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Validation of a Blended Teaching model from the Perspective of Engineering Students in Islamic Azad University During the COVID-19 Pandemic

MORADI, Fateme

(1) 0000-0001-9609-9057 Department of mathematic, Yadegar-e-Imam Khomeini (RAH) Shahre Rey Branch, Islamic Azad University, Tehran, Iran.. dr.fateme.moradi@gmail.com

A B S T R A C T

The statistical population included all undergraduate students of engineering fields of Islamic Azad University, Shahreri branch, in the second semester of 2021-2022; overall, there were 201 male and female engineering 201 students who were randomly selected. The questionnaire was completed online by students after explaining the research objectives and attracting the participants. After collecting data, SPSS 26 and Smart PLS software were used for analysis
The results showed that the effective factors of face-to-face teaching were: the role of teacher, content and resources, teaching materials, growth and development, the role of family, learning strategies, evaluation, educational goals fulfillment, instruction space and time. The effective factors of virtual education were as follows: the role of teacher, content and resources, educational materials, the role of family, growth and development, information technology, learning strategies, learning time, educational goals fulfillment, evaluation and learning space. On the other hand, the results showed that face-to-face and virtual teaching confirmed and emphasized the need for blended teaching. In other words, blended teaching can be included for better effectiveness in virtual and face-to-face teaching.

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RESUMO

A população estatística incluiu todos os alunos de graduação em engenharia da Islamic Azad University, filial Shahreri, no segundo semestre de 2021-2022; no geral, havia 201 alunos de engenharia do sexo masculino e feminino que foram selecionados aleatoriamente. O questionário foi preenchido online pelos alunos após explicar os objetivos da pesquisa e atrair os participantes. Após a coleta de dados, o software SPSS 26 e Smart PLS foram usados para análise. Os resultados mostraram que os fatores efetivos do ensino presencial foram: o papel do professor, conteúdo e recursos, materiais didáticos, crescimento e desenvolvimento, o papel da família, estratégias de aprendizagem, avaliação, cumprimento de metas educacionais, espaço e tempo de instrução. Os fatores efetivos da educação virtual foram os seguintes: o papel do professor, conteúdo e recursos, materiais educacionais, o papel da família, crescimento e desenvolvimento, tecnologia da informação, estratégias de aprendizagem, tempo de aprendizagem, cumprimento de metas educacionais, avaliação e espaço de aprendizagem. Por outro lado, os resultados mostraram que o ensino presencial e virtual confirmou e enfatizou a necessidade do ensino combinado. Em outras palavras, o ensino combinado pode ser incluído para melhor eficácia no ensino virtual e presencial.

Keywords:
Ensino virtual,
Ensino presencial,
Ensino misto,
Eficacia.

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Introduction

Private schools and institutions, universities, and higher education centers work towards advancement and excellence in their mission and goals; they lead the educated strata of society on a larger scale (Arya, 2006).

Since the end of December, 2019, the world has faced a huge challenge called the new corona virus (COVID19), which has resulted in challenging the economic, industrial, health system, education and closure systems. Therefore, the COVID challenge has caused the closure of face-to-face education in the educational centers, turning in to a serious concern among parents, teachers and professors (Peyronnet et al,2020). One of the problems predicted in the global education system (using the Internet, etc.) is how to ensure that the best kind of education is available to anyone who seeks for it in any situation (such as the COVID-2019 Pandemic, earthquake, etc.), Is it possible to provide different types of instruction for a large number of people and finally, what will be the costs in such instruction? (Najar Ajampour, 2017)

Information technology has the power to function and give a positive response to each of these problems. One of the strategies to make the educational subject widely available to users with this method is distance education or electronic learning. E-learning has different meanings and people in different roles have different perceptions of it; in general, the term e-learning encompasses a wide range of processes and applications (Safa &Shaban Ali, 2006).

However, one of the most comprehensive and concise definitions that can be obtained by considering all views on e-learning is the one the American Association for Education and Development has provided; so, e-learning can be defined as a wide range of applications and processes, including: web-based education computers, virtual classrooms, and digital collaboration (Derwin, 2005),

Distance learning or electro-learning is as an educational method that first started as a necessity to remove climatic and geographical barriers of educational spaces, as well as age and gender restrictions of learners; then, as an educational system, it was developed, promoting philosophy and specific goals in learning theories based on the evolved theories of specialists (Talibzadeh &Hosseini,2007).

The objectives of distance education (Pishgaman Institute) are: implementation of all or part of the educational programs approved by the Ministry of Education (flexibility in providing educational methods and its implementation). Distance education acts to make up for lost educational opportunities such as: (Earthquake, CoVID-19 Pandemic) by using new theories and practices of educators around the world which would be too costly to access. In

the face-to-face method, learners, as done usually in the classroom during teaching, in case there were any ambiguity or questions from the teacher at the end and before the exam, would provide a brief summary of the course and answer the learners' final questions. Then a post-test would be taken by learners. The test was in pen and paper, with each learner taking the test individually.

This type of education, despite its many advantages, due to its high cost and the need for more manpower, made learners passive in teaching process, thus creating limitations for the public education. The monotony and lack of the initiative of teachers in the teaching methods, especially in mathematics, can be considered as one of the reasons for students' academic failure in mathematics. Most students are interested in learning a variety of enjoyable subjects and questions in a wide range of learning environments. (Garrison, 2004). Another shortcoming of face-to-face classes is the passivity of students and the lack of access to rich information resources and the one-sidedness of teaching (especially in lectures). Most of the learning taking place in these classes is unstable. The most important reason that students are passive in the vast majority of classes. Utilizing the possibilities of new learning methods and advanced information and communication technology, in addition to involving learners in various electronic learning environments, could foster a research-oriented spirit and the power of creative thinking in them.

Because students interact in virtual environments, unlike face-to-face classes, by doing a variety of tasks in e-learning environments, especially when problem solving is successful, they are more motivated to solve more complex exercises and tasks. In this case, the efforts are more and further success also increases their thinking power (Victorja & Dosan, 2007). Blending learning refers to the thoughtful integration of e-learning and face-to-face learning (Garrison &Vagina 2007). Terms such as hybrid learning or combined learning are also used instead of blended learning (Yarasmo, 2010). The underlying philosophy of blended learning is that not everyone learns in the same way; therefore, it is necessary to use different methods for learning (Carmen 2002 and Rosenberg 2001).

This form of learning has been defined as a combination of various forms of learning enhancement technology with face-to-face and instructor-centered teaching (Souzani, 2003). Blended learning is defined as a combination of traditional and conversational classrooms with new technologies such as multimedia, CD-ROM, virtual classrooms, email and video conferencing. Blended learning in higher education provides a vision and a roadmap for higher education teachers to make the possibilities of organic combination of face-to-face and online learning more attractive and meaningful for learners (Yagcioglu, 2017).

Blended learning makes it possible to use technology to expand the physical boundaries of the classroom, to provide access to content and learning resources, and to improve the ability

of instructors to receive feedback on the progress of learners, thus better fulfilling the goals of courses.

Learners can improve in a self-taught manner and even repeat parts of the instructional program again (Barsin, 2004; Roset ;Frouze, 2006 and Zangro-Johlin, 2001). Increasing survival (maintenance) and improving learning effectiveness are other benefits of blended learning that have been proved through empirical studies (Bersin, 2004). Other advantages of blended learning include: lower costs (Driscoll, 2002; Benco& Graha, 2006 and Graham, 2009), improved education (Graham, 2006; Donnelly, 2006) and increased interactions (Neco, Graham, 2006; Graham, 2006; Huang, Husu, Tretiakov, Chi &Lee 2009 and Deliyalujolu &Yildirim 2007); it is because of these characteristics that blended learning is growing rapidly both in the fields of industry and education. In line with the above research, some studies have been done:

Musawi & Ammar (2021) in a study, titled "The effect of different levels of the combination of traditional and electronic education on academic achievement and students' attitudes toward blended learning at Sultan Qaboos University" showed that blending learning in education could be recommended for the development different learning variables such as perception and thinking.

Conklin et al (2019) in a research, titled "Graduate students' perception of interactions in a blended learning environment: A case study", examined quantitative research on students' experiences in combined learning environments, especially in terms of teacher-student and student-student interactions. They concluded that students preferred to interact with the instructor over their peers. In addition, students were able to connect more with their peers in blended learning environments.

Yurniwati & Yarmi (2020) also in a study on promoting the conceptual knowledge of future teachers through web-based blended learning showed that Indonesian primary school students had difficulty with the concept of fractionation; to solve this problem, web-based blended learning was used to develop conceptual knowledge of students, concluding that web-based blended learning could be an effective learning system for developing the conceptual abilities of elementary students in regard to fractions.

Bozkurt & Sharma (2021) in a research titled "In pursuit of the right combination: Blended learning to increase, strengthen and enrich flexibility", investigated the theoretical and conceptual approach to combined learning, empowerment of educational technology with appropriate teaching and program development lessons to increase flexibility, thus exploring the expansion of educational boundaries.

Also, Cole (2020) in a study, titled "The effect of blended learning on student performance and participation in middle school language art class", showed that teaching methods in the blended learning approach increased students' understanding of seventh grade language arts. Blended learning outcomes were not only very rewarding for the students, but also made their work more enjoyable. Online education is preferred during COVID-19's illness over traditional education; however the latter is preferred to online education when COVID-disease is not present, because students feel limitations in online education.

From a policy point of view, by including social elements, we encourage online learning to enhance the students' experience, so that students can minimize their negative attitudes in the transition from traditional to online education.

Methodological Procedure

The above study investigates the question: What is the validity of the blended education model from the perspective of engineering students of Islamic Azad University during Covid-19 Pandemic?

Participants:

The statistical population included all undergraduate students of engineering fields of Islamic Azad University, Shahreri branch, in the second semester of 2021-2022; overall, there were 201 male and female engineering 201 students who were randomly selected. The research and questionnaire were fully explained to the students and they voluntarily participated in this research.

Data Collection and Analysis:

To examine the question of how the blended education model can be validated from the perspective of engineering students of Islamic Azad University during the period of Covid-19 disease,

A questionnaire showing the effectiveness of teaching in face-to-face and virtual methods on learning efficiency was used. For this purpose, two separate columns were set up and this questionnaire had 11 subscales (evaluation, learning environment, information technology, the role of family, teaching materials, goals fulfillment, the role of teacher, growth and development, content and resources, learning strategies and teaching time) which included 60 items.

Structural equation modeling using PLS software was used to test the accuracy of the theoretical model of the research and to calculate the impact coefficients..

Results and Discussion

Research model fit test

In this section, we examine the research model fit test using the PLS software

Figure 1.

Structural model of research with factor loading coefficients

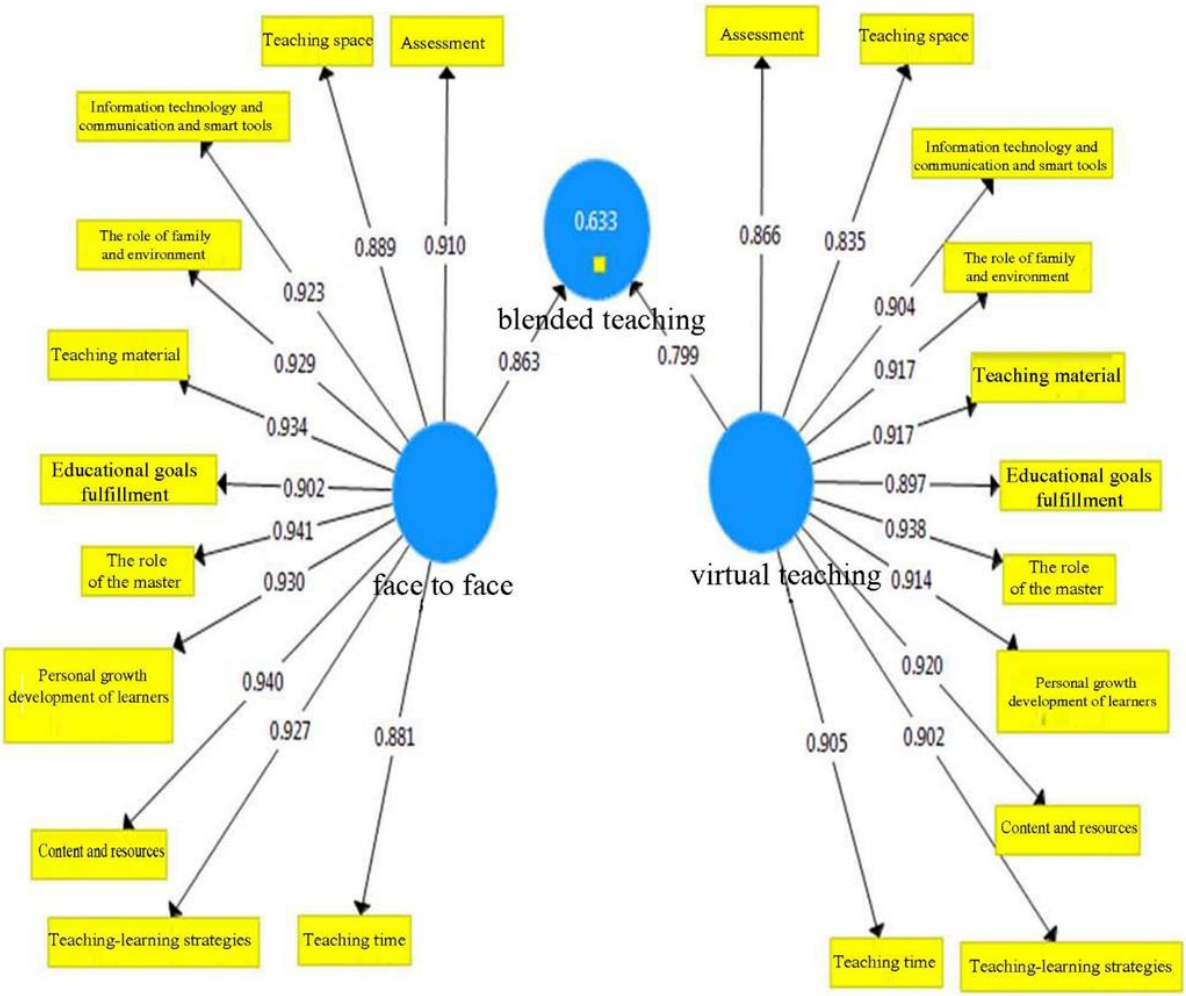
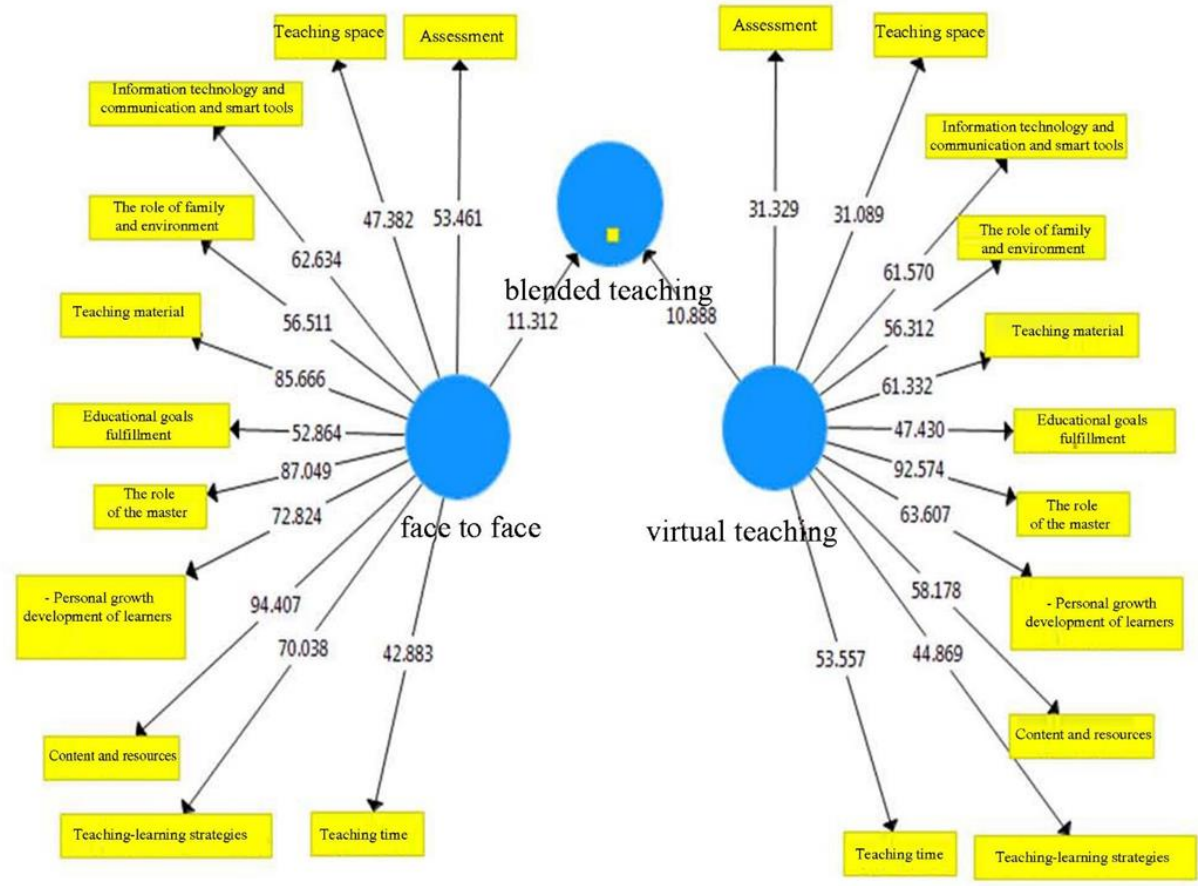


Figure 2.

Structural model of the research with significant coefficients



Reliability:

In order to evaluate the reliability of the research measurement model, we examined the factor loading coefficients, Cronbach's alpha coefficients and the combined reliability.

Measuring factor loadings:

Table 1.

Factor	Indicator	Factor Load	Factor	Indicator	Factor Load
Face-to-Face Education	Assessment	0.910	Virtual Education	Assessment	0.866
	Teaching-Learning Strategies	0.927		Teaching-Learning Strategies	0.902
	Personal Growth - Development of Learners	0.930		Personal Growth - Development of Learners	0.914
	Training Time	0.881		Training Time	0.905
	Training Space	0.889		Training Space	0.835

Factor	Indicator	Factor Load	Factor	Indicator	Factor Load
	Information and Communication Technology and Smart Tools	0.923		Information and Communication Technology and Smart Tools	0.904
	Content and Resources	0.940		Content and Resources	0.920
	Training Material	0.934		Training Material	0.917
	The Role of the Master	0.941		The Role of the Master	0.938
	The Role of Family and Environment	0.929		The Role of Family and Environment	0.917
	Achieving Educational Goals	0.902		Achieving Educational Goals	0.897

factor loading coefficients

The criterion for the suitability of the factor loading coefficients is 0.4. In the table above, all factor loading coefficients in the questions are greater than 0.4, thus indicating that this criterion is appropriate.

Cronbach's alpha, combined reliability:

According to the data analysis algorithm in PLS, after measuring the factor loading of the questions, it is time to calculate and report Cronbach's alpha coefficients and combined reliability, the results of which are shown in the table below.

Table 2.

Hidden Variables	Cronbach's Alpha Coefficient (Alpha > 0.7)	Combined Reliability Coefficient (CR > 0.7)
Face-to-Face Education	0.983	0.984
Virtual Education	0.877	0.980

Cronbach's alpha results and the combined reliability of latent research variables

Considering that the appropriate value for Cronbach's alpha and combined reliability is 0.7, according to the findings shown in the above table, these criteria have adopted a suitable value for latent variables, thus confirming that the reliability of the research is appropriate.

Two educational factors (face-to-face and virtual), as shown in table 1, that have indicators such as evaluation, learning strategies, learning time, learning space, information and communication technology and smart tools, content and resources, teaching materials, the role of teacher , the role of family and environment and educational goals fulfillment, have been investigated and compared. According to the above table, it can be said that indicators

such as evaluation index, learning strategies and teaching time make the biggest differences between face-to-face and virtual instruction factors.

According to the factor loads, as shown in Table 1, the effective factors of face-to-face teaching are as follows: the role of the teacher, content and resources, teaching materials, growth and development, the role of family, learning strategies, evaluation, educational goals fulfillment, learning environment and time. The effective factors of virtual education are as follows: the role of the teacher, content and resources, educational materials, the role of the family, growth and development, information technology, learning strategies, learning time, educational goals fulfillment, evaluation and learning space.

In face-to-face and virtual education, the role of the teacher is the most effective, while the time of teaching and the educational space are the least ones, as compared to factors such as learning strategies, growth and development, information technology, content and resources, educational materials, the role of family and goals fulfillment. On the other hand, it can be said that in both educational methods (face-to-face and virtual), the role of the teacher is the most influential factor in the field of education.

The results, as represented in Table 2, show that face-to-face and virtual teaching both emphasize the need for blended teaching. In other words, blended teaching can be included for better effectiveness of virtual and face-to-face teaching

Discussion and conclusion:

When the world is facing a huge challenge called corona virus, as a result, I the economic, industrial, health, and education systems have been challenged and even shut down in some cases. This has led to the closure of face-to-face learning in educational centers, schools, universities and language centers in Iran, causing much concern among parents and teachers.

This, thus, has doubled the necessity of using new technologies in education. It should be said that each method is evaluated and used according to the characteristics and changes that bring about in an educational system. Distance education, as an educational method, first began as a necessity to remove the climatic and geographical barriers of educational spaces, age and gender limitations of learners; then it was continued as an educational system, with its own philosophy, pursuing some special goals according to theories of learning based on the developed theories of experts and then following improvement (6.

When considering the position of content in distance education from the COVID-19 Pandemic onwards, in online education and learning, a new approach to modern education was created in the 21st century in which every student could stay home and still be educated by great masters from around the world.

In e-learning, we are faced with the concept of lifelong learning, such that learners are always learning in a virtual environment according to their interests and needs. Although e-learning has many positive points, there are many weaknesses as well.

Researchers believe that in virtual teaching during Covid -19 crisis, there have been some challenges such as unfamiliarity with virtual teaching and the problems of accurate evaluation of students. There are many other problems including incomplete learning. Incomplete learning is manifested in a variety of ways; the student may read a text but may not be able to interpret what he/she has read in his/ her mind.

As another effect of incomplete learning, due to the long-term effects of being away from university, abnormal and unproductive behaviors of from students are exacerbated in the early years of universities and educational centers. Students are present in the class, but they do not participate in educational activities. The books may be, more or less, opened, on the right, but not much effort is made to read them.

Students are careless in doing their homework. Due to long class breaks, many students have less practice writing. Due to lack of practice and incomplete learning, students do not fully understand the content of what they have worked on at school.

Another weakness of e-learning is the reduction of learners' social relationships and the separation of learners from teachers. Thus, another type of learning called blended learning was developed; blended learning is a combination of face-to-face learning and online one to overcome the weaknesses of e-learning (Allen et al. 2009).

This approach is used to design teaching and learning opportunities, considering the advantages of the blended learning approach in gaining students' satisfaction and fostering learning. Blended learning courses in organizations allow employees to make the best use of their time, and employees can pursue part of the teaching asynchronously, at any time and place (Overton, 2004).

On the other hand, providing different opportunities for self-learning makes it possible to increase the attractiveness of education, as well paying due attention to individual differences.

In addition, as stated by most of the managers interviewed in this regard, blended learning, along with enhancing instruction effectiveness, can be prioritized in terms of financial issues and costs in organizations.

Blended teaching changes the educational approach from a teacher-centered one to a learner-centered one, calling for more participation of learners in discussion and finally, enhancing the quality of education.

According to the above discussion, we can conclude that the blended learning course uses a combination of high software features and the comprehensiveness of e-learning. In this way, the interaction between learners is used to benefit from the teacher's experiences, as well as the implementation of group research in face-to-face learning.

By using powerful instructional content, learning is realized with better quality than instruction in classrooms with low facilities. By understanding the superiority of face-to-face contact and real meetings of learners and teachers, as compared to contacts and communications in the virtual environment, face-to-face classes are applied as well.

In this way, the number of face-to-face sessions is significantly reduced (less than half) when compared to face-to-face teaching alone. Therefore, this learning method will effectively increase students' learning efficiency by eliminating the weaknesses of face-to-face teaching and e-learning.

The purpose of this study was to validate the blended teaching model from the perspective of the engineering students of Islamic Azad University during Covid-19 disease. For this purpose, a valid questionnaire was used and this questionnaire was completed by 201 male and female engineering students who were randomly selected. The obtained data were analyzed using SPSS26 and Smart PLS. The results showed that the effective factors of face-to-face training were as follows: the role of the teacher, content and resources, teaching materials, growth and development, the role of family, learning strategies, evaluation, educational goals fulfillment, learning space and learning time.

On the other hand, the effective factors of virtual education were as follows: the role of the teacher, content and resources, educational materials, the role of family, growth and development, information technology, learning strategies, learning time, educational goals fulfillment, evaluation, and learning space. In both face-to-face and virtual education, the role of the teacher had the highest effectiveness, while the time of teaching and the educational space had the least significant role, as compared to factors such as learning strategies, growth and development, information technology, content and resources, educational materials, the role of family and goals fulfillment.

From the above results, it is inferred that in these two educational methods, the role of the teacher plays a very effective and significant role. In other words, in order to adopt a new educational method, the role of the teacher must be prioritized. Therefore, blended teaching should be done by professors who have both virtual and face-to-face training experience.

In addition, teaching time is the least effective factor in face-to-face teaching. It can be argued that students need to learn that the time of their learning depends on their position and social activities and they do not need a specific time for learning. It can also be said that in

virtual education, the educational space is the least effective factor, as compared to other educational items, i.e. students do not need a special educational space for teaching. In other words, they just need to be connected to the relevant class or be able to review the recorded tutorial or attend the class.

In addition, the results showed that face-to-face teaching and virtual instruction emphasize the need for blended teaching.

In other words, for the better effectiveness of virtual and face-to-face teaching, blended teaching can be included. Because the simultaneous and asynchronous connection and collaboration can be realized through blended learning plans, a transformation can occur in teaching and learning in higher education. Blended learning, in fact, becomes a catalyst for traditional rethinking.

Technology is an integrated platform that seamlessly connects the real and virtual learning worlds. Much has been done to change the attitudes and expectations of current higher education students. They are often referred to as the next generation. As a result, it can be said that students who learn their subjects with blended teaching approaches can be more talkative and active in their real class hours, as they have different opportunities to repeat their reasons through online activities or online discussion groups (Ozlem Yagcioglu,2017)

Blended teaching goes beyond reinforcing traditional classroom lectures. Reaching the threshold of blended learning means replacing aspects of face-to-face learning with appropriate online learning experiences, such as labs, simulations, tutorials, and assessments. Blended learning represents a new approach and a combination of classroom and online activities that are tailored to the objectives of specific courses or programs (Ozlem Yagcioglu, 2017). According to blended teaching approach to teaching, the teacher plays a more passive role in the educational process, while students play a more active one in the purposeful learning activities by designing and driving their teacher (Pierce, 2017, p.1-3). While students perform precise learning exercises they are supposed to focus on in terms of standard skills, the teacher has more freedom to help students because they use online platforms and / or work with the target groups of students in small groups. This research is in line with studies such as (Musawi, & Ammar, 2021), (Yurniwati. & Yarmi, 2020), (Conklin, S et al, (2019), (Bozkur & Sharma, 2021) & (Cole.2020).

It is suggested to use these courses more in different educational levels, especially higher educational ones, in order to boost students' social skills (speech, etc.), while saving facilities and manpower. Given the age of information and new technologies, it is recommended that high-speed Internet be provided to most parts of the country, especially areas with limited facilities, to provide the basis for blended learning courses as well as

electronic courses. To implement the blended learning courses, it is also recommended to focus on human resources training, especially teachers, in designing e-learning environments; so, this should be on the agenda of the relevant ministry; this is because without skilled manpower when using information and communication technology, the implementation of such projects in the country with will fail.

REFERENCES

Al Musawi, A. S., & Ammar, M. E. (2021). The Effect of Different Blending Levels of Traditional and E-Learning Delivery on Academic Achievement and Students' Attitudes towards Blended Learning at Sultan Qaboos University. *Turkish Online Journal of Educational Technology-TOJET*, *20*(2), 127-139.

Conklin, S,.Trespalacios, J.,& Lowenthal, P.(2019). Graduate Students' Perceptions of Interactions in a Blended Synchronous Learning Environment: A Case Study. *Quarterly Review of Distance Education*, 20(4), 45-59 https://doi.org/10.18122/B23M3W

Allen, I. E., Seaman, J., & Garrett, R. (2007). *Blending in: The extent and promise of blended education in the United States*. Sloan Consortium. PO Box 1238, Newburyport, MA 01950.

AlNajdi, S. (2014, March). Hybrid learning in higher education. In *Society for Information Technology & Teacher Education International Conference* (pp. 214-220). Association for the Advancement of Computing in Education (AACE).

Arya, P. P. (Ed.). (2006). *Higher Education and Global Challenges: Systems and Opportunities*. Deep and Deep Publications.

Bersin, J. (2004). *The blended learning book: Best practices, proven methodologies, and lessons learned*. John Wiley & Sons.

Bonk C. J., & Graham, C. R. (2006). *Handbook of blended learning: Global perspectives, local designs*. San Francisco, CA: Pfeiffer publishing

Bozkurt,A,.& Sharma,SH.(2021). In Pursuit of the Right Mix: Blended Learning for Augmenting, Enhancing, and Enriching Flexibility. *Asian Journal of Distance Education*,16(2),1-7

Cole,C. (2020). *Blended Learning's Impact on Student Performance and Engagement in a Middle School Language* Arts Classroom. Master's Theses, 1-37

Carman, J. M. (2005). Blended learning design: Five key ingredients. *Agilant Learning*, *1*(11), 1-10.

Delialioglu, O.,& yildirim, Z. (2007). Student's perception on effective dimensions of interactive learning in a blended learning environment. *Journal of Education Technology & Society*, 10(2),133-146

Derouin, R. E., Fritzsche, B. A., & Salas, E. (2005). E-learning in organizations. *Journal of management*, *31*(6), 920-940. https://doi.org/10.1177/0149206305279815

Donnelly, R. (2006). Blended problem-based learning for teacher education: lessons learnt. *Journal of Learning, Media and Technology*. 31(2), 93-116. https://doi.org/10.1080/17439880600756621

Viktorija , S., &Dušan , L.(2007). UP Faculty of management Koper, *Blended learning and study effectiveness*

Driscoll, M. (2010). *Web-based training: Creating e-learning experiences*. John Wiley & Sons.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The internet and higher education*, *7*(2), 95-105. https://doi.org/10.1016/j.iheduc.2004.02.001

Garrison, R. D., & Vaughan, N. D. (2007). *Blended learning in higher education:Framework principles, and guidelines*. SanFrancisco, CA: Jossey-Bass

Graham, C. R. (2009). Blended learning models. In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 375-382). IGI Global. DOI: 10.4018/978-1-60566-026-4.ch063

Hwang, W.-Y., Hsu, J.-L., Tretiakov, A., Chou, H.-W., & Lee, C.-Y.(2009). Intra-action, Interaction and Outeraction in blended learning environments. *Educational Technology & Society*, 12(2), 222-239.

Mali, D., & Lim, H. (2021). How do students perceive face-to-face/blended learning as a result of the Covid-19 pandemic?. *The International Journal of Management Education*, *19*(3), 100552 https://doi.org/10.1016/j.ijme.2021.100552

Najar Ajampour, F(2017). *The role of globalization in communication and culture*. Mohageg ardebili publication.[Persian]

Overton, L. (2004). Linking learning to business. *Bizmedia. Available: http://www. elearningage. co. uk*.

Peyronnet, V., Sibiude, J., Deruelle, P., Huissoud, C., Lescure, X., Lucet, J. C., ... & Picone, O. (2020). Infection par le SARS-CoV-2 chez les femmes enceintes: état des connaissances et proposition de prise en charge par CNGOF. *Gynécologie obstétrique fertilité & sénologie*, *48*(5), 436-443.

Pierce, D. (2017). What effective blended learning looks like. *The Journal*, *44*(1), 18-20.

Rossett, A., & Frazee, R. V. (2006). Blended learning opportunities. *AMA Real Estate: AMA Special Report*, 1-27.

Safa, L & Shabanali, F.,& Hossein,A (2008). *People-Process-Output Chain in Education Electronics: p3 electronic model,* collection of articles of the first electronic learning conference, Zanjan University, 142-159

Sugrue, B. (2003). State of the industry: ASTD's annual review of US and international trends in workplace learning and performance. *Alexandria, VA: ASTD*.

Talibzadeh, M.., & Hosseini,A, S.(2007). Distance Education: A New Approach in Iranian Education, A Study of the Effectiveness of Distance Learning Centers and Their Educational and Teaching Programs in the Secondary School of the 85-84 Academic Year of the whole country. *Educational Innovation*, 6 (1), 73-92. [Persian]

Yagcioglu,O.(2017). Increasing the power of humor and creativity in ELT class, *Social and Emotional earning In EFLClasses*, 5(9), 83-90

Yagcioglu,O.(2017).Blended learning higher education frame work, principal and quid lines. *European journal of education studies*, 3(5), 1-17

Yerasimou, T. (2010). *Examining interactivity and flow in a blended course to advance blended learning practices* (Doctoral dissertation, Indiana University).

Yurniwati,Y.,& Yarmi,G.(2020). Promoting prospective teachers' conceptual knowledge through web-based blended learning. *Journal of Research and Advances in Mathematics Education*, 5(2), 187-201

Zenger.A., & Uehlei. C. (2001). Why blended will win**.** *Journal of Training & developmen*t. 55(2), 54-59