

Full Length Research Paper

Agricultural extension workers' attitude to and experience of e-learning

Amir Ahmadpour^{1*} and Shohreh Soltani²

¹Department of Agricultural Extension and Education, Sari Branch, Islamic Azad University, Sari, Iran.

²Department of Agricultural Extension and Education, Science and Research Branch, Islamic Azad University, Tehran, Iran.

Accepted 20 March, 2012

In many developing countries, e-learning is still regarded as an innovative mode of learning. Experience shows that transferring technologies can provoke the adoption of e-learning, only if people are willing and their attitude is positive for adoption. In fact, adoption of e-learning is related to the learners' attitude and prior experience of e-learning. In order to understand the attitude of extension workers to e-learning and their experience, this study was conveyed in Iran. From 2745 extension workers at line level in MoA, 379 were chosen on a random basis to fill in the questionnaires. Results showed that the extension workers' attitude to e-learning is generally positive and in most aspects relevant to the learners' prior experience. In order to improve the extension workers' attitude to e-learning, it is necessary to be aware of the results from prior experience. For those who do not have prior experience of e-learning, it is necessary to plan the new experience with more similarities to the traditional mode of learning.

Key words: E-learning, attitude, agricultural extension, extension workers.

INTRODUCTION

Recent technological advances and the trend toward flexible learning in education have led to the introduction of innovative modes of teaching and learning (Hannafin and Land, 1997). The new way of delivering teaching and learning is known as "online learning" or electronic learning (e-learning). E-learning refers to communication and learning activities through computers and networks (Tsai and Machado, 2002).

These advances in technology have changed virtually every aspect of our lives. Every day, businesses, program developers, staff developers, community-based agencies, professional associations, and universities are creating new courses, programs, services and other forms of technology-mediated learning. Faced with these opportunities, agencies are eager to explore the potential of e-learning and avoid whatever pitfalls may exist (National Staff Development Council, 2001).

In agriculture related fields, e-learning is still in the early phase of adoption and implementation (Ahmadpour et al., 2010a). The Ministry of Agriculture in Iran has considered the necessity of applying e-learning in agricultural extension network for training extension agents. Every year, extension agents are trained in different on-the-job training courses regularly. Holding such training courses in training centers requires considerable time and money because extension agents from different offices leave the office for training centers (Ahmadpour and Mirdamadi, 2010). Therefore, e-learning can be used to improve the effectiveness and efficiency of training in extension services (Hemmati and Sefidian, 2006).

The challenge for the education enterprise now is how to attract learners to their e-learning services (Liao and Lu, 2007). The learners' attitude towards e-learning influences their desire to take part in e-learning courses in agricultural extension (Ahmadpour et al., 2010b). As a result, this research was conveyed with the main aim of understanding the attitude to and experience of extension workers to e-learning. Other specific objectives of research were to:

*Corresponding author. E-mail: ahmadpour@iausari.ac.ir. Tel: +98 9125505546.

1. Understand the extension workers professional characteristics,
2. Explore the extension workers' experience of e-learning,
3. Determine the extension workers' attitude to e-learning, and
4. Analyze the relationship between the attitude to and experience of e-learning.

In this article, after introduction, in section 2, the conceptual framework is clarified. In this section, there is an explanation of e-learning and its application in extension organizations, attitudes to e-learning and the relationship between attitude to and experience of e-learning. In section 3, the research methodology is explained. After that in section 4 the results are clarified. Finally the discussion and conclusion is presented in section 5.

CONCEPTUAL FRAMEWORK

E-learning in extension organizations

E-learning as a modern mode of training can be used to improve the effectiveness and efficiency of training in extension services (Hemmati and Sefidian, 2006). Lippert and Plank (1999) emphasized on applying e-learning in agricultural extension. They noted that it is an effective, flexible delivery method that brings added benefit of being able to have experts and specialists from different regions and states in the same class without transportation and lodging costs and as such learners are receptive to using the internet and e-learning.

Several studies, including one by Lippert and Plank (1999) proved, that "the Internet can be an effective way to implement an in-service training within the US Cooperative Extension Service" (Lippert and Plank, 1999). But it is clear that the implementation of the e-learning system will depend on the level of readiness in terms of the budget, infrastructure and human resources such as experience, skills, knowledge and attitude (Rais and Hashim, 2004). Attitude to e-learning in agricultural extension is subsequently discussed.

Attitudes to e-learning and prior experience

Attitude is defined as an individual's positive or negative feeling (evaluative effect) about performing the target behaviour (Fishbein and Ajzen, 1975). The study of Ahmadpour and Mirdamadi (2010) showed that negative attitude of user towards e-learning is a barrier to developing e-learning in agricultural extension. Similarly, Dillon (1989) and Omid et al. (2008) found that negative attitude of organizations towards virtual education is a barrier to the development of e-learning programmes.

Therefore, learners' positive attitude to e-learning is very important if we are going to develop e-learning in agricultural extension. According to Ndubisi (2004), attitude is related to behavioral intention because people perform behaviors toward which they have positive feeling. Attitude towards e-learning model will be positively influenced by its perceived system's usefulness and ease of use. Learner attitudes and responses are interconnected and a positive correlation exists between the two (Paris, 2004). Shashaani (1994: 348) states that, "recent empirical studies have shown that computer experience is positively related to computer attitudes". According to Paechter et al. (2010), students' experiences in an e-learning course contributes to the achievement and satisfaction from courses.

E-learning requires self-directed, motivated, and independent learners with some competence and comfort in computer literacy and navigation. In addition, learners who have limited or no experience with e-learning may be reticent to jump in until they have confidence that they have the skills necessary to be successful (National Staff Development Council, 2001). E-learning technology adoption of learners with prior e-learning experience is different from those without prior e-learning experience. The study showed that those with prior experience have a stronger intention to adapt e-learning (Liao and Lu, 2007).

Students who have been involved in e-learning courses are generally very positive about their experiences. At the University of Wisconsin, 80% of the students who took a blended learning course indicated they thought the experience was worthwhile and that they would recommend a course offered in online format to others (Aycok et al., 2002).

Findings from Alexander and Golja (2007) revealed that learners' experiences warrant consideration in shaping future e-learning developments, and that students' value e-learning in facilitating their access to education for making choices about their learning.

Yaghoubi et al. (2011) studied the agricultural insurance agents' attitude towards e-learning. Results showed that attitude to e-learning are relatively positive. T-test result showed that there is a significant difference between the attitudes of people with experience in e-learning courses with those without experience. Similarly, Yaghoubi (2009) assessed agricultural extension and education graduate students' perceptions of e-learning in Iran. Results showed that students have positive perception to e-learning. The results also indicated that male students, students with previous knowledge of computers and students with positive attitudes to new technologies were all more positive in favor to e-learning than other students. There were significant relationship between computer and internet skills of students and their perceptions of e-learning.

Liaw (2008) investigated students' perceived satisfaction, behavioral intention, and effectiveness of e-learning. Results from this study confirmed the relationship between

Table 1. Summary of previous studies on the relationship between attitude to and experience of e-learning.

Author	Main finding
Alexander (2001)	The only feature of students which affect the success of e-learning is the experience of e-learning.
Aycock and Kaleta (2002)	Students who took a blended learning course indicated they would recommend a course offered in online format to others.
Ndubisi (2004)	Attitude towards e-learning model will be positively influenced by its perceived system's usefulness and ease of use.
National Staff Development Council (2001)	Learners who have limited or no experience with e-learning may be reticent to jump in until they have confidence that they have the skills necessary to be successful.
Alexander and Golja (2007)	Learners' experiences warrant consideration in shaping future e-learning developments.
Liaw (2008)	The study results confirmed the relationship between the prior experience of e-learning and the students' attitude towards e-learning. Perceived usefulness and perceived satisfaction both contribute to the learners' behavioral intention to use the e-learning system.
Yaghoubi (2009)	Male students, students with previous knowledge of computers and students with positive attitudes to new technologies were all more positive in favour to e-learning than other students. There were significant relationship between computer and internet skills of students and their perceptions of e-learning.
Yaghoubi et al. (2011)	T-test result showed that there is a significant difference between the attitudes of people with experience in e-learning courses with those without experience.

the prior experience of e-learning and the student's attitude toward e-learning. This research revealed that perceived usefulness and perceived satisfaction both contribute to the learners' behavioral intention to use the e-learning system.

On the importance of the learners' prior experience, Engelbrecht (2003) refers to Alexander (2001) who believed that successful e-learning takes place within a complex system involving the students' experience of learning, teachers' strategies, teachers' planning and thinking, and the teaching/learning context. According to this list, the only feature of students which affect the success of e-learning is the experience of e-learning. The main findings of the mentioned studies are summarized in Table 1.

METHODOLOGY

Research methods and instruments

In this quantitative study, questionnaire is used as the research instrument. Face validity of the research instrument was analyzed by experts of e-learning and

agricultural extension. For examining reliability of the research instrument, 30 questionnaires were filled by extension experts in Mazandaran province.

For each part of the questionnaire Alpha Cronbach coefficient was calculated separately. Based on the results of this test and the acquired coefficient, some questions were eliminated and some others were modified. In overall the reliability of questionnaire was more than 0.89 which is acceptable. Statistical population of the study consisted of 2745 extension workers at line level in Iran.

Based on the classification of the Ministry of Agriculture which has divided these centers into six regions, sample taking has been conducted using stratified proportionate random sampling technique. Sample size for the extension expert is 400 persons using Cochran formula. From 400 questionnaires, 379 questionnaires have been returned.

Variables and their measurement

General characteristics of extension workers include sex, age, work experience, management experience, major educational background, and general skills related to e-learning. Moreover, general skills related to e-learning included having ICDL certificate (Y/N), and using internet to access information related to their job (Y/N) included in general characteristics of extension workers.

In order to construct the variables for measuring attitude,

several previous studies were used including Wilkinson et al. (2010), Berteau (2009); Yaghoubi et al. (2011) and Liaw et al. (2007). In this research, attitude to e-learning in extension was investigated through ten questions that were measured using 5-point Likert scale (from 1: completely disagree to 5: completely agree).

Data was analyzed using SPSS 16 software. Chi-square, Mann-Whitney, and T-test was used to understand statistically significant differences between items. Research variables and their measurement are presented in Table 2.

RESULTS

Extension workers' general characteristics

Table 3 shows the general characteristics of extension workers. Ninety-three percent of the respondents were men and just 7% were women. The average of extension workers' age was about 40 years with the standard deviation of about 8 years. About 35% of extension workers had experience of management. The academic background of most of the extension workers (93.5%) was agriculture. About 57percent of the respondents had ICDL certificate and about 78 percent

Table 2. Main variables and their measurement.

Variable	Measurement	
General characteristics	Sex	Male /female
	Age	Years
	Work experience	Years
	Management experience	Y/N
	Major	(1) Agriculture (2) others
	Education level	(1) Technician (2) Bsc. (3) Msc.
	Extension experts' general skill related to e-learning	(1) ICDL skills certificate (Y/N) (2) Using internet to access information related to their job (Y/N)
Experience of e-learning	Y/N	
Attitude to e-learning in extension	e-learning provides new opportunities to access information	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	e-learning decreases costs of trainging	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	e-learning in comparison to traditional learning is a better method	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	The advantages of e-learning is more than its disadvantages	5-point Likert scale, from 1:completelydis agree to 5: completely disagree
	e-learning causes that people have equal opportunities for learning	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	e-learning is an appropriate method for extension workers to cope with their conditions limitiations	5-point Likert scale, from 1:completelydisagree to 5: completely disagree
	e-learning is a tool for raising participation in the learning process	5-point Likert scale, from 1:completelydisagree to 5: completely disagree
	e-learning leds to increasing in learning quality	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	e-learning is good and appropriate alternative for traditional learning methods	5-point Likert scale, from 1:completely disagree to 5: completely disagree
	e-learning has more effectiveness than traditional learning methods	5-point Likert scale, from 1:completely disagree to 5: completely disagree

Table 3. Descriptive statistics of general characteristics extension experts.

Variables	Female (7%)	Male (93%)
Sex		
Age/year	Mean = 39.66	SD = 7.65
Work experience/year	Mean = 15.39	SD = 8.14
Management experience	Yes (35%)	No (65%)
Academic background	Agriculture (93.5%)	Others (6.5%)
Education	Technician :22.4%	BSc. and higher: 77.6%
Extension experts' skill related to e-learning	ICDL certificate	56.5% Yes
	Using internet	78.1% Yes

used internet to access the needed information in their job. About 57.5% of respondents had ICDL certificate and

about 78% usually used internet to access their needed information.

Table 4. Extension workers' attitude to e-learning.

Attitude to e-learning	M.*	SD.	CV.	R.
e-learning provides new opportunities to access information	4.12	0.767	0.186	1
e-learning decreases costs of training	4.03	0.841	0.209	2
e-learning in comparison to traditional learning is a better method	3.91	0.859	0.220	3
The advantages of e-learning is more than its disadvantages	3.84	0.849	0.221	4
e-learning causes that people have equal opportunities for learning	3.78	0.894	0.236	5
e-learning is an appropriate method for extension workers to cope with their conditions limitations	3.60	0.868	0.241	6
e-learning is a tool for raising participation	3.84	0.938	0.244	7
e-learning increases the learning quality	3.66	0.901	0.245	8
e-learning is an appropriate alternative for traditional methods	3.51	1.035	0.295	9
e-learning is more effective comparing traditional learning methods	3.35	1.069	0.319	10
Total	3.76			

*M.: Mean, SD.: Std. Deviation, CV: Coefficient of Variation, R.: Rank.

Table 5. Extension workers prior experience of e-learning.

Personal character	Experience of e-learning		Differences	Sig.	
	Yes	No			
Sex	Male	164	174	Chi ² =3.609	0.729
	Female	19	11		
Education	Technician	32	54	Chi ² =19.57	0.021
	Bsc.	127	117		
	Msc.	20	12		
Academic background	Agriculture	175	168	Chi ² =4.634	0.865
	Non-Agriculture	7	14		
ICDL certificate	Yes	125	60	Chi ² =13.584	0.035
	No	95	93		
Using internet	Yes	171	116	Chi ² =50.42	0.000
	No	14	72		
Average of age		40.88	44.04	T = -1.511	0.132
Average of working experience		16.41	21.08	T = -2.581	0.010

Extension workers attitude to e-learning

Table 4 provides information on the extension workers attitude to e-learning. The attitude was investigated through 10 questions about different aspects of e-learning and respondents were asked to choose between 5-point likert options to declare their attitude towards each. As shown in Table 4, respondents' attitude to e-learning was generally positive (Total mean: 3.76).

According to the coefficients of variation, 10 items were ranked from 1 to 10. The first sentence on which respondents has the most positive attitude is that "e-learning provides new opportunities to access information" (Mean: 4.12, C.V: 0.186).

The item which is ranked as 10th is "e-learning having more effectiveness than traditional learning methods". Still, the mean is above average (Mean: 3.35, C.V: 0.319).

Extension workers prior experience of e-learning

Generally, 186 respondents (49.46%) had the experience of e-learning. In this study, the relationship between general characteristics of respondents and their prior experience of e-learning is investigated. Results are presented in Table 5.

As shown in Table 6, there is a significant difference between the educational level of those who had prior

Table 6. Extension workers' attitude to and experience of e-learning.

Mean of the attitude to e-learning	Experience of e-learning		Mann-Whitney	
	Yes/no: 186	No/no: 190	Z	Sig.
e-learning provides new opportunities to access information	4.22	4.03	-2.363	0.018
e-learning decreases costs of training	4.11	3.97	-2.006	0.045
e-learning in comparison to traditional learning is a better method	3.54	3.27	-2.560	0.010
The advantages of e-learning is more than its disadvantages	3.19	3.68	-3.887	0.000
e-learning causes that people have equal opportunities for learning	3.86	3.77	-1.196	0.232
e-learning is an appropriate method for extension workers to cope with their conditions limitations	3.73	3.55	-2.163	0.031
e-learning is a tool for raising participation in the learning process	3.88	3.87	-0.107	0.915
e-learning increases in learning quality	3.81	3.62	-2.194	0.028
e-learning is good and appropriate alternative for traditional learning methods	3.59	3.52	-0.713	0.476
e-learning has more effectiveness than traditional learning methods	4.06	3.83	-2.625	0.009

experience of e-learning and those who did not. The perceived frequency of respondents with BSc. level of education who had prior experience of e-learning is more than its expected frequency, while very few technicians had prior experience of e-learning.

A bigger group of respondents who had ICDL certificate had prior experience of e-learning in comparison to those who did not have (125 vs. 60 people). Moreover, a bigger group of those people who used internet to access information had prior experience of e-learning.

There is a significant difference between the average years of working experience of those who had prior experience of e-learning and those who did not. The group which had prior experience of e-learning (16.41 years) had significantly lesser experience than those (21.08 years) who did not.

The relationship between extension workers attitude to and experience of e-learning

Generally the group, who had prior experience of e-learning, had a more positive attitude to e-learning. In order to understand the relationship between each item of attitude and the prior experience of e-learning, Mann-Whitney U test was run. According to the results, 7 items from the total of 10 items have significant differences among two groups who had prior experience of e-learning and did not have. In the item, "e-learning provides new opportunities to access information", the mean of attitude of extension workers who had previous experience of e-learning is significantly higher than those extension workers without previous experience (4.22 vs. 4.02) with the 95% of confidence (Sig: 0.018).

Extension workers, who had prior experience of e-learning, are significantly more positive about the item "e-learning decreased costs of training" (Sig: 0.045).

For extension workers who had previous experience of e-learning, mean of attitude is higher for item "e-learning

in comparison to traditional learning which is a better method", with 99% level of confidence (Sig: 0.010). Those respondents, who did not have prior experience of e-learning, are more positive that "The advantages of e-learning are more than its disadvantages". This is the only item that the attitude of the group who did not have prior experience of e-learning has been more positive and significantly different (Sig: 0.000).

In the item "e-learning is an appropriate method for extension workers to cope with their conditions of limitations", the mean of attitude of extension workers who had previous experience of e-learning is significantly higher than those extension workers without previous experience with 95% of confidence (Sig: 0.031).

The mean of attitude of the extension workers who had previous experience of e-learning is significantly higher than that of the extension workers who did not have (Sig: 0.028). The attitude towards the higher effectiveness of e-learning in comparison to traditional learning methods is significantly more positive for the group of respondents who had previous experience of e-learning (sig: 0.009).

DISCUSSION

This study showed that extension workers' attitude towards e-learning is generally positive. Among other items, extension workers are very positive that e-learning provides new opportunities to access information. The strong positive attitude towards e-learning is an opportunity to develop e-learning system in agricultural extension. The prior experience of e-learning was investigated to understand the relationship between attitude to and experience of e-learning. Generally the group, who had prior experience of e-learning, had a more positive attitude to e-learning. The result is in accordance with Yaghoubi et al. (2011) and Liaw (2008). This showed that prior e-learning programs have been successful in building favorable attitude towards e-learning. For those

who do not have prior experience of e-learning, it is necessary to plan the new experience with more similarities to the traditional mode of learning, such that it can build a positive attitude for learners. This positive attitude will facilitate the development of e-learning programmes.

About half of the respondents had prior experience of e-learning. Most of the respondents who experienced e-learning had Bsc. and very few were technicians. The discussable fact here is that the group of extension workers who are in direct contact with farmers are technicians who work at line level but unfortunately have less opportunity to experience e-learning. The equipment and managers' desire for developing e-learning in the line level is not sufficient. Therefore, we suggest developing e-learning schemes and equipments at the line level as well.

A bigger group of respondents who had ICDL certificate had prior experience of e-learning in comparison to those who did not. Moreover, a bigger group of those people who used internet to access information had prior experience of e-learning. Yaghoubi et al. (2011) found the same result. According to Ahmadvpour et al. (2010b), knowledge and skills have a direct impact on using e-learning. Therefore, they suggest that the Ministry of Agriculture improve ICT knowledge and skills of extension agents.

There is a significant difference between the average years of working experience of those who had prior experience of e-learning and those who did not. The group which had prior experience of e-learning had significantly less experience than those who did not have (about 16 years). Therefore, extension workers who are fresh are faster adopters of e-learning. The program on e-learning should take the specifications and needs of this group of extension workers into consideration.

REFERENCES

- Ahmadvpour A, Mirdamadi M (2010). Determining Challenges in the Application of E-Learning in Agricultural Extension Services in Iran. *American-Eurasian J. Agric. Environ. Sci.*, 9(3): 292-296.
- Ahmadvpour A, Mirdamadi M, Hosseini J. F, Chizari M (2010 a). Factors Influencing the Design of Electronic learning system in Agricultural Extension. *Am. J. Agri. Biol. Sci.*, 5(2): 122-127.
- Ahmadvpour A, Mirdamadi M, Hosseini JF, Chizari M (2010b). Factors Affecting the Development of Electronic Learning in Agricultural Extension Network in Iran. *Middle-East J. Sci. Res.*, 5(4): 261-267
- Ajzen I, Fishbein M (1975). *Understanding attitudes and predicting social behaviour*. New Jersey; Prentice-Hall.
- Alexander S, Golja T (2007). Using Students' Experiences to Derive Quality in an e-Learning System: An Institution's Perspective. *Educ. Tech. Soc.*, 10(2): 17-33.
- Alexander S (2001). E-learning developments and experiences. *Educ Train.*, 43(4-5): 240-248.
- Aycock A, Garnham C, Kaleta R (2002). Lessons learned from the hybrid course project. *Teaching with Technology Today*. 8(6). Retrieved December 14, 2007, from <http://www.uwsa.edu/ttt/articles/garnham2.htm>
- Bertea P (2009). Measuring students' attitude towards e-Learning. A case study. The 5th International Scientific Conference, Bucharest, Romania.
- Dillon C (1989). Faculty rewards and instructional telecommunications: A view from the telecourse faculty. *Am. J. Dis. Edu.*, 3(2): 35-43.
- Engelbrecht E (2003). A look at e-learning models: investigating their value for developing an e-learning strategy, Bureau for Learning Development, *Unisa Progress.*, 25(2): 38-47.
- Hannafin M, Hill J, Land S (1997). StLident centered learning and interactive multimedia: StatuLs, issues, and implication. *Contemp Educ.*, 68(2): 94-99.
- Hemmati A, Sefidian E (2006). E-learning and investigation on its application in on-the job training for the staff of AREO. *Proceeding of the Iranian Agricultural Education Seminar*, Nov. 1-2, Tarbiat Modares University, Iran, pp. 221-232.
- Liao H, Lu H (2008). The role of experience and innovation characteristics in the adoption and continued use of e-learning websites. *Comput. Educ.*, 51: 1405-1416.
- Liaw S (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Comput Educ.*, 51: 864-873.
- Liaw S, Huang H, Chen G (2007). An activity-theoretical approach to investigate learners' factors toward e-learning systems. *Comput. Hum. Behav.*, 23: 1906-1920.
- Lippert R, Plank C (1999). Response to a first time use of internet in service training by agricultural extension agents. *J. Nat. Resour. Life Sci. Educ.*, 28: 53-56.
- Muhammad R, Hashim Y (2004). The Experience of the E-Learning Implementation at the Universiti Pendidikan Sultan Idris. *Malaysian Online J. Instru. Technolo.*, (MOJIT) August 2004.
- National Staff Development Council (2001). E-learning for educators: implementing the standards for staff development, Retrieved from web: <http://www.nsd.org/news/authors/e-learning.pdf>
- Ndubisi N (2004). Factors influencing e-learning adoption intention: Examining the determinant structure of the decomposed theory of planned behaviour constructs, University Malaysia Sabah, F.T. Labuan, Malaysia.
- Omidi Najafabadi M, Farajollah Hosseini J, Mirdamadi M, Moghadasi R (2008). Designing an Efficient Information and Communication Technology (Ict) System to Train Private Agricultural Insurance Brokers in Iran. *Australian J. Basic Appl. Sci.*, 2(4): 1041-1051.
- Paechter M, Maier B, Macher D (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Comput. Educ.*, 54:222-229.
- Paris P (2004). E-Learning: A study on Secondary Students' Attitudes towards Online Web Assisted Learning. *Int. Educ. J.*, 5(1): 98-112.
- Shashaani L (1994). Gender-differences in computer experience and its influence on computer attitudes. *J. Educ. Comput. Res.*, 11(4): 347-367.
- Tsai S, Machado P (2002). E-learning, online learning, web-based learning, or distance learning: Unveiling the ambiguity in current terminology. http://www.elearnmag.org/subpage.cfm?section=best_practices&article=6-1
- Wilkinson A, Roberts J, While A.E (2010). Construction of an instrument to measure student information and communication technology skills, experience and attitudes to e-learning. *Comput Hum. Behav.*, 26: 1369-1376.
- Yaghoubi j (2009). Assessment of agricultural extension and education graduate students' perceptions of e-learning in Iran. *Procedia Soc. Behav. Sci.*, 1(1): 1914-1918.
- Yaghoubi J, Shokri ME, Gholiniya M (2011). Assessing agricultural insurance agents attitude towards e-learning application in teaching them, *Procedia – Soc. Behav Sci.*, 15: 2923-2926.