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Purposive E-Test Based Training: An Effective Step in Facilitating Learning

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ABSTRACT

With regard to the learning problems and poor study in numerous students in different courses, the utilization of new training methods including the e-tests and purposive educational content will result in visible and tangible results in learning and help the students with learning disabilities to reach the levels close to the average. The two-year implementation of this plan has had the successful results and experiences in effective application at schools and institutes. Furthermore, the attention to theoretical framework of this approach and its correlation with modern methods of teaching can be a key for solving the teachers' educational problems at schools and institutes.
KEYWORDS: E-learning, e-test, learning environment, teaching methods and techniques

1. INTRODUCTION

The 21st century is faced with the emergence and influence of a culture called the digital culture. This culture has affected the methods of activity, social communications, entertainment methods, as well as the learning methods in current generation. In other words, this culture has made major changes in human life. Teaching and learning are also among the areas which are affected by digital culture. Stephen (2009)[1] argues that the change in learners' attitudes and motivation is one of these changes in teaching and learning. Prensky (2005)[2] describes the new generation learners as the generation of "involve me". In other words, this generation is unsatisfied with one-sided learning environments and seeks for learning environment which interact with them and involve them in learning process. The increased number and variety of learners with different learning and cognitive styles is another challenge for current education, and thus the traditional teaching methods cannot meet them [3].

On the other hand, the improved efficiency of educational system is largely dependent on the learners' educational achievement. The evidence of international test (such as PIRLS and TIMSS) indicate that the Iranian students' educational achievement is not desirable despite the fact that the main purpose of educational system is to lead the learners to a desired level of educational achievement which is worthy for the years of spending time at school. In this regard, the studies indicate that different factors affect the effective educational performance. Investigating and identifying the factors affecting the emergence of this phenomenon can be the basis for development of programs for reducing this phenomenon in the country [4].

2 - Concept of e-learning

The e-learning is a dynamic learning. The e-learning has been redefined and improved based on the technological advances over time. The group of Harris Cross Company (2004)[5], Fournier (2006)[6] and Garg and Jindal (2009)[7] came to the same conclusion under which the e-learning can be established as a way for creating the teaching and learning process through the Internet and information technology systems. The e-learning consists of three basic elements (Anderson, 2004)[8]: The process of education by teacher, the learning process (student), and content or knowledge offered via the Internet. Figure 1 shows a model under which the interactions of map between three elements will result in six types of dual relationships (Bens Pardamean and Teddy Suparyanto, 2015) [9]. (See Figure 1 and Table 1)

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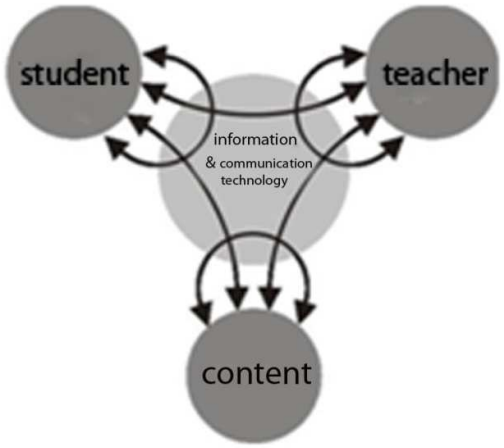

Fig. 1. Map of interaction between the student, teacher, and content through the use of technology

Table 1. Examples of implementing the information and communication technology based on the interaction through the e-learning elements

No.	Relation	Examples
1	student-student	chat, forum, email
2	student-content	download, search, view, create
3	student- teacher	chat, forum, email
4	teacher-teacher	chat, forum, email
5	teacher-content	upload, view, create
6	content-content	link files, indexing

3- Definitions of e-learning:

Several definitions are provided for e-learning; some of them are presented as follows:

E-learning is defined as learning through participation in computer training courses by a variety of media including CD-ROM, intranet and Internet. The e-learning applications via the computer are available through the multimedia in the form of listening or written text, audio, image, and animation with video. These applications can apply a variety of teaching- learning approaches (Mashayekh, 2010) [10].

According to some scholars, it can use any type of electronic equipment which supports learning activities. In other definitions, it includes teaching and learning in a way that it allows the learners to have access, unlimitedly in time and space, to diverse learning tools such as dialogue, evaluation, presentation of content and document sharing system (Foroughi-Abri et al, 2015) [11].

Considering the complex definitions of e-learning, Horton chooses a simple definition: The e-learning is the application of information and computer technologies to create a learning experience. A wide range of technology can be utilized in e-learning; for instance, the Internet, intranet, video, television and CD-ROM (Kharazmi et al, 2012) [12].

4- Functions and design of e-learning environment

Some of the new research findings (OECD, 2007)[13] about learning science in designing the e-learning by continuous learning strategy are as follows:

- The brain never loses the ability to learn. Especially if learning is in interaction with environment and actively followed up, it will cause the physical changes in brain.
- The emotions change the neural tissues.
- The brain flexibility (the ability to change the behavior in response to environmental demands) depends on the type of learning experience, learner's age, and other stimuli in learning environment.
- Learning means creating the infrastructure for knowledge creation and transferring the new encryption in brain storage banks, or in other words, the improvement of mind representation for doing the tasks.
- The electronic technologies are considered as the wonderful support platforms for improving the access and transferring the encrypted representation.

- The insight which is achieved by new understanding of concepts is one of the strongest motivations for continuation of individual learning.
- Deep understanding is obtained through activation of high cognitive levels namely the analysis, composition, evaluation, and meta-cognition.
- Deep understanding helps the creative thinking, conceptualization, and knowledge production.
- The learning designing in general and e-learning in particular emphasize on learning activities in interaction with peers and environment.
- The informed synergy between pedagogy and technology is increasing in designing the e-learning.
- The use of interactive approaches enhances the quality of learning by cooperation in teaching-learning process (Mashayekh, 2009) [14].

Some researchers have critical attitudes towards e-learning and e-education and raise the disadvantages of e-learning. For instance, in an article entitled "E-learning, ideas, backgrounds and its pathology", Atashpour and Aghaei (2005) [14] have explained as follows: The studies indicate that e-learning needs more time than the classroom, and the students in the process of education are less able to grow their own talents. Thompson's study (February, 2002) indicates that the students participating in live education show up to 30 percent more accuracy than their counterparts in e-learning and they do their homework 41 percent faster. In other words, from the perspective of this researcher, the e-learning leads to the growth in people who do things slowly and make a lot of mistakes. (Atashpour and Aghaei, 2005) [14] However, it should be noted that, given the growing academic failure in the education system (which is mentioned in the introduction), if the e-learning leads to the growth in weak students, it will be appreciable. This will be discussed later.

Some other critics also believe that purchasing and installing the e-learning software including the learning management system software and learning content system as well as forcing the teachers to teach the lessons in them and developing the costly and time-consuming content cannot alone provide a successful e-learning system, thus it is essential to do design a systematic and comprehensive education system including the stages of system analysis, design, development, implementation and evaluation in order to create and design an appropriate environment of e-learning (Foroughi-Abri et al, 2015) [11].

The following research can be considered in designing the e-learning environment: According to a research by Foroughi-Abri et al (2015) [11], an integrated model has 12 main components for designing the e-learning environments by combining the features of systemic approach in educational design (consistent with cognitivism and behaviorism learning theories) and the principles based on the constructivism theory. There is a logical correlation between the factors involved in e-learning technology such as the software and hardware infrastructures, resources, support and factors based on pedagogical principles affecting the e-learning such as setting the goals, analyzing the learners in terms of differences in the abilities and skills in arrival, teaching-learning strategies, methods of interaction and control, test and evaluation of the whole course and the learners' knowledge.

5- E-tests

5.1. Important features of e-learning: Combined learning and use of learning experiences

Considering the advantages and disadvantages of traditional and electronic methods and limitations of each method, some researchers have turned to a combined education and believe that the combined learning is an effective approach to solve problems. The combined learning can be an effective approach to increased effectiveness of learning, ease of access to educational materials and an effective increase in costs. Furthermore, due to providing various opportunities for learning, it pays special attention to learners' individual differences in addition to increasing the attractiveness of learning, because everyone does not learn in a same way, thus it seems essential to utilize different methods for education (Salehi-Omran and Salari, 2012) [15].

The process of curriculum has always paid attention to providing and designing a set of learning opportunities and experience as the planners' one of the important steps and measures. This importance is based on the fact that principally the learning opportunities and experiences should be utilized along with the content as the important tool to achieve the goals of curriculum. The learning experiences are, in fact, the fundamental and essential tools for achieving the education goals which should be gained by learner. Zais believes that the meaningful learning activities and experiences are at the heart and center of curriculum because they play the crucial roles in creating the student's experience and consequently in its education. However, it can be concluded that the learning experiences, not just the content, are the tools for achieving all purposes of curriculum. These purposes do not only consist of the knowledge and understanding.

In fact, if we accept that the student plays a pivotal role in learning process and changes resulting from it, it necessarily should be noted that learning is done during the learner's experiences. Learning and thus the education objectives will be achieved through these experiences. (Amini et al, 2009) [16] With respect to the above-mentioned cases, the e-learning can be considered as a tool for achieving the learning experiences.

5.2. E-learning implementation strategy with an emphasis on purposive e-tests

During the education and teaching process, each teacher and professor is faced with problems such as low potential and basis weakness, the students with learning disabilities such as short-term memory and mental and even hearing problems which lead to the reduced learning. For these students, despite the fact that the public teaching and lecturing do not fulfill the needs in these students, it seems necessary to spend special attention and energy for weaker learners. In this regard, the purposive e-tests, which record the educational goals in student's mind by rehearsing, will lead the leaner to target educational purposes and prevent the energy loss in teacher and contribute to the process of teaching and learning.

Unfortunately, the educational content is still presented by traditional methods only by pamphlets, books and sample copies of questions at numerous schools and institutes. The questions are responded by teacher for many times, but since the students are passive, learning takes place with a little depth or it can be argued that it actually does not happen, and thus parroting will be the only outcome of teaching process. However, if learning by implementing electronic tests (which will be described later) is performed in order to achieve the educational goals, learning will be done with more depth.

Rehearsing and learning for individual mastery will be among the features of this project as described in the books of teaching methods and education experts (Ahangari, 2013) [17].

The following cases can be mentioned for mastery and individual learning:

The difference in students' talents depends on the time and in fact the talent is the duration when a student needs for complete learning and mastery in lesson. If the students have enough time to learn, they can become mastery in lesson and learn it perfectly, thus there will be no weak student; therefore, almost all scores will be at the same level. (Shabani, 2008) [18] The following figure shows the factors which affect learning. (Figure 2) The following diagram is in fact a summary of the same source.

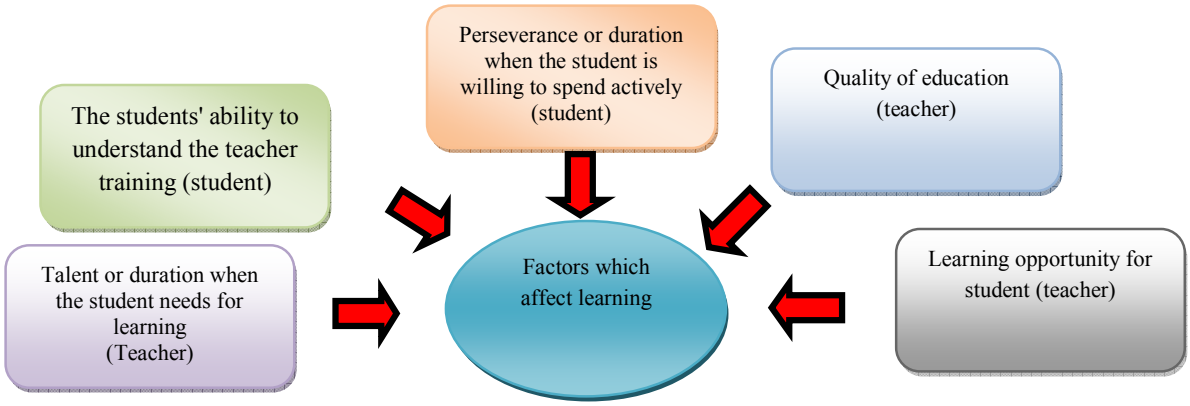

Fig.2. Factors which affect learning

The diagram above investigates the factors which affect the individual learning. Obviously, from five factors which affect learning, three ones can be controlled by teacher and two other ones (the power of understanding and perseverance) by students and the teacher may be less able to take control over these cases.

It should be noted that since the mastery learning theory seems ideal and unattainable, it will be almost successful according to author's experience if the student has the opportunity of rehearsing with educational software.

The critics may focus on this fact that the e-tests will lead to the parroting memorization in student, but it should be noted that the student will be faced with a variety of different questions such as true/false, puzzle, sorting, etc which are at the high cognitive levels of understanding, analyzing and solving. (Ahangari, 2013) [17] For further investigation of cognitive levels and hierarchies, you can refer to different books of teaching methods and techniques. (Safavi, 1999) [19]

In fact, the use of these e-learning tools can be implemented at three following levels:

- Curriculum: Designing the content proportionally to the students' age and learning conditions;
- Education: Conveying the information regarding the students' past experiences and interaction;
- Assessment and evaluation: This software is in fact a quiz creator, but it can be considered with a vision of interactive educational content. (Ahangari, 2013) [17]

(In fact, the cases above include three stages of planning, implementation and evaluation which create three main stages of learning cycle) (Kosari, 2010) [20] This learning cycle can be implemented by the following model and diagram. (Figure 3)

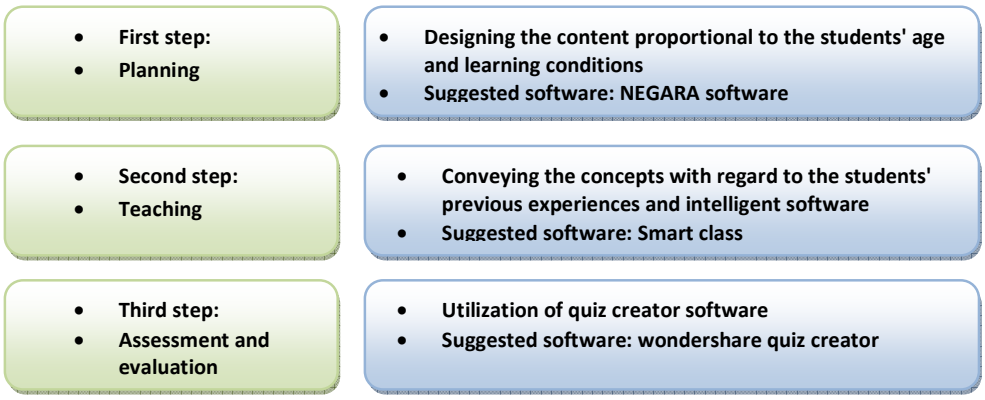

Fig.3. Major steps of learning cycle

Unfortunately, it can be seen in a great community of education that only the smart boards and intelligent devices are taken into account and the education of human resources is less considered in optimal use of tools whenever there is a debate and discourse of educational technology and new methods of teaching.

Instead of the hasty use of technology in each three above-mentioned step in learning process, we can step by step replace the use of technology by inefficient traditional methods by appropriate human resource training and holding the sessions for managers and trainers and all ones involved in education process. (Ahangari, 2013) [17]

The personal learning is another issue associated with computer-based training. A package is considered for each person in this method and if he is able to pass the questions and related topics successfully, a more advanced package will become available for him. According to the advantage of this method, a less time will be spent for a more capable student who needs less direct training, but this method needs precise curriculum and education. (Ibid, 2013) [17]

By changing the content of textbooks particularly the courses, in which the loss is much more obvious, to questions with great diversity (such as changing a page to about 5 questions proportional to the educational goals of that chapter or section with a variety of blank positions, correct/false, etc.), the student can be familiar with the aims of that page and a part of that book, and in fact the student's unconsciousness (even unmotivated student to learn the educational books) learns the content of book without direct reading. This can be possible by the use of software quiz creator software, and it is possible to give the target feedback to student by appropriate messages such as "Congratulations" or "Try it again!" in order to get the correct answer after several repetition and practice and thus practically and conceptually understand the subject (Ibid, 2013) [17](Figures 4 and 5)

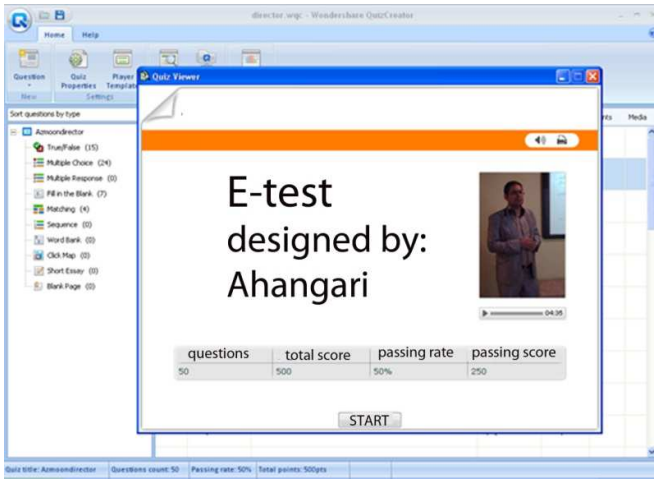

Fig.4. A scheme of quiz creator space and preview of first page and quiz introduction

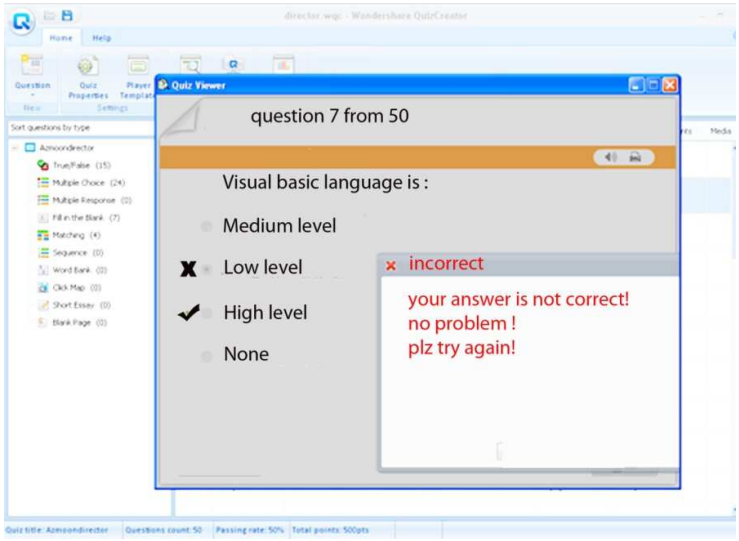

Fig.5. A scheme of test implementation and the wrong answer and feedback guiding the student with appropriate message

6- Benefits and final goals of e-tests

Using e-learning and e-contents and e-tests, which are applied by author in several art schools and educational institutions, will lead to the following objectives and benefits:

- Using the practice and repetition method (the computer randomly raises a question of educational content at any time of implementation and thus the student will be guided to the next step by replying to that question. The student can implement the test for several times and respond to the questions according to the proper and almost unlimited learning opportunity)
- Variety of questions (true/false, matching, sorting, black positions, etc.)
- Changing the educational content of book to a variety of questions which double the respondent's motivation to question (inclusive).
- The feedback of response to each question. If it is along with the appropriate encouragement or message such as "well done" or "be careful", it will lead to the better result and performance.
- The possibility of randomly replacement of options and questions prevents the student's parroting memorization.
- In addition to the use as the tools for assessment and evaluation, the quiz creator software can be utilized as the tools for learning and facilitating the education and establishment of learning by giving the appropriate feedback to student and directing the students to the next step and more complex questions at the high levels of cognitive domain.
- Reduction of energy consumption in the classroom and the utilization of e-learning as the educational complementary are among the main advantages of this method.
- The use as a teaching aid for students with learning disorders (such as hearing impairment, short memory, etc.) (It is applied by author in some cases and has had the relatively good results) (Ahangari, 2013) [17]
- The ability to use the audio, image, etc, to attract more audience

7- Limitations of project

1. Negative attitudes and resistance to change in the field of applying the electronic methods especially for weak students or with learning difficulties (It should be noted that the capable students do well their mission, and a capable teacher utilizes the available resources to solve the problems in students with high educational failure).
2. Low preparedness in manpower in applying the new educational methods;
3. The need for teachers and trainers' maximum involvement with electronic methods rather than the actively involvement of a small number of them in all meetings and festivals! It is also associated with a change in the managers and employees' attitudes.
4. The limited space and proper arrangement of classroom; the lack of sufficient numbers of computers (even the computers which are not connected to the Internet are out of reach for most of the schools); and the poverty in a large number of students who live in disadvantaged areas and have no computers at home.

8- CONCLUSION

With regard to the development of new science and technology, we can acceptably prevent the educational failure, lack of motivation, lack of effective learning and most of the teaching problems. The e-tests are not only applied as the quiz creators, but also as the tools for learning and direction in line with education and also as the useful tools for teachers in dealing with learning problems (such as learning disorders, forgetfulness in students and the lack of motivation and perseverance) because not only these applications allow the creation of appropriate feedback, but also complete the teacher's leading role namely teaching.

The attention to training the human resources, the change in managers and teachers' attitudes by briefings and training, transferring the successful teachers' experiences to other colleagues, the teachers' research conduction and attention to the changed behavior in students after implementation of e-learning processes in the classroom may change the fear of useful information technology tool to a kind of sweet interactive game which leads to the effective learning.

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