of students' expectations of e-learning, (b) their feeling of e-learning experiences, (c) assessments of course outcomes (learning achievements, course satisfaction), and (d) demographic questions. In the first section, students evaluated the importance of e-learning on a six-point scale (ranging from 1 "not important at all" to 6 "very important"). In the second section, they are demanded to evaluate statements describing positive or negative e-learning experiences on similar scale (ranging from 1 "I disagree completely" to 6 "I agree completely"). In the third section, they are requested to assess their e-learning satisfaction (scale ranging from 1 "very low achievements/satisfaction" to 6 "very high achievements/satisfaction"). In other words, Scale items in questionnaire were all developed based on the existing literature discussed in the previous studies as well as pilot tests from the first procedure. The variables in the constructed research model also encompass in the items: instructor characteristics, teaching resources, learning design, joyfulness, perceived usefulness, perceived adaptability, and e-learning recognition.

Table 1 shows the operational definition of each variable mentioned.

### B. Data collection

For data collection, we dispatched interviewers to various high-level educational institutions as university, college and vocational schools during the period time of year 2018-19 in Northeast India Provinces. We briefed the interviewers on the key objectives of this study as well as background references. To enhance the quality of data collection process, we trained the interviewers on interview techniques, and also assured the key informants that their responses will be kept confidential. Clearly, these procedures minimized potential misinterpretation of questions and also enhanced data collection quality.

In total 373 students or learners who had attended at least one e-learning class participated in this study through an anonymous survey channel. Over 97% of the survey participants are in the age range of 18–30 years old. 12% of the survey participants are freshmen, 41% sophomores, 33% juniors, and 14% seniors. Of the 373 distributed questionnaires, 36 were not completed validly, and 29 were not returned, resulting in 308 valid responses (a response rate of 82.6%). Also, we collected students' final scores to examine the relationship between their perceptions of perceived support and e-learning outcomes.

Table 1. Variables and operation definition for e-learning model

Construct variable	Operation definition
instructor	the extent to which instructors are concerning to students
teaching resources	the extent to which teaching materials are suitable
learning design	the extent to which learning contents are better designed for learners
joyfulness	the extent to which students enjoy e-learning
perceived usefulness	the extent to which learners admit the economic utility
perceived adaptability	the extent to which learners believe that e-learning will be easy to
e-learning recognition	the extent to which learners intend to participate in learning

The courses selected for the study combined both e-learning and traditional face-to-face learning methods. Both synchronous and asynchronous web-based technologies were used for the e-learning support. The asynchronous e-learning support includes online lecture notes, online quizzes, online announcements, online assignments, electronic student-student & student-instructor communication, audio & video streaming. The synchronous e-learning support includes chat and video conferencing.

## V. DATA ANALYSIS

### A. Reliability and Validity Analysis

We use SPSS 18.0 to analyze the collected data. Given the theory-driven approach to scale development, scale validation was done using classic exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The factor analysis utilized the *principal component extraction* method and *Varimax rotation*. It required that factor loadings exceed 0.50. After factor analyzing one item from *Instructor Characteristics*, one item from *Knowledge Transmitting Resources*, and three items from *Learning Design* were deleted due to a low factor loading. While four items were removed from the three factors in the independent variables, no items were deleted from the two belief variables and the dependent variable. The high reliability of these variables can be attributed to the fact that numerous previous studies validated the factor items.

The questionnaire used the classic *Cronbach's a* coefficient to test the internal consistency among items of the same construct. According to Cuieford (1965), a *Cronbach's a* value that is greater than 0.7 indicates high reliability and less than 0.35 represents unacceptable reliability. A *Cronbach's a* value between 0.35 and 0.7 has fair but acceptable reliability. Researchers suggest *Cronbach alpha* of 0.70 for confirmatory research and 0.60 for exploratory research as acceptable (Hair, Anderson & Black, 1998). The reliability values of the constructs are in the range of 0.692–0.889 suggesting acceptable reliability.

Cumulative variance explained for all the variables are measured to be acceptable, namely, 59.73% for the independent variables; 80.79% for the belief variables; and 70.21% for the dependent variable. The factor loading values of all indicator variables are over 0.512, far exceeding 0.30, which is considered the minimum loading for interpretability. Overall, all these results suggest that the constructs exhibit appropriate psychometric properties and our model fits well with the data.

### B. Hypotheses testing

Although structural equation modeling (SEM) has advantages over traditional statistical techniques such as regression, it is recommended that for a model with two to four factors, an investigator plan on collecting at least 100 cases, with 200 being better. Due to the smaller sample size than recommended for SEM, a regression

model is used for testing the hypotheses. Table 2 summarizes the test results.

Table 2. Data test results

Relations between variables	B	t-value	P-value
Instructor characteristics→Perceived	0.721	6.908	0.000**
Learning design → Perceived adaptability	0.322	4.119	0.000**
Perceived adaptability→ Perceived usefulness	0.573	6.252	0.000**
Perceived usefulness→ e-learning recognition	0.557	12.179	0.000**
Perceived adaptability→ e-learning	0.173	2.952	0.019*
Playfulness	0.558	10.279	0.000**

Note: \* $p < 0.05$ , \*\* $p < 0.001$

To test whether there is an increment in the proportion of variance accounted for by model modification, we also used F-test and examined the significance of the change in the square of the multiple correlation coefficients. Results shows  $\Delta R^2$  is 0.017 ( $p < 0.01$ ), and the  $R^2$  value increase from model transaction is 0.035 ( $p < 0.001$ ). Totally, in all cases, the  $\Delta R^2$  were significant, indicating improvements in overall model fit as we added additional variables in the hierarchical regression models.

## VI. DISCUSSION

Focusing on indigenous e-learning in emerging economy settings such as that of India, we developed a theoretical framework to explain what factors will facilitate e-learning process in the internal control mechanisms, and empirically tested the established model using data obtained from Indian educational institutions.

In the empirical study, we analyzed learners' recognition of e-learning from on-the-training student perspectives in the context of Northeast India. The results indicate that as the comprehensive quality of e-learning as well as online education improves, the learners tend to be more positive towards e-learning. Actually, as modern internet technologies advance, e-learning service providers can enhance e-learning products without additional costs by taking advantage of the declining cost of technologies, thus resulting in greater adoption by e-learners. Among the variables, perceived usefulness is the greatest predictor of e-learning recognition. The result indicates that perceived usefulness in turn has a positive effect on e-learning recognition. Additionally, the usefulness can be enhanced by providing enhanced e-learning services without increasing the complexity of the e-learning process. Finally, joyfulness positively affects the e-learning recognition. One of the recent trends in educational services is to improve the educational outcomes by incorporating amusement. Educational institutions need to provide adequate resources to instructors and need to train them to use a variety of educational tools innovatively. Periodic survey and assessment of new entertainment tools for educational use seem worth conducting. Future research is needed to fully understand the relationships between student characteristics of different varieties and e-learning service quality constructs that improve or undermine learners' intention to use e-learning.

Besides its theoretic contributions to the literature, the results of this study have important implications for business practitioners. It provides social educational institutions with some guidance on how to use effective strategies to facilitate India's e-learning market. In emerging countries such as India, e-learning can act as "a big cake" and could help firms achieve potential profits. However, business sectors should also be aware that indigenous demands in India context is a complex side that needs effective "finding mechanism", and firms should better understand the innate social recognition in accepting e-learning.

Inevitably, there are several limitations in this study. First, there is reason to be cautious in generalizing from selected data in Northeast India to another site because of the context-specificity. More studies and closer examinations of contextual differences are necessary before generalizing these findings to other settings. Second, the cross-sectional data used in the study do not allow for causal interpretation among the factors. Ideally, this study would have benefited from a time lag between the measurement of the independent and dependent variables in order for causal relationships to be determined. We hope this study will serve as a foundation for future research in this area.

## VII. CONCLUSION

This study advances our understanding of e-learning and potential insights to practicing business sectors at a time when on-line course is assumed to be of great importance in the arena for company's training program.

Owing to the time and space barriers, learners in the traditional offline education are required to receive education at a certain time and location. On the contrary, the Internet-based e-learning is less restricted in terms of time and space. As e-learning is increasingly adopted by educational institutions and corporations, e-learning factors need to be evaluated and taken into consideration in the development of the e-learning systems to deliver the most effective services. Furthermore, educators also need appropriate supporting mechanisms for addressing technical issues and problems that students may

face in technology-enhanced e-learning environments. At the same time, India's dense student population and high educational standards make investments in e-learning very cost-effective. In the globalized era, understanding and investigating the country specific e-learning environment are of great importance.

Though we have done an empirical exploration upon e-learning recognition in the context of India, there still exist some unavoidable limits. Future research needs to include more influencing factors to build an integrated model. Furthermore, it needs to address the perceptions of students and corporate employees. As the world gets more globalized, understanding cross-cultural issues in e-learning will draw more attention, thus, cross-cultural e-learning studies may expose valuable new insights.

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