

## The Study of the Virtual Educational Systems Effect on Learning Process

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**Abstract:** The pandemic in 2020 pushed the college students around the world to virtual learning. Traditional and virtual educations have differences in terms of efficiency and knowledge process. This experimental study has been conducted in 2022 and evaluated 384 male and female bachelor university students of Islamic Azad University, West Tehran Branch. The study examined the effect of virtual educational systems type on student learning. This article established and polled various instructional systems for online teaching and learning. These approaches and elements will facilitate in supplying online education effectively. The educational technologies have been improved forcibly through the corona epidemic whole around the world. In the present paper, effect of applying the modern technologies has been investigated on the student learning. Also, many researches on virtual learning undoubtedly are forthcoming post-pandemic. By considering the nature of this subject, the descriptive-analytical method has been used. The extent to which a technology in blended learning influenced student engagement and course performance has been studied. The education through virtual environment could ultimately reduce college completion rates. Also, the most common applications and software which simplify the procedure of designing, analyzing, implementing, developing, evaluating the instructional environment and learning materials to improve learning and teaching have been compared. Then, the matching of teachers and students with these educational virtual systems has been studied. Moreover, the results shows that the instructional elements and modern educational systems can create more inclusive classrooms and empower students with disabilities have been declared. Also, there are differences in the students' characteristics which it may drive differences in the outcome. This study can help in a successful online teaching and learning during outbreaks like COVID-19.

**Keywords:** Modern Technologies, Learning, teaching, Student, Statistic.

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### Introduction

Before the development the modern technologies, the audio and visual tools named as educational technology, and they used by in the classes in teaching. The books, black boards, Television, Radio, Video Projector, Films and so on are the examples of these educational assistances. For many year, these tools facilitate the teaching. Technology is a helpful assistant that supports to make the teaching and learning processes more effective and enjoyable. The educational assistance can help to attract the students. In the later years, the educational software has been improved and results to use the different training kits, real objects, and slides in classes (Raja et al., 2018:33, Khan, 2019:1, Mutiara, (2020)). With using the sound, videos, info graphics, assessments, quizzes, and animation the life has been given to lessons. A range of technology and tools can help students that have trouble with math (Darling-Hammond et al., 2020:97).

This category of dynamic and interactive educational tools make learning engaging for students. But, having the educational assistance program is only truly beneficial if the user set it up correctly, and these software were not so much successful because some of them have commercial benefits rather than educational ones (Sivalingam et al., 2018:14, El-Alfi et al., 2022:132, Karunasri et al., 2022:303). The international community crossed to virtual world from physical ones. We live in digital world now, so it is necessary that teachers equip themselves by innovative and modern educational technology tools. Today, the educational technology can help even students with disabilities learn more effectively. The technology through the corona epidemic improves widely which affects the educational systems and learning (Charles et al., 2019:1, Breyer et al., 2021:344, Bukoye et al., 2019:1, Mahmood, 2021:199,

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Igbo et al., 2014:1, Alvarado-Alcantar et al., 2020:201, Ikechukwu et al., 2020:1). In the present work, the effect of modern technologies on the educational learning of students has been investigated and the following queries have been discussed for a total of 300 male and female Islamic Azad university, West Tehran Branch students. the role of technology in education (How should technology be used for teaching and learning), What types of learners (ages, ability levels, etc.) can best advantage from what types of technology, and how does technology affect the whole educational system. The matching of teachers with this process has been studied. Also, the learning of students with different abilities has been explored. Moreover, assistive technology tools and resources for students with Disabilities have been discussed. The tasks of a teacher include of planning lessons, marking the attendance, homework's assigning, and finally grading. The educational technology simplify these processes, and also improve communication and the learning procedure. Nowadays, the modern methods have been used to students achieve and improve the comparison, argument, analysis, and creativity skills (Kim et al., 2019:99, Orón, 2019:139). The purposes of this research is as follow. Investigation that how the technology affect the educational improvement, and the educational assistance and educational media how can improve the student learning.

The Educational technology is a field of study that explores the procedure of designing, analyzing, implementing, developing, and evaluating the instructional environment and learning materials to improve learning and teaching (Mupa et al., 2015:125, Abed, 2019: 1). The educational technology purpose is to improve the education. In the other words, the educational technology with the regular and scientific principles resolve the educational problems. Therefore, it is not only restricts to audio and visual tools or using the educational media. Indeed, the educational technology include of a systematic modelling, implementation, and evaluation of teaching and learning process based on the specific purposes. Also, it used the psychology learning information, communications science, and various sources to have a more effective training. Growing the quality and quantity of learning is the aim of using the educational technology (Leone, 2019:2545, Munna et al., 2021:1). It is worthy to note that a successful teaching does not always goes to an effective learning. Let to consider two cases. At the first one, the teacher and training has been considered and at the second one, the students learning. Actually, the two cases with each other should be considered as a unique educational system. This study aimed to compare the effect of two virtual learning systems on knowledge and skills of university students. The descriptive statistics of learning satisfaction of two virtual systems have been evaluated. The standard deviations of student satisfaction, the normalized data distribution of two systems, skewness and kurtosis have been investigated.

### **Literature preview**

Through the past two years, because of corona epidemic, besides of the traditional educational methods, so many of students need to use the computer and internet technology to improve their learning. There are various programs which simplify their learning and help them to attain more skills. In the following, the role and benefits of using the information technology for improvement the educational system have been discussed. First, the goals and needs of education have been presented, and the technology for designing the most effective learning environment for students has been argued. In all of areas of educational technology the main goal is the improving a specific aspect of teaching and learning. Actually, the issues and skills that need to be considered by instructors are vast.

The final aim is the best equip and utilize technology in the classrooms, indeed multimedia technology is needed in the classrooms. The instructors and students need to be able to simply use the equipment and access internet, software programs, presentation software, videotapes, and so on when needed. The instructional technology can be considered as a process of solving the educational problems and concerns. The instructional materials and resources have been selected based on the curriculum and the type of instruction to meet the aims of education improvement.

### **Discussion of the Findings**

Here, the important information on instructional Technology has been presented.

### **The Internet and Web Pages**

For students and teachers it is essential to know how system can instructional Technology affect what are communicated or learned and how learning can best occur. They need to evaluate and analyze how to use FTP (File Transfer Protocol), email, mailing lists, telnet, newsgroups, and create web pages. The web pages display the information and help the students to be independent and access to more knowledge. Obviously some tools such as computer, modem, printer, Digital camera, camcorder, LCD projector, scanner, CD-writer and so on are the essential equipment for these goals.

### **Web Panel (Web Board)**

Students and teachers also need to have the essential formation about the newer educational materials for learning and teaching. For example, the teachers must learn about posting the assignments, set upping the discussion groups for students, and audio and video conferencing. Therefore this technology can affect the teaching method and it lead to enhancing a knowledge-level educational system.

### **Audio and Video Conferencing**

Video and audio conferencing meetings have been used when the teachers and students remote from classroom. Actually, the Face-to-face communication is efficient rather than audio one, even if teacher and student can't meet in-person. The video conferencing performs better than audio-only for communication. There are free video conferencing software such as Skype, Free Conference, Zoom, and Google meet and so on for a safe and secure conference. The computer-based instruction are the essential instructional materials that utilize in teaching. The students should know how to create range from bulletin boards and transparencies to PowerPoint, Hyper Studio, and web-based materials. Creation and finding graphics, images, audio files, video files, and animations Word processing, database, spreadsheet, telecommunications, presentation, authoring, graphic paint programs are the other examples. Teachers need to know what these are as well as why, when, and how to incorporate them into their teaching.

### **Classroom Arrangements, Distance Education and Online Test (Evaluation)**

Keeping the students' attention and guiding them through teaching for having the supportive, and productive classroom is possible by educational system. The classroom management tools can be your time-saving and deliver and improve students' learning. Actually multimedia technology need in each classroom arrangement and students and teachers need to be able to swiftly use the equipment and access software when needed. Therefore, Access a virtual space for connection and share learning materials with students, track students' behavior, effectively manage student's grades, document students learning and achievement using digital portfolios, easily possible by using the educational technology. Everyone can download the Apps free with a default account, which allows them to access the Learning Management Systems with Mobile Application which they have been used vastly by teachers and students:

- Google Meet, Teachers (or students) can share their screens for all participants to see as well as record the meeting.
- Google Classroom, This popular application allows teachers to create online forums to share course curriculum, news, or lessons as well as a platform to assign, collect, and give feedback on student work.
- ClassMarker is another online testing software that allows you to easily create tests and save questions to your question bank, which you can reuse anytime. Teachers can view learning outcomes whether they've been completed or if they are still in progress, so everyone always have visibility on how the team is getting along in classroom.
- SpeedExam is a unique online testing software geared towards assisting learners with self-study. It offers 10 types of questions to provide diverse types of challenges to learners. Teacher can even monitor the learners while they take their tests with SpeedExams' exam monitor. With its free version, teacher will get 25 exam attempts per month with up to 5000 questions.

Therefore, the teacher selects appropriate software and educational technology for specific goal.

### **The benefits of educational technology for students with disabilities**

In the past, the improving the educational technologies, the students with special needs had neither the means nor the desire to integrate into a traditional education. Also, the teachers had some problems with students who were unable to effectively communicate as shy, introverted, or problematic. Special education has come a long way since then, and with it, new innovations in technology. Now, the effect of technology on students with learning differences is impossible to ignore [12-14]:

#### **For students who are blind or have visually problems**

Nowadays, many devices such as Google Chrome books can read the content out loud for students. It also has features such as screen magnifiers, high-contrast mode and select-to-speak that make it easier to read contents. Teachers can also plug in or pair a Braille keyboard with Bluetooth if students need Braille support.

#### **For students who are deaf or hard of hearing**

These students can use the FM systems wireless devices that directly transmit sounds to a hearing aid to communicate simply with students who have hearing loss. This educational technology can be used even in a noisy classroom.

#### **For students with speech disabilities**

Speech-to-text software and word prediction tools can assist students with these disabilities in communicating with their teachers and their classmates. These software allows students to speak into a microphone and have their speech converted into text on the computer.

#### **For students with learning disabilities**

Instructional Elements such as memory aids, audio books and text-to-speech systems are helpful especially for students who need assistance with learning, attention and organization. The students can have text read out loud and broken into syllables even in other languages.

#### **For students who need mobility assistance**

The all software and apps which they have been mentioned in section are the way which teachers can optimize their classrooms students by mobility disabilities. Also the students who they aren't physically able to use a keyboard or computer mouse can use inter touch-screen monitors (Igbo et al., 2014:1, Alvarado-Alcantar et al., 2020:201, Ikechukwu et al., 2020:1).

### **Method and Results**

Academic success process has been influenced by various factors through virtual educational system. On the other hand, there is availability of online classes that it allows students to move through degrees requirement more quickly. In the present study, the effect of two different virtual educational systems on students learning has been compared. This experimental study has been done and evaluated 384 male and female university students of Islamic Azad University, West Tehran Branch. A comparison of the satisfaction and efficiency of two virtual systems, Adobe Connect (System<sub>1</sub>) and Daan (System<sub>2</sub>), through training and learning process have been investigated

Fig. 1 shows the satisfactions percentage (SP) of students of system1 which it ranged from 0 to 100. The mean value of satisfactions is evaluated 49.9.

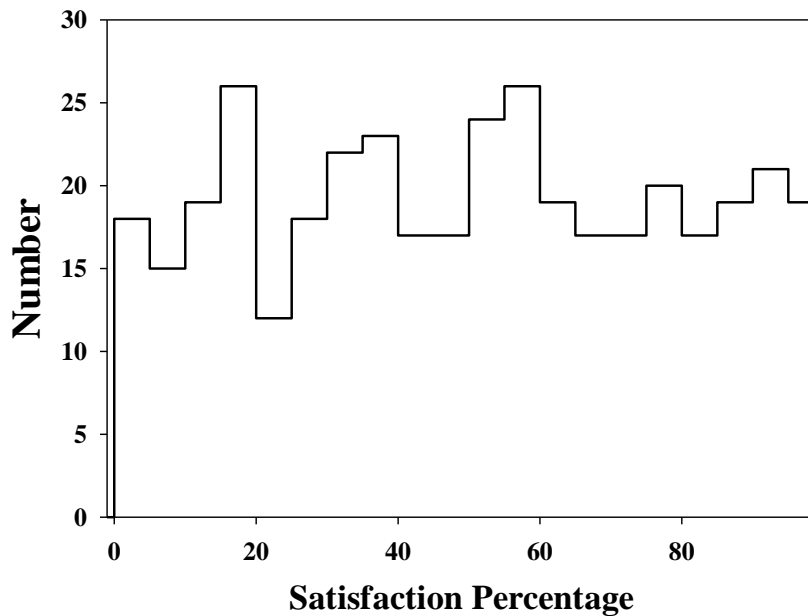


Figure (1): The histogram plot of satisfaction percentage of system

Table 1, present the descriptive statistics of learning satisfaction of System<sub>1</sub>. The standard deviation has been measured the dispersion of the set values relative to its mean and is calculated as the square root of the variance:

$$\text{Std.deviation} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \quad (1)$$

X<sub>i</sub>=value of the i<sup>th</sup> point in the data set

$\bar{x}$  =the mean value of the data set

n= the number of the data points in the data set

The standard deviation is calculated as the square root of variance by determining each data point's deviation relative to the mean (Xie et al., 2020:710).

Table (1): Descriptive statistics of learning satisfaction of system<sub>1</sub>.

Minimum	Maximum	Mean	Std.deviation	Kurtosis	Skewness
0	100	49.9	28.45	3.90	-1.00

Furthermore, the skewness and kurtosis of the satisfactions percentage have been evaluated. Skewness essentially measures the symmetry of the distribution, while kurtosis determines the heaviness of the distribution tails:

$$\text{Sk} = \frac{\langle (x - \bar{x})^3 \rangle}{\langle (x - \bar{x})^2 \rangle^{3/2}} \quad , \quad (2)$$

In statistics, skewness is a degree of asymmetry observed in a probability distribution that deviates from the symmetrical normal distribution in a given set of data. The normal distribution helps to know skewness. The symmetrical distribution has zero skewness as all measures of a central tendency lies in the middle. In statistics, negatively skewed distribution refers to the distribution model where more values are plots on the right side of the graph, and the tail of the distribution is spreading on the left side. The Fig.2, show the skewness of the data set of system<sub>1</sub>. In negatively skewed, the mean of the data is less than the median (a large number of data-pushed on the left-hand side). Negatively Skewed Distribution is a type of distribution where the mean, median, and mode of the distribution are negative rather than positive or zero (Briggs, 2012). Also, the probability density distribution curve of the data set P(SP) has been shown as a function of (SP-Mean), in Fig. 2.

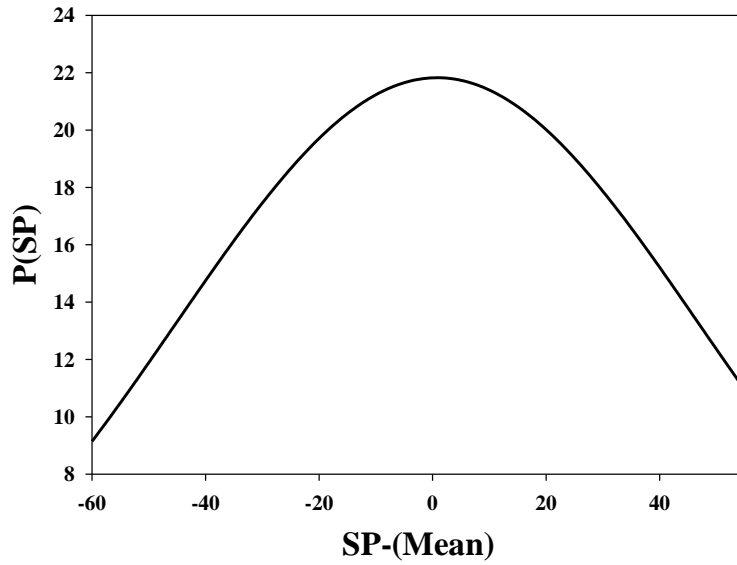


Figure (2): The normalized data distribution of system<sub>1</sub>.

Kurtosis is a statistical measure, whether the data is heavy-tailed or light-tailed in a normal distribution. The excess kurtosis is used in statistics and probability theory to compare the kurtosis coefficient (Briggs, 2012)

$$Ku = \frac{\langle (x - \bar{x})^4 \rangle}{\langle (x - \bar{x})^2 \rangle^2}, \quad (3)$$

Based on the table 1, the kurtosis  $> 3$ , positive values of kurtosis indicate that distribution is peaked and possesses thick tails. An extreme positive kurtosis indicates a distribution where more of the numbers are located in the tails of the distribution instead of around the mean.

Fig. 3 shows the satisfactions percentage (SP) of students of system<sub>2</sub> which it ranged from 0 to 100. The mean value of satisfactions is evaluated 47.8.

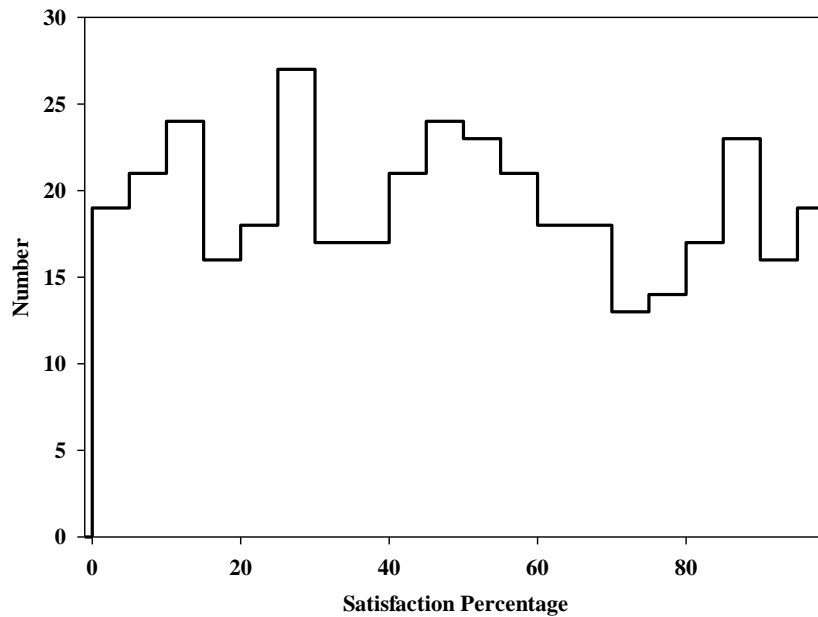
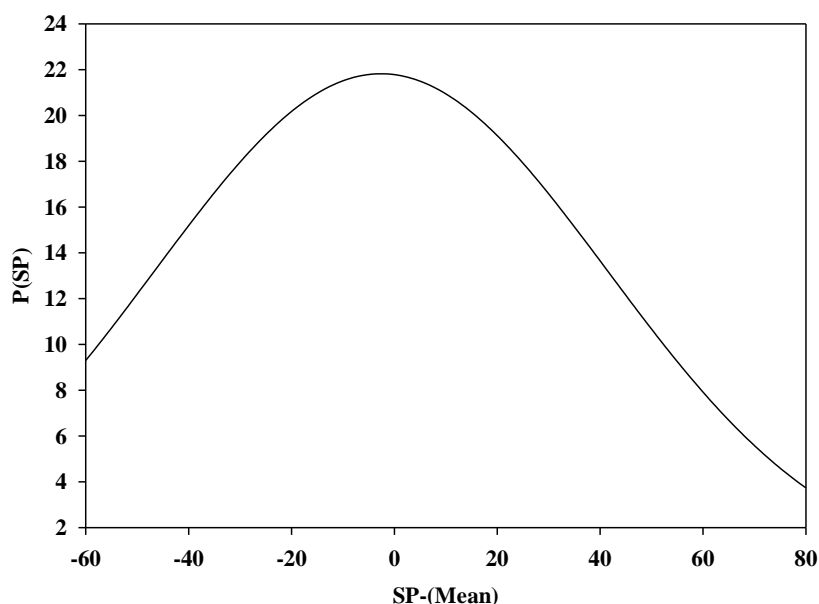


Figure (3): The histogram plot of satisfaction percentage of system<sub>2</sub>.

The descriptive statistics of learning satisfaction for system<sub>2</sub> have been shown in Table 2. It has a lower mean value of satisfaction in comparison of system<sub>1</sub>.

*Table (2): Descriptive statistics of learning satisfaction of system<sub>2</sub>.*

Minimum	Maximum	Mean	Std.deviation	Kurtosis	Skewness
0	100	47.8	28.67	2.14	0.99



*Figure (4): The normalized data distribution of system<sub>2</sub>.*

In positively skewed, the mean of the data is greater than the median (a large number of data-pushed on the right-hand side). In other words, the results are bent towards the lower side. The mean will be more than the median as the median is the middle value and mode is always the highest value. Based on Table.2, kurtosis < 3 and it having a lower tail and stretched around center tails means most of the data points are present in high proximity with mean. The kurtosis = 3 is the same as the normal distribution. There is a helpful option in system<sub>2</sub> which the teachers can survey on the different subjects from the student through the education. It is worthy to note that, two systems have the ability to control the participation of students in the virtual class.

### Conclusion and Remarks

This study helps developing the education in implementing and preparing strategies for remote learning and teaching. There are various programs which simplify the student learning and help them to attain more skills. The role and benefits of using the novel technology for improvement the educational system have been discussed. The effect of technology in education, how should technology be used for teaching and learning, and the most common queries have been explained for 384 male and female bachelor university students of Islamic Azad University, West Tehran Branch. Also, the examples of Instructional Elements and Educational Technology in the classroom have been mentioned. The system<sub>2</sub> has the bigger mean value of satisfaction percentage than system<sub>1</sub>. Furthermore, the studies show that with educational and assistive technology, the teachers can create more inclusive classrooms and empower students with system<sub>2</sub> to participate in the general education curriculum.

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