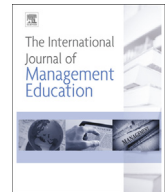


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Research Notes

The effect of electronic learning systems on the employee's commitment

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ABSTRACT

E-learning as a popular learning approach utilized by many organizations has become an important trend in recent years. It generally refers to the use of computer network technology, primarily over an intranet or through the Internet, to deliver information and instruction to individuals. It allows training to reach diverse and geographically dispersed workforces in a cost-efficient manner, and can take place on-demand and at a lesser cost than on-site training. Also, employee commitment is a dominant source of competitive advantage of many organizations and thus, has been drawn to its reported ability to solve intractable organizational challenges. Therefore, this study aimed to discuss the relationship between e-learning systems and employees commitment. The target samples of this study are the employees of the Islamic Azad University (the world's third largest university), Tabriz branch. For statistical analysis of questionnaires, we have used of the SMART-PLS 2.0 software package. Findings from the study confirmed the validity of the proposed model for employee's commitment assessment. In addition, the results showed that the four variables, learner's satisfaction, 24/7 access to training materials, personalized learning, and efficiency, significantly influenced employee's commitment.

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1. Introduction

The importance of the Internet as an information hub to facilitate data transfer and sharing has increased dramatically in the last decade because of its convenience in accessing both professional services and entertainment (Jafari Navimipour & Sharifi Milani, 2015). Integration of information and communication technology (ICT) into educational environments has made important contributions to learning processes. A key development in the use of ICT in higher education has been the increased use of the Internet and e-mail communications: in some instances, this has led to the adoption of virtual learning environments (Marriott, Marriott & Selwyn, 2004). In a knowledge and information society, e-learning has built on the extensive use of advanced information and communication technologies to deliver learning and instruction (Jafari Navimipour & Zareie, 2015a; 2015b). This technology has accelerated developments in e-learning environments and their individualization (Özyurt & Özyurt, 2015). Prior literature utilized e-learning as an umbrella term to describe teaching and learning activities using the information and communication technologies (Islam, 2016). Also, e-learning as a common use of internet and social networks utilizes electronic communication for learning and teaching from a distance (Zareie & Jafari

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Navimipour, 2016). Internet learning environment changed the way of people learning (Dahalan, Hassan & Atan, 2012). E-learning is a tool used to transfer the delivery, teaching or programs by means of electronic devices like computer, mobile phone, I-pads, tablets, and etc., as another word the institutions using e-learning courses will enlarge and enhance their combination of offering courses (Venkataraman & Sivakumar, 2015). E-learning is emerging as a popular learning approach utilized by many organizations (Jia, et al. 2011) and it is defined as a broad array of applications and processes that share a common feature of relying on some type of computer technology to promote learning (Bell & Federman, 2013). In addition, it can be defined as a way of learning in which teaching activities uses the Internet and digital contents for effective learning of students (Jafari Navimipour & Zareie, 2015a, 2015b). Recent research in e-learning has highlighted the need to define novel and advanced support mechanism for commercial and academic organizations in order to enhance the skills of employees and students to increase the overall competitiveness in the new economy world (Acampora, Gaeta & Loia, 2011).

Also, many organizations believe that employee commitment is a dominant source of competitive advantage and thus, has been drawn to its reported ability to solve intractable organizational challenges such as decreasing turnover rates and increasing productivity (Shuck, Reio & Rocco, 2011). The last two decades have witnessed the phase of transition from 'satisfied' employees to 'committed' employees who are not predisposed to attrition, rather immersed in the goal and success of their organization and often serve as the force behind organizational success. Employee engagement or employees commitment is often associated with other organization related concepts such as employees satisfaction (Kaliannan & Adjovu, 2015). Employee commitment practice is a broad term used by the human resources of an organization to actualize employee's performance and their commitment to the vision of the organization. It is believed that engagement is „one step up“ from commitment; it is clearly in the organization's interests to understand the drivers of engagement. It can be defined as the level of involvement an employee has towards their organization and its values. An organization's capacity to manage employee commitment is also reflected in business success (Singh & Shukla, 2012) and it improves company performance. Managers unequivocally agree that this century demands more efficiency and productivity than any other times in history. Employers now realize that by focusing on employee commitment, they can create more efficient and productive workforce (Kompaso & Sridevi, 2010) because employees are the important assets of organizations and play a significant role in their success (Navin, Navimipour, Rahmani & Hosseinzadeh, 2014; Navimipour, 2015; Navimipour, Rahmani, Navin & Hosseinzadeh, 2015a; 2015b). As e-learning has been expanding, however, so have debates about its effectiveness and concerns about its impact on the employee's commitment. Therefore, this study examines how to improve employee commitment using e-learning and the objectives of this study are as follows:

- Investigating the usefulness of e-learning for employees and increasing the employees' commitment;
- Highlighting the role of electronic learning in organizational success;
- Improving job performance through e-learning.

The paper proceeds as follows. In Section 2, we present the literature review. Section 3 presents the study design and hypothesis. Section 4 is dedicated to the research method. Section 5 presents the findings and discussion. Finally, conclusions are provided in Section 6.

2. Literature review

The Internet and web services as an information hub facilitate information and data transferring and sharing (Charband & Jafari Navimipour, 2016; Navimipour, Rahmani, Navin & Hosseinzadeh, 2015a; 2015b). Today's society emerged as a result of a transformation from an industrial era to a knowledge era, leaving room for the creation, collection, and use of knowledge (Gagnon, et al. 2015). The use of technology in education and organizations, commonly defined as e-learning, has become a standard component in many courses. Technology applications are not limited to the classroom – they are also placing some classroom sessions with virtual sessions or fully replacing classroom courses with online courses (Tîrziu & Vrabie, 2015). Distance learning and electronic learning has been a valuable alternative to classroom teaching for decades (Huang, Lin & Huang, 2012b). In the Canadian Council on Learning's recent report was stated that e-learning is “the development of knowledge and skills through the use of information and communication technologies (ICTs), particularly to support interactions for learning – interactions with content, with learning activities and tools, and with other people” (Tîrziu & Vrabie, 2015). Staff development and improving job status done through training is concerned as important parts of HRM in the third-millennium organizations (Fadaiyan, Reshadatjoo, Zahir & Golestanes, 2015) and their management is an important challenge in any system and organization (Ashourai, Jafari Navimipour, Ramage & Wong, 2015; Jafari Navimipour, Masoud Rahmani, Habibzad Navin & Hosseinzadeh, 2014). The development of a learning culture in an organization involves the continuous education of its members (Gagnon, et al. 2015). As learning professionals, we know the importance of learning on employee's commitment and turnover. Studies carried out by various researchers have highlighted the positive effect of training on various work-related outcomes for improving organizational performance and on the commitment level of employees (Dhar, 2015). Achieving employee commitment is essential (Lam, O'Donnell & Robertson, 2015) and the knowledge of the factors that influence employee's commitment in their electronic learning systems possibly provides teachers important information to design, develop, and finally distribute more effective distance learning courses. E-learning systems support the needs of the new workforce and drive employee's commitment in a number of ways:

- **Learners Satisfaction:** Numerous studies have found that the implementation of e-learning in its various forms can be expensive to an organization due to the relatively low adoption rate among users and this expenditure must be balanced with improved satisfaction (Cheok & Wong, 2015). According to previous studies on learner's satisfaction and the employee's commitment, technical characteristics of the learning system, educational content, and self-efficacy had a positive effect on learner's satisfaction (Hassanzadeh, Kanaani & Elahi, 2012; Ko & Ko, 2012; Rubin, Fernandes & Avgerinou, 2013; Roh, 2015). User satisfaction is defined as the sum of positive and negative responses to a set of factors (Najmul Islam, 2014). In addition, satisfaction is determined by users' subjective experience. An e-learning system can ensure effectiveness and efficiency but if users do not feel comfortable and emotionally positive in using it, the potential of the system wouldn't be fully taken advantage of (Grinberg & Hristova, 2012). Educational technology is the effective use of technological tools in learning. As a concept, it concerns an array of tools, such as media, machines and networking hardware's, as well as considering theoretical perspectives for their effective application (Richey, Silber & Ely, 2008). Education content is the quality of system output and measures semantic success (Hassanzadeh, Kanaani et al. 2012). Increased satisfaction leads to increased usage, reduced user complaints, and thus improved individual performance (Violante & Vezzetti, 2015) and employee's commitment.
- **24/7 Access to Training Materials:** E-learning is gaining an educational foothold all over the world. The availability of electronic and web-enabling technologies has a tremendous influence on the success of e-learning (Gunasekaran, McNeil & Shaul, 2002). "Anytime anywhere" access is always appropriate and valued. Clearly, the collapse of time-space barriers is a boon to multinational corporations who struggle to deliver consistent training to a workforce scattered across countries and time zones (Seow, Hughes & Servage, 2005). Educators can add and revise materials as business needs or trends change and employees may contribute to content themselves. It all adds up to continuous learning and an empowered workforce.
- **Personalized Learning:** The necessity of life-long learning in the era of knowledge explosion together with the ever-increasing bandwidth of Internet and continuously falling costs for memory bring about the rapid proliferation of massive open online courses (Lee, et al. 2014). People are looking for flexible learning to accommodate their needs for improvements. One option is through internet based learning or online learning. The Internet has provided people with unlimited access to information. Online learning enables lifelong learning to become more accessible (Dahalan, et al. 2012). Personalization is crucial to foster effective, active, efficient, and satisfactory learning, especially in informal learning scenarios that are being demanded in lifelong learning settings, with more control on the learner side and more sensitivity towards context (Henning, et al. 2014). Organizations can more easily tie learning goals to competencies, objectives, and priorities. Workforces have the flexibility to learn at their own pace and investigate other areas of interest easily.
- **Efficiency:** Efficient use of the e-learning system is related to the productivity, as work accomplished per unit time. For e-learning, a measure of efficiency would be the time or number of clicks trainees need to access a lesson or obtain some information, or the time needed to acquire some competence (Grinberg & Hristova, 2012). Employees are the backbone of an organization. Hence, the retention of the employees is important in keeping the organization on track (Hong, Hao, Kumar, Ramendran & Kadiresan, 2012). A highly engaged employee will consistently deliver beyond expectations. Thus, employee commitment is critical to any organization that seeks to retain valued employees (Singh & Shukla, 2012). Affective commitment and retention within nonprofit human service organizations are important factors of success in public policy implementation for those citizens in greatest need (Toscano, 2015). Employees take note of awareness and prefer employers who take active measures to reduce their footprint. Decreased materials usage leads to decrease the costs and increase employees' retention.

Summary of the variables identified by previous research can be seen in Table 1.

3. Study design and hypothesis

As in any data analytical activity, good experimental design and sampling are crucial to ensure representative and meaningful data. Under the four variables previously identified, nine indicators were involved. Fig. 1 illustrates the path

Table 1
Definitions of the variables.

Variables	Indicators	Advantage
Learners Satisfaction	<ul style="list-style-type: none"> • Technical characteristics of the learning system • Educational content 	<ul style="list-style-type: none"> • Creating a sense of enjoying from work • Increasing performance
24/7 Access to Training Materials	<ul style="list-style-type: none"> • Continuous learning • Empowered workforce 	<ul style="list-style-type: none"> • Access to unlimited information source • Access anytime and anywhere • Increasing knowledge sharing
Personalized Learning	<ul style="list-style-type: none"> • Flexibility of learning • Ease of learning 	<ul style="list-style-type: none"> • Improving employee creativity • Up-to-date employee knowledge
Efficiency	<ul style="list-style-type: none"> • Cost reduction • Employee retention • Consciousness 	<ul style="list-style-type: none"> • Increasing consciousness • Optimal use of workforce skills

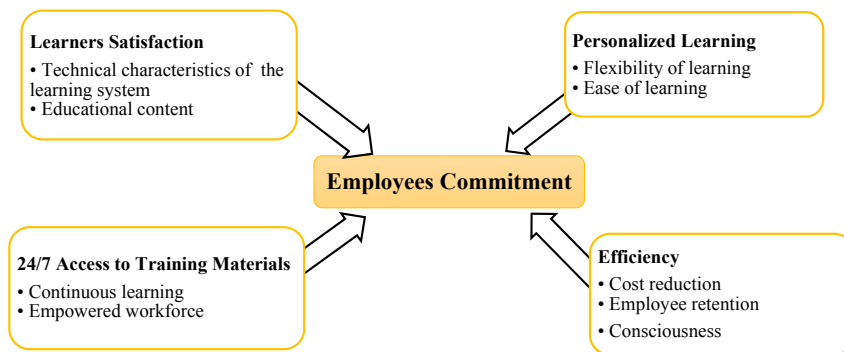


Fig. 1. The conceptual model.

diagram with the latent variables and the employed manifest variables. In the learner's satisfaction dimension, those indicators are technical characteristics of the learning system and educational content. The indicators of continuous learning and empowered workforce were identified in the 24/7 access to training materials dimension, and flexibility of learning and ease of learning in the personalized learning dimension. Finally, cost reduction, employee retention, and consciousness were identified in efficiency dimension.

Over the years, researchers in the fields of psychology, computer and organizations have paid attention to different subjects related to the workplace. These issues include job satisfaction, organizational commitment, organizational justice, and etc. (Ibrahim & Perez, 2014). Also, organizational literature has identified HR practices, such as training, recruitment, selection, and performance appraisal, as a support mechanism for employees to cope with organizational change. Therefore, HR practices are an organizational device through which a firm may induce the commitment of employees to the globalization of the firm (Yamao & Sekiguchi, 2015). These practices include offering opportunities for training as promotion criteria. This study asks if e-learning systems have an impact on employees' commitment to their workplace. Dhar (2015) and Bartlett and Kang (2004) further revealed that firms who are perceived to have fair accessibility to training programs are more likely to have a greater number of committed employees in their organization. Four hypotheses for testing the relationships among the dimensions of the framework are presented. The general and specific study hypotheses are as follows:

- H1.** : There is a significant positive relationship between learner's satisfaction and employee's commitment.
- H2.** : There is a significant positive relationship between 24/7 access to training materials and employee's commitment.
- H3.** : There is a significant positive relationship between personalized learning and employee's commitment.
- H4.** : There is a significant positive relationship between efficiency and employee's commitment.

Based on the presented assumptions and the possibility of a relationship between learner's satisfaction, 24/7 access to training materials, personalized learning, efficiency, and employee's commitment, we discussed the results in the future sections.

4. Methods

The design and implementation of e-learning (web-based education) systems have grown exponentially in the last years, motivated by the fact that neither students nor teachers are bound to a specific location (Hogo, 2010). E-learning can be defined as a distributed and Internet-based learning environment that utilizes educational tools to facilitate learning and knowledge building through meaningful action and interaction (Dabbagh, 2005). The objective of this research was to study the relationship between electronic learning systems and the employee's commitment. Data for this study was gathered via a questionnaire survey. The respondents indicated their agreement or disagreement with the above items using a five-point Likert scale (Likert, 1932) with 1 representing exceptionally agree and 5 representing exceptionally disagree. Questionnaires were revised with help from experts (including academics and practitioners) with significant experiences in e-learning. The target samples of this study are employees of the Islamic Azad University (the world's third largest university), Tabriz branch.¹ The Islamic Azad University (IAU) was founded in 1982 and it's headquartered in Tehran, Iran. Currently, 1.5 million students are enrolled. The IAU has more than 400 branches around the country and in other countries. The branches in other countries are located in the United Arab Emirates, Great Britain, Tanzania, Lebanon, Armenia, Malaysia, Canada, Afghanistan, and Tajikistan. Master and Ph.D. programs have been offered in many different branches of IAU. Tabriz branch of IAU as the first branch of it is located in Tabriz in the northwest of Iran. The university rankings conducted by Islamic World

¹ <http://www.iaut.ac.ir>.

Table 2

The convergent validity and reliability of measure for the measurement model.

Variables	AVE	Composite reliability	Cronbach's Alpha
Learners Satisfaction	0.69	0.92	0.87
24/7 Access to Training Materials	0.68	0.87	0.76
Personalized Learning	0.54	0.82	0.71
Efficiency	0.67	0.86	0.76
Employees Commitment	0.51	0.89	0.86

Science Citation Database, have gained in the years 2010 and 2011 ranked first among all Islamic Azad universities. It has more than 31,000 students and e-learning is the popular tools between its academic staff and students. Therefore, it can be a good choice for our study. The total volume of the sample was 340 person. According to Morgan table (Appendix A), the target population was selected. Thus, 181 cases were randomly selected. Overall, 175 usable questionnaires were returned.

For statistical analysis of questionnaires, we have used of the SPSS 22 and SMART- PLS 2.0 software package. PLS is a statistical approach for modeling complex multivariable relationships among observed and latent variables. In the past few years, this approach has been enjoying increasing popularity in several sciences. SEM (structural equation models) includes a number of statistical methodologies allowing the estimation of a causal theoretical network of relationships linking latent complex concepts, each measured by means of a number of observable indicators. From the standpoint of structural equation modeling, PLS is a component-based approach where the concept of causality is formulated in terms of linear conditional expectation (Vinzi, Chin, Henseler & Wang, 2010). PLS is a component-based approach that assesses construct reliability and validity and estimates the relationships among constructs (Wold & Joreskog, 1982). So, in this paper, Smart PLS 2.0 was used to assess the measurement. The measurement model was assessed using item loadings, convergent validity, the reliability of measure, and discriminant validity (AVE, Composite Reliability, and Cronbach's Alpha) (Jafari Navimipour & Soltani, 2016). Also, the structural model and research hypotheses were tested using PLS (the T-value, the R^2 values, and the GoF index). In the following, the results of the model testing will be presented.

5. Findings and discussion

The measurement model in PLS is assessed in terms of inter-construct correlations, item-to-construct correlations, Cronbach's alphas, composite reliabilities, and the average variance extracted for each construct (Ruiz, Gremler, Washburn & Carrión, 2010). An item was considered to be reliable if its loading was greater than 0.7. The convergent validity was assessed by using average variance extracted (AVE), which must exceed a standard minimum level of 0.5 (Fornell & Larcker, 1981). The reliability of the measures was examined through the use of composite reliability and Cronbach's alpha. In general, the minimum value of composite reliability is 0.7 (Nunnally, 1978), and the minimum value of Cronbach's alpha is 0.7 (Cronbach, 1951; Setbon & Raude, 2010). The discriminant validity was assessed using the square root of average variance extracted and latent variable correlations. The square root of average variance extracted of each construct should exceed the correlation shared between one construct and other constructs in the model (Huang, Huang, Huang & Lin, 2012a). Tables 2 and 3 show the results of the measurement model to be acceptable since all the values met the standard levels.

This study adopted the criteria evaluation measurement model suggested by Fornell and Larcker (1981): (1) the Cronbach's alpha should be significant and greater than 0.7; (2) the composite reliability (CR) should be greater than 0.7; (3) the average variance extracted (AVE) should be greater than 0.5. Table 3 presents every construct's AVE values and the square of the estimated correlations for each pair of constructs. This information confirms the existence of discriminant validity between the constructs since the AVE values are higher than the squared estimated correlations.

We wanted to test whether or not the e-learning system can provide improved results in employee's commitment. PLS statistical software was used to analyze the questionnaire results. Paired t-test results in Fig. 2 indicate that the e-learning system yields better employee's commitment. The statistically significant loadings are at the 99.9 percent significance level. The results demonstrate that the e-learning improved the effectiveness of employee learning. Using ordinary least squares as its estimation technique, PLS performs an iterative set of factor analyzes and applies the bootstrap approach to assess the significance (t values) of paths (Chin, Marcolin & Newsted, 2003). As can be seen in Fig 2, the built hypotheses were all positive and significant at $p < 0.01$ and $p < 0.001$. The standardized coefficient between learners satisfaction and employees commitment was 0.15 ($t = 3.76$). H1, which stated that learner's satisfaction had a positive influence on employee's commitment, was thus supported. Respondents' employees commitment correlated with 24/7 access to training materials significantly at $p < 0.01$ ($t = 3.19$), so H2 was supported as well. The path coefficient between personalized learning and employees commitment was 0.55 ($t = 13.32$). Therefore, hypothesis H3 was statistically accepted. Furthermore, the path coefficient between efficiency and employees commitment was 0.44 ($t = 18.32$), $p < 0.001$, which indicates that efficiency had a positive and significant influence on employees commitment.

The primary evaluation criteria for the structural model are the R^2 measures and the level and significance of the path coefficients (Hair, Ringle & Sarstedt, 2011). The R^2 measures the quality of the inner model and is calculated for each endogenous variable according to latent variables, which explain it (Stan & Saporta, 2010). According to the effect sizes defined for R^2 by Cohen (1977), these effects can be classified as large (R^2_{small} is 0.02; R^2_{medium} is 0.13; R^2_{large} is 0.26) (Wetzels,

Table 3
The discriminant validity for the measurement model.

Variables	Learners Satisfaction	24/7 Access to Training Materials	Personalized Learning	Efficiency	Employees Commitment
Learners Satisfaction	0.83				
24/7 Access to Training Materials	0.31	0.82			
Personalized Learning	0.30	0.41	0.73		
Efficiency	0.31	0.36	0.37	0.82	
Employees Commitment	0.49	0.54	0.70	0.70	0.71

Note: Bold diagonal numbers are the square roots of AVE.

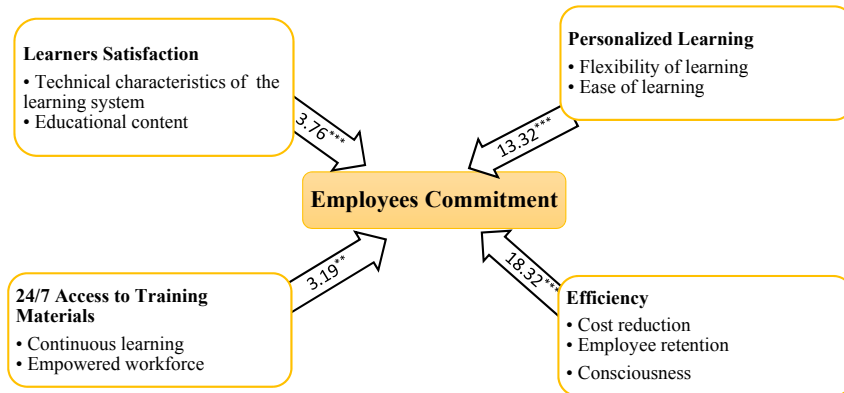


Fig. 2. T-test results. Not: **p < 0.01, ***p < 0.001.

Odekerken-Schröder & Van oppen, 2009). The transformation probability for the selected model was ($R^2 = 0.54$) indicated a good fit for the selected independent variables. Four path coefficients are also given in Fig. 3. The standardized path coefficients reveal the relative strength of the effect of each antecedent.

Recently, a global fit measure for PLS path modeling has been suggested, GOF ($0 < GOF < 1$), defined as the geometric mean of the average commonality and average R^2 value. $GOF_{small} = 0.1$, $GOF_{medium} = 0.25$, and $GOF_{large} = 0.36$; These may serve as baseline values for validating the PLS model globally (Wetzels, Odekerken-Schröder et al. 2009). The overall model was proven just acceptable with a good fit for data analysis via GOF index. Such an index has been developed in order to take into account the model performance in both the measurement and the structural model and thus provide a single measure for the overall prediction performance of the model. For this reason, the GOF index is obtained as the geometric mean of the average commonality index and the average R^2 value. The GOF index was calculated by formula:

$$GOF = \sqrt{AVE \times R^2} \tag{1}$$

Calculate the commonalities average and R^2 average value. The equation is shown in Eq. (2):

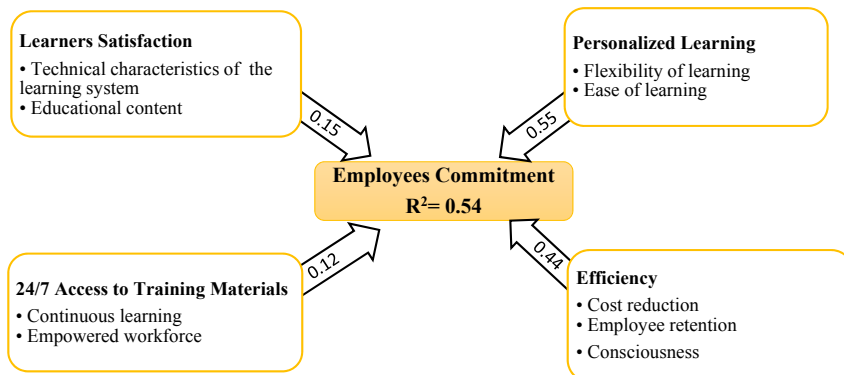


Fig. 3. Path results of the structural model.

$$\mu = \frac{1}{n} \cdot \sum_{i=1}^n X_i \quad (2)$$

The GOF value obtained:

$$\text{GOF} = \sqrt{0.60 \cdot 0.54} = 0.58$$

We obtained a GOF value of 0.58. Therefore, the structure of model had a good fit with the data.

6. Conclusions

Over the years, researchers in the fields of psychology, computer and organizations have paid attention to different subjects related the workplace. These issues include job satisfaction, organizational commitment, and organizational justice, etc. Many organizations believe that employee commitment is a dominant source of competitive advantage and thus, have been drawn to its reported ability to solve intractable organizational challenges such as decreasing turnover rates and increasing productivity. This study aimed to discuss the relationship between e-learning systems and employees' commitment. The target samples of this study are the employees of the Islamic Azad University (the world's third largest university), Tabriz branch. For statistical analysis of questionnaires, we have used the SMART- PLS 2.0 software package. We provide a model and framework for assessing the impact of e-learning on employee's commitment. The findings from this study demonstrate the importance of e-learning systems in employee's commitment. Four factors learner's satisfaction, 24/7 access to training materials, personalized learning, and efficiency have identified that influence on employees commitment.

This study found that the learner's satisfaction is important to the employee's commitment and has a positive and significant effect. Learner's satisfaction indicators included the technical characteristics of the learning system and educational content. The findings also show that 24/7 access to training materials is viewed as an important factor in e-learning satisfaction and employee's commitment. 24/7 access to training materials includes the indicators of continuous learning and empowered workforce. Furthermore, our research showed that the effect of the personalized learning (flexibility of learning, ease of learning) on employee's commitment is significant and positive. Another important finding is that efficiency is very important. The results indicated that efficiency has a positively and significantly influence on employee's commitment. Efficiency includes the indicators of cost reduction, employee retention, and consciousness. In addition, findings from the study confirmed the validity of the proposed model for employee's commitment assessment and an important practical implication of these findings is the possibility that employee's commitment and organization performance could be enhanced by e-learning systems.

This study has several limitations. First, the findings of this study are based and cross-sectional in nature. This makes it hard to establish that the relationships unearthed between the different factors are causal in nature. Therefore, it is recommended that further studies be carried out that are experimental as well as longitudinal in nature to conclusively establish the relationships unearthed in this study. Second, while the extant literature has argued that management support and employee commitment and training are key components of a continuous improvement project implementation and organizational performance little has been written about the specific management actions and implementation of e-learning systems that lead to success. As a future work, we plan to extend e-learning for employees' commitment as well as considering larger samples for conducting cross-validation of the model, so that generalizability can be ensured.

Appendix A

The Morgan table.

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10,000	373
65	56	210	136	480	214	1700	313	15,000	375
70	59	220	140	500	217	1800	317	20,000	377
75	63	230	144	550	225	1900	320	30,000	379
80	66	240	148	600	234	2000	322	40,000	380
85	70	250	152	650	242	2200	327	50,000	381

(continued on next page)

(continued)

N	S	N	S	N	S	N	S	N	S
90	73	260	155	700	248	2400	331	75,000	382
95	76	270	159	750	256	2600	335	100,000	384

Appendix B

Abbreviation table.

Abbreviation	Description
E-learning	Electronic learning
ELS	Electronic Learning Satisfaction
GOF	Goodness Of Fit
HRM	Human Resource Management
ICT	Information and Communication Technology
IT	Information Technology
LMS	Learning Management System
PLS	Partial Least Squares
SPSS	Statistical Package Social Sciences
SEM	Structural Equation Modeling

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