

Impact Of E-Learning, Perception, And Attitude Among Students And Faculty Following The Covid-19 Pandemic

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^{1,2,4,5} Conception of study

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^{1,2,3} Analysis/Interpretation/Discussion

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Abstract

Objective: This study was conducted to evaluate the implications of E-Learning and its future use by students and faculty members following the pandemic restrictions.

Material and Methods: The study was a cross-sectional survey that was distributed online among students and faculty members belonging to medical and non-medical programs across universities in major cities of Pakistan.

Results: Of the total 476 responses, it was evident that the majority of the students were not satisfied with the learning experience that virtual classrooms provided. Concerning clinical and practical skills, a majority agreed that the online teaching method is not an effective way to develop essential skills.

Conclusion: Online education may be a necessary technological advancement needed in the field of education, but as concluded from the results of this study there is a disagreement about virtual classrooms being an effective medium of learning. It is also inconvenient to develop appropriate practical and clinical skills using E-learning as a medium.

Keywords: Coronavirus, Education, E-Learning, Pakistan, Teaching, Undergraduate medical education, Virtual learning experience.

Introduction

Following the end of the year 2019, the world experienced the worst public health crisis of the 21st century known as the novel coronavirus disease 2019 (COVID-19). Owing to the infective and highly transmissible nature of the Coronavirus, Nations around the world had to take strict measures to lower the spread of this global pandemic ⁽¹⁾. Since the virus is pertinent to spread by airborne route ⁽¹⁾, one of the earliest preventive protocols prescribed by the Centre for Disease Control and Prevention (CDC) and World Health Organization (WHO), was social distancing and the use of Face masks ⁽²⁾. Also, to halt the rapid rise of cases restrictive lockdowns were imposed by various governments around the globe which led to a great setback to the economy and trade of nations. The educational sector also bore drastic effects as traditional learning activities were also disrupted ⁽³⁾.

The sudden break in regular educational cycles around the world demanded an alternate method of teaching and learning for students in schools, colleges, and universities around the globe, especially in developing nations like Pakistan. The whole paradigm was shifted from traditional learning to E-Learning ⁽⁴⁾ requiring technical support particularly the internet and multiple applications to deliver lectures either recorded or live lectures, different from the traditional brick-and-mortar classroom settings ⁽⁵⁾. This change in teaching trends was favorable in a pandemic situation such as that of COVID-19, with the biggest advantage being able to deliver lectures remotely. Many campuses a year later, still rely on online classes due to their convenience and uncertainty related to the virus.

This study aims to evaluate the future of E-learning based on the perceptions of students and faculty members from various disciplines in Pakistan both from the medical and non-medical programs.

Materials and Methods

A questionnaire-based cross-sectional study was designed to evaluate the impact of E-learning, perception, and attitude among students and faculty after the COVID-19 pandemic. A standardized and validated questionnaire was prepared through google forms. The sample of the study was calculated through the WHO sample size calculator with a confidence level of 95% and a margin of error of 5%.

Ethical approval was taken from the Institutional review committee before the commencement of the study. A link was generated and shared with the students and faculty of universities in the Federal region and Punjab through WhatsApp and email which remained active from 27 July 2021 to 27 September 2021. Participants above the age of 18 and enrolled in a university program were included and informed about the purpose of the study. Informed consent was sought beforehand. The questionnaire comprised 3 sections. The first section included demographic and institutional details. The second section comprised perception and attitude toward E-learning and the third section evaluated the practical aspect of E-learning. A 5-point Likert scale was used. Responses from all the forms were analyzed using *Statistical Package for Social Sciences, SPSS software for Windows version 23*.

Results

Demographics:

Out of the total 476 responses collected over one month, the majority; 61.3% (n = 292) were females and 38.7% (n = 184) were males. Faculty members comprised only 13.2% (n= 63) of the sample while the rest 86.8% (n = 413) were students. The majority of the respondents 44.3% (n = 211) belonged to Health and Allied Sciences faculties while those from Social Sciences and Engineering were 28.8% and 26.9% respectively (Table 1). 61.1% of the participants had attended more than 25 online sessions and a majority (47.1%) used Zoom application as their platform followed by *Microsoft Teams* with 36.1% of the users (Figure 1).

Impact on Teaching Sessions:

Our results indicate that online teaching and learning are highly inadequate in terms of clinical teachings concerning medical students of our sample. Out of the total 211 medical students, 63.5% (n = 134) were not confident to practice on patients after learning their skills online. A total of 82.4% (n = 174) of the medical students also disagreed collectively with the fact that E-learning is good for acquiring clinical and practical skills.

Students from engineering (44.5%) and social sciences (56.2%) also disagreed with E-learning being an effective medium of learning and developing practical skills.

Perceptions Regarding Online Teaching:

Students were asked various questions regarding how they felt about online teaching and their responses were recorded on a Likert Scale ranging from 1 to 5. It can be appreciated from Table 2 that students were not satisfied with the overall learning experience that virtual classrooms provided.

Table-1 Demographic Details of Participants

Variables	Frequency	Percentage (%)
Gender		
Male	184	38.7 %
Female	292	61.3 %
Designation		
Faculty member	63	13.2 %
Student	413	86.8 %
Department		
Engineering	128	26.9 %
Medical/Dental/Allied/ Health Sciences	211	44.3 %
Social Sciences	137	28.8 %

Table-2 Perceptions of Students Regarding E-Learning

Statement	Mean	Standard Deviation
• E-Learning allows a learning environment as the traditional classroom learning	2.24	1.156
• E-Learning is good for clinical and practical skills	2.24	1.339
• E-Learning is good for theoretical knowledge	3.09	1.096
• I am confident to sit in exams after taking online sessions	2.82	1.599
• Learning clinical and practical skills in a clinic/lab setup is effective	3.93	1.357
• Teachers provide feedback on exams and assignments	3.29	1.095
• The teacher's response to questions is timely	3.36	1.013
• E-Learning is more convenient and flexible than conventional learning	2.51	1.174

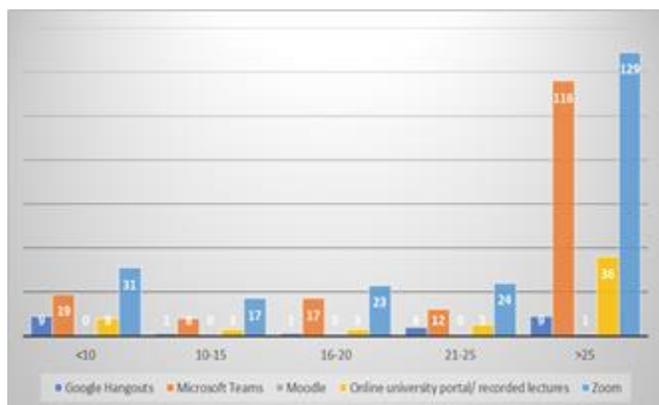


Figure-1 Applications Used and Number of Online Sessions Undertaken

Discussion

The onset of an unforeseen pandemic necessitates adjustments in everyday activities including educational processes. Due to the COVID-19 pandemic, many universities shifted to online education platforms. Before this pandemic, however, online education was not utilized much. In the current study, students' perceptions of their new learning experience were analyzed. The overall response rate in this study was low. Surveys performed using online platforms have been found to have lower response rates, with response rates as low as 50% in some situations (6,7). The majority (47.1%) of the participants preferred to use the Zoom application to attend their

online classes. Zoom application was originally designed as a commercial meeting platform, but it has grown in popularity as a tool for academics. Zoom application was chosen because of its easy-to-use interface, adaptability, and compatibility with a variety of hardware. Similar results were noted in a study conducted by M.S Abbasi et al.⁸ The 2nd most important mode preferred by our participants was Microsoft teams followed by Moodle. This pattern of preference was similar to studies carried out by Abbasi et al. and Malik et al. which revealed Moodle to be a common platform followed by Microsoft teams.^(8,9) The inclination of using one learning platform over another could be because of the availability, accessibility, affordability, and user-friendliness of different applications. Microsoft Teams includes several services that digital media users including students and teachers can use without incurring additional charges⁽¹⁰⁾. Moodle is said to provide the novelty of evaluating a specific audience, the value of teaching clinical skills, many interactions, and improved tools^(11,12).

The majority of students (59.9%) in our study seemed to be satisfied with the current online education system. These results were found to be in concordance with studies carried out in China and India with the overall satisfaction rate for online education among medical students found to be substantial^(13,14) but a study from Jordan found a low satisfaction rate (26.77%) with e-learning during the pandemic among medical students in clinical years⁽¹⁵⁾. Gender, year of study, acquaintance with computer skills, and previous online learning experiences appear to be positively associated with satisfaction leading to a favorable attitude towards e-learning⁽¹⁶⁾. Females (60.35%) expressed higher satisfaction and a more positive attitude toward e-learning than males (39.64%), which is consistent with earlier studies that suggest females are more inclined to engage in E-learning^(17,18). Another study, on the other hand, has refuted the significance of gender on learning methods acceptance or positivity^(19,20). Variations in sample size and evaluation methodologies could be a reason for these discrepancies.

In contrast to in-person learning, E-learning relies on the availability and functionality of technological devices (personal computers, laptops, tablets, and smartphones as well as an ongoing Internet connection⁽⁶⁾). According to our study, 49.6% of participants strongly agreed that poor internet connection was a hindrance to E-learning. These results are similar to a study conducted among 2000

medical students in which interruptions in Internet connectivity were cited by 40% of students as a compromise in E-learning⁽⁸⁾. This is consistent with earlier research linking limited use of E-learning to connectivity concerns⁽¹²⁾. Only 31.5% of participants agree that E-learning is good for theoretical knowledge, however, the majority of the participants reported that learning clinical and practical skills is effective in clinical setup as compared to online setup. Results of M.S Abbasi et.al. are similar to our study as they stated that more than 40% of students thought E-learning was a good way to absorb theoretical information, but a similar amount didn't think it was a good way to gain clinical and technical skills⁽⁸⁾. In contrast, Gormley et al. found that E-learning was just as effective as other traditional techniques for teaching clinical skills to medical students⁽²¹⁾. Surprisingly, it has been proposed that using a blended learning strategy with virtual clinical case studies in a variety of forms and modes not only facilitates learning but also leads to a beneficial shift in practice among medical students⁽²²⁻²³⁾.

Providing timely feedback by the teachers on the exams and assignments conducted online is equally important to help students improve in the areas they are deficient in. When asked about feedback, 39.1% of students in our study stated that teachers provided timely feedback on exams and assignments during the COVID-19 lockdown. E-learning was also praised by most participants for providing prompt responses and feedback from teachers in a similar study.⁸ This demonstrates the usefulness of teaching techniques that establish goals, allow teachers and peers to connect, and provide immediate feedback⁽²⁴⁾. In our study, 38.9% of students reported that teachers responded to questions timely. These results are contradicted with the study results of O' Lawrence et al. who claimed that when teachers are unable to see their students face to face, they are unable to detect signs of focus or inattention and hence are unable to react quickly⁽²⁵⁾. Multiple types of research conducted have looked into the impact of E-learning versus traditional learning on the improvement of clinical skills and outcomes for health professionals. However, the body of evidence suggests that it's unclear if E-learning enhances or degrades professional skills.⁽²⁶⁾ As a result of E-learning, most of the students in our study did not feel confident in their ability to practically and clinically manage patients. E-learning, on the other hand, has been demonstrated to encourage students to participate in clinical attachments and practice their clinical skills on

patients⁽²¹⁾. These findings are consistent with the results of our study and with the findings from a prior systematic review and meta-analysis,⁽²⁷⁾ as well as surveys of medical and dentistry students⁽²⁸⁻²⁹⁾.

Despite the tremendous disruptions caused by the pandemic, this technological revolution also provided a door to a new world. Not only online learning is becoming more popular, but online assessments are also becoming a trend, allowing schools to accelerate the process of internationalization, and helping people explore global distant education options. Owing to the limitations of this study, the sample size needs to be increased significantly with a greater response rate from the faculty members. Usually, studies aiming to evaluate the overall satisfaction rate have better results when data is collected qualitatively via individual or group interviews. This study was done via a questionnaire and was able to collect quantitative data. Our study paves way for more studies in the future that need to be conducted on this subject to assess the essential factors responsible for dissatisfaction among students regarding this method of learning.

Conclusion

Although E-learning is rapidly becoming the new norm in the modern education system with reduced in-person classrooms and projects being easily conducted via virtual meetings and classrooms, the results of our study reveal an apparent dissatisfaction among students regarding this new progress which is due to a lack of clinical and practical skills. This can be improved by adopting virtual simulation models and technologies to further enhance the impact of E-learning amongst students.

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