

Original Article



# An Introduction to the Use of Software and Its Impact in Educational Systems

Navid Hasanpour Azad \*

Geotechnical Civil Engineering, Director of Tedin Smart Schools, Amirkabir, Iran



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## ABSTRACT

The present study examines the use of software and its impact in educational systems. For a long time, education has been considered one of the most important and desirable issues of various societies and educational systems have sought to find ways to improve the methods of teaching different subjects. Traditional teaching methods have been used almost identically for thousands of years, but in today's world, new approaches to teaching and learning are gaining attention. Researchers have always sought to find an answer to fill learning gaps as well as to solve problems and deficiencies caused by defects in the teaching and learning process. They look for ways to change repetitive and boring methods into interactive and enjoyable learning experiences for students. Therefore, despite the need and following the efforts made, many teaching-learning methods have changed significantly compared to the last two decades. Likewise, the sources of information, the ways of transferring and exchanging information and how our information is formed have also changed according to these changes. However, in the matter of education, effective education is: Firstly, it leads to learning, and secondly, this learning is sustainable. The realization of these two requires the use of five comprehensive senses and the use of direct and first-hand experiences. Experience shows that different senses do not play an equal role in human learning. It is easy to use the sense of sight in multimedia programs and software due to the use of visual media in the form of movies and photos. Therefore, today many studies have focused on the use of computers and multimedia in education.

## Introduction

Computer-assisted education and multimedia provide special advantages for children, including visual presentation, self-regulated learning,

highly stimulating sound and graphics, immediate feedback, and the opportunity to take control of their own learning, pointed out [1-3]. Although it is believed that educational multimedia provides rich resources that can be an opportunity for the growth of learners and

\*Corresponding Author: Navid Hasanpour Azad ([Nh.hasanpoor@gmail.com](mailto:Nh.hasanpoor@gmail.com))

that is the creation of a collaborative environment that allows learners and teachers to search and investigate various issues [4]. But educational software by itself has little effect on learning and teaching. Undoubtedly, this technology creates many opportunities for learning environments and causes significant educational interaction, but alone it cannot increase the quality of teaching and learning [5]. This means that the learning and teaching environment, content supply, learner's activities, how to implement learner's activities, learner's performance measurement process and feedback process should be formed appropriately, otherwise there is no guarantee for the realization of educational goals [6].

Education is a process that cultivates human thought. According to Christian and Mc Robbie, the importance of thinking for humans is so much that life is not possible without it, and the main goal of any educational system is to bring people to think [7]. In fact, every step on the way of thinking is only an attempt to help man thoughtfully in finding the path of his essence. The importance of paying attention to thinking in the educational systems of the world in every era caused the emergence of new methods of education in which thinking and the scientific method of solving problems were emphasized. Among these educational methods, we can mention the pattern of understanding the concept [8].

Concept perception model was developed in 1985 by Joyce and Weil based on Bruner's theory of concept perception. They proposed three methods of this model, which are acceptance-oriented model, choice-oriented model, and unorganized material model [9]. This educational method can be used at any level and class and become the basis for improving the level of critical thinking and metacognitive skills of student. Examining the empirical foundations of the subject shows that the use of the model of understanding the concept has had positive effects in many researches. But today, with the growth and expansion of new educational technologies and the entry of these technologies into the field of education, the attention to education based on courseware and digital

methods has increased and has become a kind of requirement for learning environments. Therefore, the construction and application of courseware based on supported learning methods is of particular importance [10]. This issue has become more necessary for difficult subjects such as English and requires new researches [11].

The use of multimedia adds a new dimension to the dimensions of old teaching methods that were not available to teachers before [12]. Therefore, the power of these software's in high-level education on one hand and the increasing complexities and needs of the current world in educational fields on the other hand, make us to turn to new, efficient and effective models in education and training [13]. Likewise, by applying the fundamental theories related to these patterns in the construction and design of multimedia, we will make the learning conditions of learners easier and easier [14].

Researches have shown that education based on multimedia can help students' understanding and memorization. In fact, educational multimedia is one of the media systems that, due to their multi-sensory nature, can easily adapt to various learning styles and provide easy and stable learning with various forms of interaction [15]. The advantages of multimedia can be creativity, saving time, eliminating useless activities, adding time for communication with students and discussions, presenting materials in various formats, identifying different learning styles, active learning with feedback, the possibility of repetition, and tailored learning [16]. It was mentioned with a special inclusive speed while controlling the learning process, facilitating participation in activities and establishing a two-way interaction and relationship with the user [17].

Mayer (2001) also considers the logical reason of multimedia presentation, i.e. content presentation in the form of words and images, to use the entire human cognitive capacity to process information, and considers the advantages of multimedia education to be explained in the following axes.

(1) Learning has an active mode and prevents students from dozing off, because this cannot be done in front of a computer. The car needs some work that requires minimal attention.

(2) Any wrongdoing of the student during an exercise is immediately reminded and corrected, and it is not possible to argue or make mistakes in front of mistakes [18].

(3) Many students can hardly express their thoughts in front of the class and the teacher, and these prohibitive factors do not exist in front of the computer. Students know that they may make mistakes without being humiliated or blamed [19].

(4) Every student can work according to his ability and learning power.

(5) The way of teaching is such that it is more attractive than the classes managed in a traditional way [20].

(6) Multimedia visualizations make mental and abstract concepts understandable.

In addition to the theoretical foundations that support the use of multimedia and the model of understanding concepts in education, the empirical foundations support the use of this multimedia and the model of understanding concepts in education and learning [21]. Among the studies carried out in this field, we can mention the research of Salehizadeh and Asadi (2013), who have reported positive results of its use by building and designing a multimedia researcher and using it in geography education [22].

Heidari *et al.* (2010), by comparing the effect of teaching using English educational software and teaching in the traditional way, reported that the use of educational software is more effective than the traditional method on the academic progress and motivation of students towards learning English [23].

Kumar and Mathur (2013) by comparing the effect of two educational methods of understanding the concept and the traditional method of teaching physics on the acquisition of physics concepts by students of the ninth grade in Haryana, using the method of understanding the concept in the acquisition of physics

concepts by students is more effective than the conventional method [24].

Mayer (2012) has compared the effect of the pattern of concept acquisition with analogical reasoning in the biology lesson. The results of his study showed that students' understanding of concepts and their thinking skills increases using the method of understanding concepts. Students reflect on their own thinking process and how they learn when they do concept acquisition model activities. Students' attitudes and motivations are improved a bit when they do concept acquisition activities in the form of games, and teachers' motivation and attitudes are also improved by using this educational method [25]. The comparison of the results of the existing experimental studies shows that there is a difference between the results in determining the effectiveness of the model of understanding the concept in comparison with other teaching methods. In addition, the model application of understanding the concept in the form of software and measuring its effectiveness has not been investigated in any of the previous studies [26]. Accordingly, the existence of topics such as the importance of thinking and educational methods that promote the level of high-level thinking for a better understanding of topics such as the pattern of understanding the concept, the sensitivity and difficulty of teaching and learning English for both teachers and students, the introduction of several educational media to the world of education and the need to use them in education, the lack of courseware based on the model of concept acquisition and the lack of research background in relation to the use of courseware based on the model of concept acquisition [27], the basis for the formation of the study have been present. Therefore, in determining the main question and problem of this study, it can be said: How effective is the preparation of a research-based courseware based on the pattern of understanding the concept on the learning and memorization of the English language lesson of the first year high school students? One of the issues that teachers and lecturers of English language classes have always been concerned with is the use of appropriate methods to increase students' ability to learn the language

as a means of communicating with others [28]. In recent years, extensive research has been conducted with the aim of identifying factors that directly or indirectly facilitate language learning. Experience shows that the current teaching method, whether in middle school, high school or university, has failed and any change in language teaching has failed so far. The failure of its language teaching program creates such a bitter experience of failure in language learners that it continues until the end of the language learners' education.

One of the characteristics of today's age is the variety of content that is available to us in the fastest time. In such a situation, traditional learning and teaching methods are no longer applicable. Therefore, a serious effort should be made to optimize educational activities and eliminate traditional and ineffective methods and use new and advanced concepts and methods in educational centers, including schools and universities. Unfortunately, today, despite the all-round growth of learning theories and many trainings for teachers in different courses, many of our teachers still use methods in education that are not very effective and sometimes cause them to become bored with knowledge. Students learn from the teaching process. These issues should be considered considering that we are living in an era where the computer is becoming a useful tool in all aspects of life, including the economy and personal life. Certainly, education cannot remain stagnant in front of these changes. Therefore, today we see a strong influx of educational software and courseware into the market, many of which are not based on existing scientific foundations, neither in terms of educational methods nor in terms of structure and content. The use of these software among different groups of students, especially for difficult courses such as math and English, has become part of the curriculum. Therefore, paying attention to educational tools based on strong scientific theories and teaching and research in their field is of special importance and necessity in the current educational conditions of our society. The importance and necessity of the present research can be explained more and better according to the results of the existing

research on the weakness of the current English language education in schools, as well as the effective applications of modern educational technologies and the need for experimental research in this field [29].

In this connection, Zarei and Avadzadeh (2006) in research entitled: "*Effect of educational multimedia in the learning and teaching process*" reported that the educational multimedia system can be a kind of multi-sensory environment for learning by applying different elements to learning create and by having interactive tools, increase motivation in education and make memory more stable [11].

The results of Khoddam's research (2013) have also shown the positive role of computer lesson simulator software in improving students' motivation and learning. The report of Gharebaghian (2011) in research entitled: "*The effect of using a simulated educational environment on the internal motivation and learning of undergraduate students in the field of geology of Boali Hamedan University*" indicates the positive effects of using the simulation method on the internal motivation and learning of students in the earth course [19].

Clark (2008) reported in a research that he has done in relation to new media and information and communication technology, including educational software on motivation and learning, that simulator software even increases the motivation of teachers along with increasing learning. Studies have shown that when educational aid software is used appropriately, it can significantly and effectively help improve teaching and increase learning. Competent use of the software requires an experienced teacher [18].

In this regard, Postholm (2006) conducted research on the effect of the use of information and communication technology in high school education on teachers and students in Norway and found that information and communication technology does not eliminate the role of teachers, but it can guide the discussions between students and teachers and students. It

seems that educational software plays a high role in learning lessons for students [1].

The more the educational content and the means of sending information are similar to the type and way of learning of people, the higher the learning power of people. This study has been faced with limitations: Limitations in generalizing the findings to other genders (girls) and different ages, the drop in participants, the reluctance of families to encourage language learners in this way, and the existence of defects in the tests (pre-test and post-test). Although the results of this research and many past researches showed that the new methods of educational technology have a positive and significant effect on increasing the progress of knowledge and reducing anxiety and increasing performance, but the widespread use of these software still requires more research to investigate the effect. Components such as the type of course, level of education, and even moderating variables such as gender are needed. All teachers may not have sufficient mastery of teaching with these software's, which requires in-service training planning [26].

Swain *et al.* (2008) conducted research entitled: "*The role of simulation software in academic progress in technical courses*" whose results indicated the effect of using this software in the academic progress of students' technical courses. Research was conducted by Wolfe *et al.* (2002) entitled: "*Investigation of teaching courses using simulators in the field of architecture*". The studied group were architecture students and simulation tools were used in the classroom, the results of which indicated the favorable effect of these software's in learning lessons [27].

In a research, Raymond and Shepard (1997) investigated the role of simulation software in an ideal educational environment with two experimental and control groups. The results indicated the positive effectiveness of multimedia software in teaching technical courses to learners. A research was conducted by Razavi (2004) under the title of "*Effect of the order of presenting examples and generalizations through educational multimedia on the learning*

*and memorization of experimental science concepts in the fifth grade of elementary boys' schools in Delijan*" and the results of the impressive role of educational multimedia on the promotion of learning and memorization of concepts have been [28].

Karami and Attaran (2006) investigated the effect of multimedia creation by students on their learning rate. The results showed that the students who were trained in the science lesson with the multimedia construction method in the classroom compared to the students who were trained with the traditional method, had better and deeper learning. Nowadays, the use of computers in classes is of special importance in the fields of teaching and learning English as a second language. Therefore, it has made many researchers to conduct research on educational application and its effects [29].

Ortiz (2007) conducted research on the effective factors in learning English. He considered appropriate curriculum and educational program, involving students in the teaching and learning process, creating a suitable learning environment, sharing teachers, principals and parents in school decisions and the effectiveness of teachers' knowledge as the most important factors in achieving the set goals of the English language [30].

He also considered the creation of opportunities to learn skills and access to curriculum and educational programs as factors that are effective in teaching and learning English. Lourdes (2000) conducted a study on computer-assisted English language learning for non-native English speakers who have less proficiency than native English speakers. The research was conducted on third grade students in the computer lab. The working method was that synonymous, opposite, and compound words were presented to the students through the computer with related shapes and images along with the sound, and the students had the possibility to interact with the computer. The result of the research showed that the ability to distinguish synonyms and antonyms and compound words by those trained in this way has increased significantly. Brinton (1999)

explains the logic of using media in foreign language education as follows:

1. In the same way that media play an important role in people's social life, they are also an important factor in the classroom to motivate students to learn [4].

2. Media facilitates the learning process by creating a more realistic learning environment.

3. The media make the relationship between the classroom and everyday social life situations more tangible for language learners by authenticating the subject matter.

4. Considering that the learning styles of language learners are different, the media fulfills their needs of hearing and seeing one by one [12].

5. Using the media, the teacher takes advantage of the important role that input information plays in language learning, provides various information sources to language learners, thereby reducing their dependence on the teacher's accent and enriching their learning experiences.

6. The results of the conducted research indicate that the educational media make it possible for the teacher to present the materials coherently and effectively, and by stimulating the different senses of the language learners, they make it easier for them to understand the materials.

The California University conducted a study on the impact of media that compared the educational progress of children in basic skills such as reading, writing and problem solving before and after the use of educational media, and the result of the study showed with 95% confidence in 32% of the samples that educational media has been effective.

### *The Impact of Technology on Education through Virtual Education and Electronic Content Production*

#### *Technology Is an Important Catalyst For*

(1) Transforming schools into innovative and dynamic institutions where students become more motivated, curious, and creative;

(2) Connecting students to the wide network of the world of knowledge and information so that they can gain broad basic knowledge and a global perspective;

(3) Cultivating abilities in students for effective and efficient processing of information;

(4) Development of attitudes and capabilities needed to independently achieve lifelong learning.

Anderson considers e-learning in virtual education and electronic content production to be more than providing educational content with the web. He considers the learner and the learning process to be the focal point of the electronic learner and defines electronic learning as such. The learner uses the Internet to gain knowledge and build personal meaning, develop learning experiences, access learning content, interact with the content, the instructor and the learner, and to get support during the learning process. Virtual education and electronic content production include all educations that are conducted using electronic tools, such as audio, video, and computer, network.

Research entitled: "*Investigation of the effect of computer-assisted education in comparison with traditional teaching methods on English language learning in the first year of high school*" was conducted by Fazelian and Saadatmand (2004) using a quasi-experimental method, and the result showed the positive effect of computer-assisted education on English language learning. In a research conducted by Abbasi *et al.* (2009) under the title of teaching and learning problems of the English language course of middle school students in Isfahan city from the teachers' point of view, they came to the conclusion that the role of cultural, social, individual, and educational factors is more than the average level and the factors of phonetic system, vocabulary Persian language and Persian grammar have not had much effect on the teaching problems of learning English in secondary school. Furthermore, based on the findings, there is no significant difference between the opinions of teachers regarding the teaching problems of English language learning according to their academic qualifications and

experience, but this difference was significant according to gender regarding individual factors. The results of the research conducted by Abbasi *et al.* came to the conclusion that the average level of teaching problems is the English language course in secondary school. This factor may be caused by the weak content of English language textbooks, the lack of appropriateness of textbook texts compared to students' ability, not using diverse and active teaching methods [31], lack of hours dedicated to language lessons, not using language laboratories, overcrowded classes, not using efficient and capable teachers and continuous class tests, the teacher's lack of mastery of English language knowledge skills and even teaching English with the help of Persian language and things like that. The results of the research findings that Behrangi and Asadi (2008) entitled: "*Associating the multimedia builder software with the word picture inductive teaching model for teaching English in the first grade of middle school*", concluded that the use of the said software increases the vocabulary, the ability to understand concepts and skills. In sentence formation and grammar, spelling and writing of English words was compared to the control group. Mayer (2012) has compared the effect of the pattern of concept acquisition with analogical reasoning in the biology lesson. The results of his research showed that students' understanding of concepts and their thinking skills increases by using the method of understanding concepts. Students reflect on their own thinking process and how they learn when they do concept acquisition model activities. Students' attitudes and motivations are improved a bit when they do concept acquisition activities in the form of games, and teachers' motivation and attitudes are also improved by using this educational method. Kumar and Mathur (2013) in a study entitled: "*Investigation of the effect of the pattern of understanding the concept on the acquisition of physics concepts*" investigated and compared the effect of two educational methods of understanding the concept and the traditional method of teaching physics on the acquisition of physics concepts by the students of the grade 9<sup>th</sup> in Haryana. The results of their research indicated that the use of concept acquisition

method is more effective than the conventional method in acquiring physics concepts by students [31].

## Conclusion

Information and communication technology has this claim and the ability to reduce costs and increase quality through a documented program and by changing the structure and methods of virtual education and electronic content production, and align the products of educational systems with the needs of the society adapt and take steps towards the application of virtual education and the production of electronic content. Many problems that the development of information and communication technology in the country is facing today, such as lack of cultural platforms, lack of skilled manpower, lack of familiarity with foreign languages, low motivation and spirit of search and exploration, and lack of work orientation and effort and action. And in a word, the reduction of life skills is caused by the inability of the traditional education system to respond to the needs of the changing society. Innovation in teaching methods and the use of information and communication technology in schools leads to the development of students' cooperative learning, strengthening the spirit of searching and research, applying education, providing the basis for lifelong education and learning. The most important advantage of virtual training and electronic content production is that it allows participants to set their own schedules. Flexibility gives participants the opportunity to decide when and where to study and how long to spend learning. In this method, the process of virtual education and electronic content production does not conflict with the participant's work schedule, cultural, and social status, and even family responsibilities.

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