

## The effect of E-learning method via learning path on psychology course learning in nursing students and comparing it with the lecturing method

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### Abstract

*In electronic learning systems, given the personality differences of individuals, a single constant method of instruction to educate all of the learners would not be appropriate. Therefore, development of such electronic systems with a personal-based learning mechanism is felt. The present research was then conducted with the purpose of studying the effect of E-learning method via learning path on learning and comparing it with the lecturing method. This is a quasi-experimental study which was performed in Shiraz University of Medical Sciences in 2018. The statistical population, included all B.Sc. nursing students who had elected the course of psychology (41 persons). The content of the course in the first 8 weeks of the semester was presented in the form of a lecture and in the second 8 weeks, it was presented through E-learning. Pre- and post-tests were given before and after each method. The results of independent t-test indicated that the average of score difference pre- and post-test in learning path method was significantly higher than in the lecturing method. Given the efficiency of learning path in improving knowledge and also the increasing use of this learning method in medical sciences, it can be certainly used in instructing some university courses.*

**Keywords:** Learning; E-course; Lecture; Learning path

### 1. Introduction

The growing development of information and communication technology has so far had a great influence on all fields and aspects of human life. One of these positive impacts is the new face of education and learning (Konia, M.R 2017). This technology has created a revolution in the field of education to the extent that it has been turned into learning.

One of the novel methods based on the information and communication technology is electronic learning (E-learning) emphasizing the learner's self-centeredness, self-management, and self-learning (Hashemi, 2012). This type of education is considered as a balanced and learner-based environment that makes possible easy learning by using different types of educational sources in different digital forms anytime and anywhere for every individual (Nkasiobi, et al 2012).

Many studies have shown that this type of training might help to learn and remember better (Keppel, 2009). Muninday and Dasamy have stated that using E-training content in form of multimedia might promote style, technique, method and quality of learning and increases active learning motivation (Mohamad. R et al, 2010). Based on research made by Ghasemi et al., using E-learning courses properly facilitates the expansion of scientific content and increases in-depth learning, due to flexibility of educational system (Baniyaghoobi. F, et al 2014). Also, E-learning

has been introduced by Segard et al. as an effective tool to obtain knowledge (Montassier. L, et al 2016).

Nevertheless, E-learning has some limitations, as well. For instance, the learner cannot make contact with other classmates and solve probable problems accordingly. This can demotivate some learners (Lahti M, et al (2014)). The learning management system is one of the web-based systems in E-learning that can eliminate the above-mentioned problems. This system is a software package automatically managing and controlling the instruction process and the human resources involved (AL-Busaidi K, et al 2012). This system also possesses some capabilities, including presentation of educational content in different formats, automatic management of learning process, presentation of electronic tests, and reporting all performed activities (Ming chen ,2008). In this environment, the learner is active and undertakes the greater part of instruction. In addition, there is a mutual interaction among the learner and instructor and other learners with the use of such tools as forum and FAQ sections (Behrangi M, et al 2016).

In spite of that, in order for such E-learning systems to succeed, a route is needed where the learner can accomplish learning with the least support of the instructor and via self-centeredness; for there is no single route for every learner ((Sheikh Abu Masoudi, R etal 2015).

The learning path has highlighted this issue and focused on E-learning systems with personal mechanisms. The learning path consists of a wide spectrum of learning topics and let the individual constantly produce knowledge, and the role of control is transferred from the instructor to the learner (Lin CF, et al 2013). The purpose of generating a learning route in online systems is to provide the learner with the most suitable learning solution compatible with the latter's characteristics. Imagine two students who are both interested in learning neurological diseases. One is acquainted with brain anatomy and the other has no information. Ultimately, both will learn about neurological diseases, but quite in different ways. Considering the previously-obtained information on the concept of anatomy, the first student would acquire that knowledge sooner than the second one (Smith.D et al, 2016). The outcome of such education is that people will reach their own learning goals sooner and adjust their learning route with their background knowledge. Therefore, the learners' extra cognitive burden and confusion decrease (Muhammad, A et al, 2016).

Finally, it is worth mentioning that the concept of education in the present era has been known as a factor for change and social development. And given the fast changes in the world of technology, instructors are forced to contemplate on novel methods of instruction and learning (Li Y, et al, 2008). Meanwhile, the field of medicine is not an exception. This rule is of great importance to nursing communities as a large part of this field of study. Because, the relation between education and nursing is constantly growing and the nurses' learning enhancement in academia will guarantee their position in working environment. ( Heravi M, et al ,2004)

Given the importance of instruction in the general education system and since that instructing all people efficiently would not be possible with a single method in a single place at a single time, further studies on the selection of optimal instructing methods is of great necessity. Since the contents of the course of psychology have separate identities so that a transposition in the presentation of each material does not affect the quality of other study materials, the present research was conducted with the purpose of studying the effect of E-learning method on learning the course of psychology in nursing students of Shiraz University of Medical Sciences and also comparing it with the lecturing method.

## **2. Methodology**

This is a quasi-experimental study with a single group design before and after crossover training in which researchers studied the effect of independent variable of learning methods on learning as a dependent variable in 41 nursing students at Shiraz University of Medical Sciences in their first semester (October 2018), in terms of social psychology curriculum.

### **2.1. Participation**

All nursing students enrolled in October 2017 semester and taking psychology were selected as sample size through purposive sampling and census method.

## **2.2. Work Method**

Work method in the research was divided into three parts: designing Electronic and lecture courses, preparing content and constructing electronic content, as well as execution.

### **2.2.1. Designing Lecture and E-courses**

Research period was programmed for 16 sessions (2 hours each). Based on social psychology curriculum it was divided into 8 sessions for lecture (first 8 sessions) and 8 sessions for E-training via path (second 8 sessions). Before the semester commencement, following topics were determined as appropriate for social psychology curriculum: psychology definition and history; psychology schools of thought; Bio Basics of behavior; individual differences; human mental needs; motivation and excitement; sensation and comprehension; aggressiveness; personality; conflict and failure; intelligence and tests; learning; memory and thought; family; love and fondness; and social anomaly.

To specify topics related to lecture method of training and E-training method of learning path, difficulty level of topics presented in psychology curriculum were reviewed through a five point Likert scale questionnaire filled out by the students who had passed the curriculum previously. Curriculum layouts in both halves of the semester was decided to be the same level of difficulty.

Topics presented in lecture method were: psychology definition and history; psychology schools of thought; Bio Basics of behavior; individual differences; human mental needs; motivation and excitement; sensation and comprehension; aggressiveness. Following topics were selected for E-course learning path: personality; conflict and failure; intelligence and tests; learning; memory and thought; family; love and fondness; and social anomaly.

### **2.2.2. Preparation and Development of Electronic Content (E-Content)**

To develop the electronic content, the training content was prepared from credible references developed in the PowerPoint Slides based on the standards of Virtual Faculty, the Advanced Electronic Training Scientific Centre of Shiraz University of Medical Sciences. The sound was recorded in the sound recording room of the Advanced Electronic Training Scientific Centre of Shiraz University of Medical Sciences. Then, it was transformed into scenario (Drawing up the instruction for transforming a lesson into electronic format) with collaboration of electronic content production experts in the Advanced Electronic Training Scientific Centre of Shiraz University of Medical Sciences. The related images were also attached. The developed scenarios were approved by the Deputy of Electronic Content Production and Development of Continuous Training Centre where the evaluation was made. At last, the content was developed by the Articulate Studio software and prepared in the form of installable and runnable electronic contents on LMS medium, and then presented by the technical experts and evaluated by the experts in charge of production section in terms of training and technical aspects.

Producing the electronic contents used in this study was based on the training design model developed in the Advanced Electronic Training Scientific Centre of Shiraz University of Medical Sciences.

This model includes stages of planning and analysis, development, training design of text, media preparation and development, narrative development, production, metadata generation and storage, final evaluation and presentation where all these stages are around the stage-based evaluation, and in each stage the necessary feedback is obtained.

From the characteristics of each training content, the following can be mentioned: presenting the general objectives of the lesson, dividing the lesson into short pieces, presenting the learning objective, presenting the key concepts of each piece, presenting the complementary sources of each

piece, presenting the self-examination of each piece, summarizing all pieces in summary section, final exam and presenting the lesson resources.

### **2.2.3. Implementation**

Once the education semester started and the required explanations on research objective and written informed consent letter were obtained, pre-test was conducted on the students on the presentable content in the first half and as eight training sessions were delivered in lecture form, post-test was conducted.

To present the lesson in learning path, after the midterm exam, a briefing session was conducted on how to use the system and presented lessons. Then, pre-test was made on the content of second half of the course and once the training sessions by learning path was finished, post-test was conducted.

The medium used in electronic course was the learning management system of electronic centre of Shiraz University of Medical Sciences in this address: [LMS.VU.SUMS.AC.IR](http://LMS.VU.SUMS.AC.IR) where the students logged in the medium by entering their username and password and used the content loaded in the electronic learning medium.

In such medium, the study path was designed where learners had access to all contents and could progress through their learning speed. The students' usage rate and study time were also recorded by the system.

Lesson content was performed in multimedia form together with playing the speaker's voice and the user could use the embedded facilities like pause, forward, backward or selecting the previous and next slides at his/her discretion.

At the end of each training piece, the false or true and multiple choice tests were embedded and if the user answered the questions correctly, he/she was allowed to study and observe the next slide and if answered incorrectly, a feedback was given to him/her. Hence, it was attempted to make the teaching and learning more dynamic and effective. At the end of each content, there was a final test so that the student could evaluate his/her learning.

Discussion forums were established to communicate simultaneously and non- simultaneously with the teacher and other peers. Furthermore, the students were notified of the teacher's e-mail to solve their problems, if any.

### **2.3. Data collection**

Researcher-made questionnaire was used for data collection, in form of pre and post-test.

To prepare the questionnaires before the first semester (2017-2018), multiple choice questions were pooled based on the content of social psychology curriculum. After receiving confirmation from the professors and based on curriculum design, questions were divided into two groups of pre-tests and two groups of post-test. Each questionnaire included 40 multiple choice questions. Then, during appropriate time intervals (before beginning the topics in form of lecture and after that, as well as before beginning of e-course topics and after that), they were handed over to students. Then, questions were analyzed in terms of discrimination coefficient and difficulty index. At the end, questions with 0.5 difficulty index and proper discrimination coefficient were selected; and questionnaires with 30 multiple choice questions were prepared and used in the research with final score of 20 for each test.

### **2.4. Data analysis**

After data extraction, paired t-test was used to compare learning level before and after each intervention. To compare the two methods of lecture and E-course, independent t-test was used.

## **3. Result**

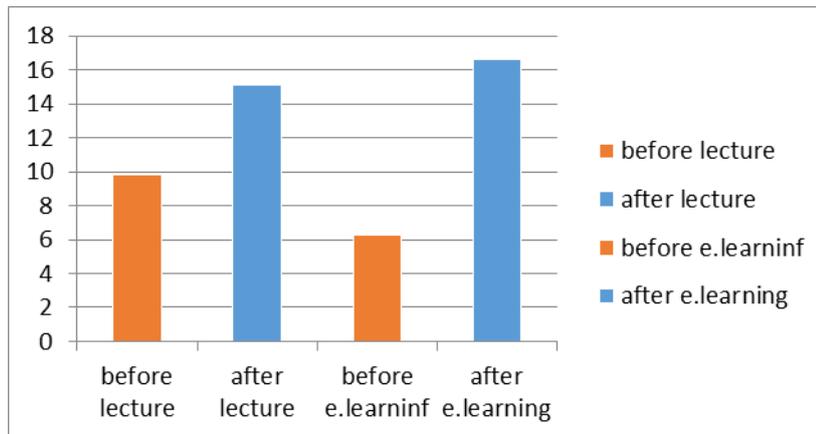
**Table 1. Demographic Information**

Sex		Age	History of the company at the psychology workshop	Introduction to E-Learning
F= 23	M=18	19.46	12.19%	7.31%

Total of 44 individuals took part in this study, amongst whom three people were excluded since they did not take part in test sessions. From the remaining 41 individuals, there were 18 male and 23 female.

**Table 2. Review of Changes in Mean Score of Students Before and After Interactive Lecture and E-course of Learning Path**

Learning method	Number of participants	Standard deviation $\pm$ mean	Median (minimum-Maximum)	Statistical indicator Paired t-test	p-value
Before lecture	41	9.81 $\pm$ 2.58	10(4-16)	11.11	p<0.001
After lecture	41	15.1 $\pm$ 2.37	16(9.2-30)		
Before learning path	41	6.24 $\pm$ 1.89	6.6(3.3-10)	18.88	p<0.001
After learning path	41	14.59 $\pm$ 2.6	14.6(6.6-18.6)		

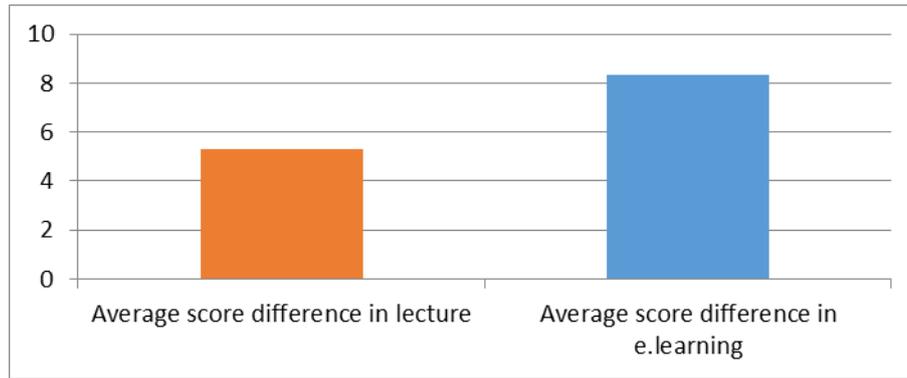


**Figure 1. Average score in both group**

Findings showed that there was a significant difference between mean learning score of students before and after interactive lecture (p<0.001). Also, there was a significant difference between mean learning score of students before and after E-course of learning path (p<0.001)

**Table 3. Comparing the average score difference of psychology (before and after) between the two interactive lecture and E-course.**

Method	Average score difference	Standard deviation	Statistical indicator (t-test)	p-value
Lecture	5.29	3.05	4.605	p<0.001
E-course	8.34	2.83		



**Figure 2. Average score difference in both group**

Average score difference of psychology before and after taking the curriculum was significantly different between the two groups of interactive lecture and E-course ( $p < 0.001$ ).

#### 4. Discussion

Results from the present research with the aim to compare the effect of two teaching method of lecture and electronic course of learning path in nursing students of Shiraz University of Medical Sciences showed that both methods can promote knowledge. However, considering the average score difference of pre and post-test, increase of knowledge level in E-course was higher than that of lecture method. This finding is in line with the result of some studies comparing traditional and new methods of learning.

Study performed by Azizi et al., (2017) with the aim of comparing traditional and virtual training courses in teaching oral and dental diseases on 39 dentistry students showed that virtual teaching is accompanied with more learning (Azizi A, et al 2017). Study of Morente et al, (2014) in relation to E-training effect on learning evaluation of bedsores in nurses showed E-training was more effective than traditional method (Morente L, et al, 2014). A study by Sherestha 2014 titled “effect of educational intervention on performance and knowledge of nurses during infant care in Kathmandu” showed that educational intervention improves knowledge and performance of nurses (SHrestha, et al. 2014). Fani et al. (2012) showed that mean score of knowledge in multimedia-based group of dentistry students was significantly higher than traditional method (Fani M, et al, 2012). Jonas and Burns (2010) in their study performed in London suggested that using E-training is more effective in learning and performing children’s pain management among nursing staff (Jonas, 2010).

Michelle et al. also evaluated the effect of E-training on learning level of 231 nursing student and the results showed that those students repetitively having access to web-based training sections have gained higher scores than students using traditional methods (Mitchell EA, et al, 2007).

In general, E-training might be more effective than attending classes, due to focus on important information according to the idea of learner, passing the unnecessary information, possibility of review and exercise at any time, as well as being student-centered (Bahadorani M, et al, 2009). Considering students access to numerous information in E-learning and since they are responsible for their own learning, more in-depth learning takes place (Mitchell EA. et al, 2007).

In this method, simultaneous usage of three visual, audio, and text methods of training; tutoring; learning at any time and place; individual learning besides joint learning; specifying speed and procedure of training and learning according to individual needs by every learner provides the possibility to learn more (Baniyaghoobi.M et al, 2014).

Researches performed on learning through various senses indicates that a learner with possibility of hearing, seeing, and having mutual interaction with learning environment might remember information, up to 80% (Elliot, 2010).

According to Wu, virtual training method is more effective for in-depth understanding of content, since it can involve students in their own learning process (Wutoh. R, et al, 2004).

On the other hand, these findings contradict the findings from some other research cases.

Study performed by Pani Ti Pumpi (2017) with the aim of comparing cam-icu in nurses in two electronic and face to face method showed no significant difference(Pani Ti Pumpi, 2017).

Study performed in Florida by Soper et al., (2017) with the aim of compare three method of traditional lecture, E-training and self-reading at home on professional level of knowledge of nurses in relation to acute coronary syndrome was not indicative of a significant difference(Soper, 2017).

Sheikh Abumasoudi also (2015) indicated that nursing students' knowledge in terms of cardiac dysrhythmia was similar in both lecture and E-training methods(Sheikh Abumasoudi.R, et al ,2015). Also, according to Zolfaghari, no difference existed in learning level of lecture method and E-training, in training maternal and child health(Zolfaghari. M et al, 2007).

Differences in type of E-learning methods in e. training software and internet-based websites of medical sciences, as well as differences in content of the curriculum presented, and the number of samples and method of training might be considered as a reasons for the difference(SiavashVahabi. S etal, 2011). Bahadorani in his study on the effectiveness of three methods of online, classroom training and a combination of both amongst medical students suggested lack of learning management system and using asynchronous online method of training as the reasons for lack of difference between these three methods(Bahadorani.T, et al., 2009).

However, effectiveness of E-course was shown in many researches. The difference between present research and the aforementioned methods is using E-course of learning path.

In E-learning systems, training has to have a path through which the learner is able to learn with the least amount of support provided by instructor and through self-centrism(Sheikh Abumasoudi R. et al, 2015). In learning path approach, training course is designed in a way that each learner has a training system allocated to him/her based on his/her interests, capabilities, and preferences. In learning path, various activities might be defined for the learner in each stage of curriculum and the learner does his/her activities based on defined procedure and with no need for the presence of teacher(Omrani et al ,2010).

In a study performed by Smith (2016) on 496 high school students in form of clinical trial with the aim of comparing traditional method of teaching and E-course of learning path in teaching science, it became clear that learning performance in students of learning path group compared to another group was significantly better, which is in line with the present study findings(Smith.D et al. 2016).

## 5. Conclusion

This research was performed in 2018 with the aim to compare the learning level of nursing students in psychology, through lecture and E-course via learning path.

Considering the effect of E-training on learning path in promoting knowledge as well as to increase the application of E-training in medical sciences this method might be used in presenting some curriculums.

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