International Journal of Assessment Tools in Education
2021, Vol. 8, No. 1, 1–8
https://doi.org/10.21449/ijate.854675
Published at https://ijate.net/ https://dergipark.org.tr/en/pub/ijate *Research Article*

Analysis of Students Satisfaction with Virtual Education in Medical Science University during the Pandemic Outbreak of COVID-19

Freshteh Osmani [1,*]

[1]Infectious Disease Research center, Birjand University of Medical Sciences, Birjand, Iran

ARTICLE HISTORY
Received: Oct. 26, 2020
Revised: Dec. 17, 2020
Accepted: Jan. 05, 2020

Keywords:
Distance learning,
Online learning,
Virtual education,
COVID-19,
Students.

Abstract: Nowadays, owning to the failure of the Traditional Educational System, the only option left is the Virtual Educational, which will change the educational system at 180 degrees. The aim of this study was to investigate and evaluate the relationship between different factors associated with the level of satisfaction amongst students of Medical Science University during the pandemic outbreak of COVID-19. This cross-sectional study was performed among students of Birjand University of Medical Sciences in 2020. They completed the questionnaire was created using a Google platform and their answers was collected online. Satisfaction towards virtual educational learning plus total evaluation scores for various dimension of questionnaire was analyzed. A total of 320 out of 2700 students participated in the study voluntarily. Students' satisfaction with blended method in teaching style was higher and significant than two separate styles (p<0.05), but there was no significant relationship between satisfaction level and some demographic characteristics. Also, the majority of participants (41.7%) have a medium level of Satisfaction. There was significant relationship between the amount of computer skills, Semester and sex with overall satisfaction (p<0.05). Students demonstrated a moderate satisfaction and positive attitude towards VR educational system which comprises of a "Virtual Learning Room" at home for both the teacher and student. To be able to implement education in medical universities in the coronavirus crisis, electronic and internet infrastructures need to be completed quickly, and officials should take steps to empower students and teachers to take advantage of this opportunity.

1. INTRODUCTION

As the coronavirus (COVID-19) pandemic becomes widespread, medical science universities have suspended all classes with the hopes of mitigating viral transmission. The mechanism of spreading the virus is mainly dependent on direct contact and airborne droplets, even from asymptomatic carriers, and the rate of transmission is highly increased in crowded places such

CONTACT: Freshteh Osmani dr.osmani68@gmail.com Dentistry Clinical Research Development Center, Birjand University of Medical Sciences, Birjand, Iran

ISSN-e: 2148-7456 /© IJATE 2021

as universities. Accordingly, Organization such as UNESCO†- OHCHR‡- IFRC§ and WHO** urged countries to provide well-prepared, adaptable and accessible education settings that would be to all universities following closures during this pandemic(Chiao et al., 2018; Wilbur, 2016).

So, for more than 850 million students worldwide, disrupting the original teaching plans of universities. Soon later, many countries started to offer online teaching to students. While the corona virus quickly circulating in many countries, they had required decisive and drastic steps to avert an overflowing-blown contagion that evaluating: teaching, education content, participants' attitude towards to the course and its difficulty, students' perception and final judgment). Answers were presented on a Likert scale. In the present study, Cronbach's alpha coefficient of the questionnaire was obtained 0.83. This questionnaire was given to 7 experts in the field of medical education and after the final review, the final questionnaire with a validity of 0.78 was approved. As the participants were completed all the questions, the returned electronic forms were saved.

2. METHOD

2.1. Statistical analysis

All statistical methods were performed by using SPSS software version 23. Quantitative data were presented as mean ±SD and qualitative ones reported as frequency and percent. To analyze, due to normal distribution, Chi-square and Pearson correlation tests were used to identify the relationships in qualitative and quantitative variables, respectively. The statistical significance level was set at $p < .05$.

The present study was approved by the Ethics Committee of Birjand University of Medical Sciences (Ethical codes: IR.BUMS.REC.REC.1399.256).

3. RESULT

Three hundred and twenty students (28.9% male and 71% female) with a mean age of 21.17 ± 1.37 years (ranging from 19 to 29 years) participated in the study.

The percentages of subjects at the different grades were as follows: Bachelor students= 30.8%, Master students = 10.4%, Medical students = 39.1%, and PhD students = 17.2%. The majority of participants had basic (53.2%) and intermediate (47.5%) computer skills and whilst only 7.6% of them lacked any experience (Table 1).

Table 1. *Distribution of Demographic Character of participants.*

Variable	Mean+SD	N (%)
Age (y)	20.95 ± 1.65	
sex	male	93(28.9)
	female	227 (71)
Computer skills	Basic	170(53.2)
	Intermediate	152(47.5)
	Advanced	24 (7.6)
Grade	Bachelor	99(30.8)
	Master	33(10.4)

†-United Nations Educational, Scientific and Cultural Organization
‡-Office of the United Nations High Commissioner for Human Rights
§-International Federation of the Red Cross and Red Crescent Societies-
**-World Health Organization

Table 1. *Continues.*

	Medicine	125(39.1)
	PhD	24(7.6)
Having Practical lesson	Yes	231(72.4)
	No	(88(27.6)
Faculty	Health	55(17.2)
	Paramedical	48(15.1)
	medical	88(27.5)
	Dentistry	74(23.2)
	Nursing and Midwifery	67(21)
Semester	2^{th}	55(17.2)
	4^{th}	74(23)
	6^{th}	68(21.3)
	8^{th}	53(16.5)
	10^{th}	43(13.3)
	12^{th}	20(6.2)
GPA	18-20	151(47.2)
	16-18	124(38.6)
	<16	45(14)

The percentages of subjects at the different grades were as follows: Bachelor students= 30.8%, Master students = 10.4%, Medical students = 39.1%, and PhD students = 17.2%. The majority of participants had basic (53.2%) and intermediate (47.5%) computer skills and whilst only 7.6% of them lacked any experience (Table 1).

Table 2. *Distribution of students' total satisfaction with virtual education system.*

Total satisfaction level	Frequency (%)
Not at all	41(13.1)
low	61(19.3)
medium	135(42.2)
high	59(18.4)
Very high	22(6.8)

This results show that majority of students (42.2) % had a medium satisfaction level and only 6.8% of them were very satisfied with this management of virtual educational system (Table 2).

Table 3. *Correlation between satisfaction score and questionnaire dimensions.*

Satisfaction factors	Total satisfaction score	
	r	*p*
platform availability of system	0.32	0.032
Designed content	0.19	0.09
Interactive learning activities	0.61	<0.001
quality of service	0.29	0.047
Teacher evaluation	0.06	0.28

From the above analysis, we draw the conclusion that among the five major factors, designed content had no direct influence on user total satisfaction. Also, the above results show that, the influence index of user satisfaction mainly involved service quality. Users mainly hoped that the platform could meet their learning needs and provide necessary functions for learning; however, they did not have high expectations for the interface design of the platform (Table 3).

Table 4. *Relationship between satisfaction levels with demographic variables.*

Variable Satisfaction level		low	medium	high	χ^2 (*p*.value)
sex	Male	7.8%	12.2%	9%	13.79
	Female	18.9%	38.6%	14%	(0.04)
Computer skills	Basic	24.3	21.6	7.8	10.54
	Intermediate	9.2	27.9	8.5	(0.038)
	Advanced	-	3.4	4.2	
Grade	Bachelor	7.2	20.4	4	4.198
	Master	3.2	4.6	2.7	(0.241)
	Medicine	8.4	19.6	11.3	
	PhD		5.2	2.4	
Practical lesson	Yes	34.7	26	12.4	8.21
	No	8.3	13.5	6.4	(0.32)
Faculty	Health	3.6	10.4	3.8	5.946
	Paramedical	-	11.3	4.7	(0.114)
	medical	5.9	15.8	6.5	
	Dentistry	4.6	12.7	5.1	
	Nursing and Midwifery	1.3	17.1	2.6	
Semester	2^{th}	3.2	9.5	4.1	3.092
	4^{th}	2.8	17	3.2	(0.378)
	6^{th}	1.9	14.8	4.3	
	8^{th}	3.5	8.6	3.9	
	10^{th}	0.96	10.1	2.3	
	12^{th}	0.7	3.9	1.2	
GPA	18-20	9.3	22	16	
	16-18	12.4	18	8.5	9.27
	<16	4.8	7.9	1.3	(0.051)

According to the above analysis, we draw the conclusion that among all considered demographic variables, only characteristic including sex, Computer skills, Semester and GPA had a significantly relationship with satisfaction level (p<0.05) (Table 4)

4. DISCUSSION and CONCLUSION

In the coronavirus disease pandemic, educational system is no exception to undergo frequent occurred. Changing education is especially important. So, the education system needs comprehensive management and monitoring to maintain the best quality. The issuance of health guidelines for the observance of social distances necessitates a change in the educational systems. The crisis of COVID-19 pandemic has challenged the learning system too. In the face of the coronavirus disease crisis, creating a platform for virtual educational will create a new capacity for student education. In most countries, due to social distancing and closure of universities has prompted educators to teach in a virtual way and take online exams (Conroy et

al., 2008; González-Gómez et al., 2012). Education in the coronavirus pandemic entails a change in students' educational needs and educational systems. In order to achieve educational goals in medical sciences universities, measures must be taken to allocate limited resources to educational goals in the best way (Franz et al., 2015; Mahoney et al., 2016).

Thus, this study was designed to evaluate virtual educational performance by Student satisfaction evaluation amongst students in one of the medical sciences universities in Iran.

The results showed a significant difference in satisfaction with virtual educational in different teaching styles, so that blended method had more satisfaction than others, but there was no significant difference in satisfaction with online and offline-content among students.

Previous research has shown that the using online content in teaching as a non-synchronous e-learning tool has an effective role in satisfaction of students and helps them focus on content (Oliveira et al., 2017; Osmani et al., 2019). It is important to note that in a virtual learning environment, many factors including lecturers, courses, technology, system design and learning environments affect user satisfaction (Gholipour Mofrad Dashtaki et al., 2020; Moazami et al., 2014). As an example, the result of a study showed that while content is appropriate, factors such as problematic use, technical problems and lack of access to electronic equipment can be reasons for dissatisfaction with virtual education (Buşan, 2014). Several studies showed a moderate relationship between the strategy of using online content learning techniques and its satisfaction (Gholipour Mofrad Dashtaki et al., 2020). Also, another one has showed that the LMS method is better suited to support efficient learning (Franz et al., 2015). Another study has demonstrated that most students were very satisfied with the effect of using blended teaching methods (Bennett & Lockyer, 2004). In practical and skill-based discussions, it should be noted that training should be both virtual and in-person in order to achieve student satisfaction and optimal performance (Cohen & Davidovitch, 2020). On the other hand, various teaching styles are as notable educational concepts and the number of students and different kinds of educational content should be specified based on the teaching style (Donoghue, 2006; Kim & Bonk, 2006). Another result of this study showed that, designed content had no direct influence on user total satisfaction, indicating that users had a fair attitude. Instead, platform availability had a significance influence on user satisfaction. In terms of availability, the most important problems were: function design and operation of the online teaching platform. In terms of Interactive learning activities quality, the feedback for the homework assigned by teachers was the main effective factor (Viner et al., 2020). The influence of teacher evaluation quality on satisfaction of students was caused by matters such as timely response to problems and learning extension. The correlation between the overall Interactive activity's quality, Teacher evaluation quality, and designed content was not high, indicating that the influence on user satisfaction was not high (Anarinejad & Mohammadi, 2020).

In the current study, distribution of satisfaction level was almost similar in different faculty, so that, there was no significant difference between them. But in total, satisfaction in students of health faculty was more than others. It can be due to majority of students from this faculty are in bachelor grade without practical and clinical courses. A study indicated that participating in a virtual education course can improve attending students' attitudes towards virtual education in students with different learning styles (Ebadi & Heidaranlu, 2020; Setiawan, 2020).

In the present study, there was no difference in satisfaction score in the using of virtual education between different grades. Similarly, more participants in the current study were not satisfied with their VR experiences. Satisfaction and positive attitude towards VR education seem to be positively associated with gender, computer skills and previous experiences on VR. These results were consistent with a previous study (Zaharah et al., 2020).

In the present study, the majority were female and both genders were in medium level of satisfaction. In terms of gender, females showed higher satisfaction and a more positive attitude

than males towards virtual education, which is similar to other studies that females are more willing to virtual education. However, other studies have rejected the role of gender in relation to satisfaction with VR education. These differences may be due to difference in the assessment methods and even sample size (Akram et al., 2020; Cohen & Davidovitch, 2020).

Further, the satisfaction of 6th-semester students towards VR education and technical experience were significantly more than amongst their lower semester.

Lack of technical skills adversely affect the virtual educational learning process. Another study has shown that students' perception of virtual learning was related to the degree of essential computer skills and stable access to the Internet (Gholipour Mofrad Dashtaki et al., 2020). These results were in line with the result of our study. Computer skills potentially strengthen the connection between students and learning from VR education. Additionally, it enhances their proficiency in using various platforms and applications, most of the students considered social media to be unhelpful in the VR educational learning process, although it can be an effective tool in this era. Hence, the curriculum should be well-structured to ensure the effectiveness of these tools (Al-Taweel et al., 2020).

Previous studies have been reported conflicting results regarding satisfaction with VR educational learning, meanwhile some studies indicated a higher attrition rate for online courses than conventional one. This can be ascribed to overlapping in the timing of online lectures with personal daily activities (Chen et al., 2020).Generally, students' satisfaction with virtual programmers are influenced by multiple factors, like, quality of the course.35 Support of this concept was seen by students' need to improve the quality of the online lectures. Moreover, majority of them agreed with combining VR educational learning with classic classroom as the best method to attain the targets of the educational process. This result agrees with a previous published systematic review (Tanveer et al., 2020).

Evaluation of mean attitude of females towards VR education was significantly higher than male, which is consistent with results from a previous study which suggested that females are more teacher-oriented than males. Also, design and aesthetic presentation of the online material, and live interaction with the students are factors that positively affect the success of the online courses (Kim & Bonk, 2006; Osmani et al., 2018). Indeed, attitude towards virtual lecturers and it's quality are main factors in success of virtual education learning (Anarinejad & Mohammadi, 2020; Osmani & Hajizadeh, 2019).

This study, like other observational studies has limitations such as that only relationship with certain variables could be specified but not the cause-effect associations. Also, this study focused on evaluating user satisfaction for university students only. Therefore, the evaluation of other aspects of distant learning, such as interactive tutorials, webinars and online courses should be considered in the future studies.

Furthermore, the results of this study were compared to previous studies published in normal situations rather than a crisis period, which could have some bias, especially due to depression and anxiety related with the social restrictions.

This study collected students' experience data on virtual education platforms during the COVID-19 pandemic. Generally, the obtained results showed that majority of the participants feels that they are being adversely affected by VR education learning system in university. Also, a moderate level of satisfaction and positive attitude towards VR educational learning was observed. Although, COVID-19–associated events have caused to improve IT and computer skills amongst all users' members to prepare better for similar crises in the future.

We concluded that, if the situation prevails, drastically affect the teaching during fall, and even on the recurring semester 2021. It will be highly challenging to continue in-person class

sessions for both students and teachers. However, online teaching will also cost a lot in the shape of the internet and related facilities costs.

The next semester activities halted. No face to face interaction and universities closed for the time being. Shift to online classes with the help of virtual educational system. Assignments and open book exams may be used as an option. It would be highly challenging for teachers and students to shape back in the position of face to face learning. However, cost on internet use and related facilities shows an upward trajectory.

At last, we can use a strategic planning tool to meet the current challenges and to cope with any uncertain and risk situation in the future. Also, it is necessary to establish a dedicated center at the university that will work to cooperate internally and externally to decrease the line and virtual barriers.

Acknowledgments

We would like to thank all students participating in the study.

Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the author(s).

Authorship contribution statement

Freshteh Osmani: Investigation, Methodology, Visualization, Software, Formal Analysis, and Writing the original draft.

ORCID

Freshteh Osmani https://orcid.org/0000-0002-6112-7131

5. REFERENCES

Akram, W., Adeel, S., Tabassum, M., Jiang, Y., Chandio, A., & Yasmin, I. (2020). Scenario Analysis and Proposed Plan for Pakistan Universities–COVID–19: Application of Design Thinking Model.

Al-Taweel, F. B., Abdulkareem, A. A., Gul, S. S., & Alshami, M. L. (2020). Evaluation of technology-based learning by dental students during the pandemic outbreak of coronavirus disease 2019. *European Journal of Dental Education, 24(3), 81-89.*

Anarinejad, A., & Mohammadi, M. (2020). The practical indicators for evaluation of e-learning in higher education in Iran. *Interdisciplinary Journal of Virtual Learning in Medical Sciences, 5*(1), 11-25.

Bennett, S., & Lockyer, L. (2004). Becoming an online teacher: Adapting to a changed environment for teaching and learning in higher education. *Educational Media International, 41*(3), 231-248.

Buşan, A.-M. (2014). Learning styles of medical students-implications in education. *Current health sciences journal, 40*(2), 104.

Chen, T., Peng, L., Yin, X., Rong, J., Yang, J., & Cong, G. (2020). *Analysis of user satisfaction with online education platforms in China during the COVID-19 pandemic.* Paper presented at the Healthcare.

Chiao, H.-M., Chen, Y.-L., & Huang, W.-H. (2018). Examining the usability of an online virtual tour-guiding platform for cultural tourism education. *Journal of Hospitality, Leisure, Sport & Tourism Education, 23*, 29-38.

Cohen, E., & Davidovitch, N. (2020). The Development of Online Learning in Israeli Higher Education. *Journal of Education and Learning, 9*(5), 15.

Conroy, M., Durrheim, D. N., & Dalton, C. (2008). Likely impact of school and childcare closures on public health workforce during an influenza pandemic: a survey. *Communicable Diseases Intelligence Quarterly Report, 32*(2), 261.

Donoghue, S. L. (2006). Institutional potential for online learning: A Hong Kong case study. *Journal of Educational Technology & Society, 9*(4), 78-94.

Ebadi, A., & Heidaranlu, E. (2020). Virtual Learning: A New Experience in the Shadow of Coronavirus Disease. *Shiraz E-Medical Journal, 21(12), e106712.*

Franz, S., Behrends, M., Haack, C., & Marschollek, M. (2015). *Benefits and Barriers of E-Learning for Staff Training in a Medical University.* Paper presented at the ICIMTH.

Gholipour Mofrad Dashtaki, D., Mohammadi, A., Zolfaghari, M., Imani, S., & Tahmasebian, S. (2020). The Relationship of Satisfaction and Usage of Virtual Learning Facilities with Learning Style in Medical, Health, and Operating Room Students. *Strides in Development of Medical Education, 17*(1), 1-6.

González-Gómez, F., Guardiola, J., Rodríguez, Ó. M., & Alonso, M. Á. M. (2012). Gender differences in e-learning satisfaction. *Computers & Education, 58*(1), 283-290.

Kim, K.-J., & Bonk, C. J. (2006). The future of online teaching and learning in higher education. *Educause quarterly, 29*(4), 22-30.

Mahoney, N. R., Boland, M. V., Ramulu, P. Y., & Srikumaran, D. (2016). Implementing an electronic learning management system for an Ophthalmology residency program. *BMC medical education, 16*(1), 307.

Moazami, F., Bahrampour, E., Azar, M. R., Jahedi, F., & Moattari, M. (2014). Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. *BMC medical education, 14*(1), 1-5.

Oliveira, A. C., Mattos, S., & Coimbra, M. (2017). Development and assessment of an e-learning course on pediatric cardiology basics. *JMIR medical education, 3*(1), e10.

Osmani, F., & Hajizadeh, E. (2019). Combining Multiple Imputation and Inverse-Probability Weighting for Analyzing Response with Missing in the Presence of Covariates. *Journal of Biostatistics and Epidemiology*.

Osmani, F., Hajizadeh, E., Rasekhi, A., & Akbari, M. E. (2018). Analyzing Relationship Between Local and Metastasis Relapses with Survival of Patients with Breast Cancer: A Study Using Joint Frailty Model. *International Journal of Cancer Management, 11*(12), e81783.

Osmani, F., Hajizadeh, E., Rasekhi, A., & Akbari, M. E. (2019). Prognostic factors associated with locoronal relapses, metastatic relapses, and death among women with breast cancer. Population-based cohort study. *The Breast, 48*, 82-88.

Setiawan, A. R. (2020). Scientific Literacy Worksheets for Distance Learning in the Topic of Coronavirus 2019 (COVID-19).

Tanveer, M., Bhaumik, A., & Hassan, S. (2020). Covid-19 Pandemic, Outbreak Educational Sector and Students Online Learning in Saudi Arabia. *Journal of Entrepreneurship Education, 23*(3).

Viner, R. M., Russell, S. J., Croker, H., Packer, J., Ward, J., Stansfield, C., . . . Booy, R. (2020). School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child & Adolescent Health*.

Wilbur, K. (2016). Evaluating the online platform of a blended-learning pharmacist continuing education degree program. *Medical education online, 21*(1), 31832.

Zaharah, Z., Kirilova, G. I., & Windarti, A. (2020). Impact of Corona Virus Outbreak Towards Teaching and Learning Activities in Indonesia. *SALAM: Jurnal Sosial dan Budaya Syar-i, 7*(3), 269-282.