

## ORIGINAL ARTICLES

## CHALLENGES OF E-LEARNING FACED BY MEDICAL TEACHERS AND STUDENTS DURING COVID-19 PANDEMIC

Khadija Qamar, Faiza Kiran, Muhammad Alamgir Khan, Sayed Nusrat Raza, Maria Iram, Ayesha Rauf\*

Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, \*National University of Medical Sciences (NUMS) Rawalpindi Pakistan

## ABSTRACT

**Objective:** To explore perceptions of medical students and faculty, regarding challenges of e-learning they faced, during COVID-19 pandemic.

**Study Design:** Mixed method study (Quantitative and Qualitative - Phenomenological approach).

**Place and Duration of Study:** Army Medical College Pakistan, from Apr 2020 to Sep 2020.

**Methodology:** A self-made questionnaire, having both qualitative and quantitative elements, was developed after interviews of participants. It was pilot tested, finalized and sent via Google forms. Total 318 students and 6 faculty members responded, data was transcribed verbatim, themes were identified, and qualitative inductive content analysis of participants' reports was done.

**Results:** Twenty-seven subthemes were identified by analyzing students' and faculty perceptions. They were grouped under five major themes, namely, communicational, technological, institutional, related to educators and students.

**Conclusion:** Despite limiting factors like communication gap, digital refugee faculty teaching digital native students, limited technical support, digital divide and unplanned curricular delivery, e-learning was found to be beneficial in terms of flexibility in timings, improving learners' self-efficacy, faculty transformation and gradual acceptance. Moreover, it provided opportunity for hybrid e-curriculum development.

**Keywords:** COVID-19, Coronavirus infections, Medical students, Pandemics, Qualitative research, Student experiences, Student perceptions, Student safety.

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## INTRODUCTION

Last year, a novel virus, named COVID-19, outbreak caused anarchy in the monotonous routine of the world. On March 11, 2020, WHO declared it as a pandemic<sup>1</sup>. In Pakistan, the first case was reported from Karachi on February 26, 2020, with estimated populace of 204.65 million<sup>2</sup>. To prevent further spread of the disease, a provincial lockdown was instituted on March 23, 2020 by Sindh Government, later followed by nation wide smart lockdown causing closure of all educational institutions. Subsequent implementation of social distancing halted traditional curricular delivery<sup>3</sup>, encouraging a giant leap from traditional face-to-face instruction to online learning<sup>4</sup>.

Closure of medical colleges, especially in a

third world country like Pakistan with limited resources, posed a cumbersome threat to medical education as medical teaching is mainly patient centered requiring workplace-based learning and assessment. Though many other institutions had adopted latest technologies in their teaching, our medical educators were reluctant to change and were using traditional setup of face-to-face lectures in classrooms<sup>5</sup>. Soon, HEC granted permission to continue the learning process via online classes advocating safety of staff and students, and online-recorded lectures served as panacea to many educators<sup>5</sup>.

This sudden, massive, and unplanned transition from traditional to exclusive online learning changed the mode of curricular delivery<sup>5</sup>. However, online instructional methods are efficient tools for learning, they posed great challenges to our medical educators and students, who found this rapid transformation unsettling and frustra-

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**Correspondence:** Dr Khadija Qamar, Professor of Anatomy, Army Medical College Rawalpindi Pakistan

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ting. Despite prospective benefits, multiple barriers existed. The educators had inadequate online teaching expertise; they needed more time for preparation of online class, had to deal with traffic overload in online platforms and poor technical support<sup>5</sup>. Students also faced challenges like feeling of insecurity with digital refugee teachers; struggle to become an independent learner and unavailability of suitable materials for e-learning<sup>6</sup>. Lack of resources like poor internet connection, lack of motivation, decrease in communication between students and teachers, feeling of isolation were other contributory factors<sup>7</sup>. Nevertheless, a major challenge for educators was to keep learners engaged either by devising innovative learning strategies or constructing a socially interactive virtual environment<sup>7,8</sup>.

Learning efficiency and outcome has been strongly related to human interaction<sup>8</sup>, hence proving Bandura's and Vygotsky's learning theories<sup>9</sup>. Thus, few factors shaping online education were mutual faculty-student collaboration, high connectivity via emails, WhatsApp etc., student-centeredness, mutual exploration of new ideas, multisensory experience, and authenticity of learning resources<sup>10</sup>.

In face of this abrupt, transformational shift to online modalities of learning, it was sagacious to timely identify the strengths, weaknesses, and challenges of e-learning modes, thus converting them into fruitful opportunities. The objectives of study were to explore medical teachers' and undergraduate medical students' experiences on challenges of online learning implemented during COVID-19 pandemic.

## METHODOLOGY

This mixed method study was conducted from April to September 2020, in Army Medical College, Rawalpindi, Pakistan. Permission was granted from Ethics Review Committee, ERC ID/73. Study design was mixed quantitative and qualitative<sup>11</sup>. In qualitative study, phenomenological was adopted followed by inductive reasoning. To ensure sufficient diversity of opinion, maximum variation sampling was done; students

from first to final year were recruited. All those who voluntarily participated in the study by returning the filled questionnaire were included in the study whereas all those who did not return the filled questionnaire were excluded.

In the initial phase, an interactive, in-depth exploration of experiences of two faculty members who were taking online classes, and of two regular students was carried out. Based on their responses, a preliminary questionnaire was developed which was pilot tested on three teachers who were not objective study participants. This served to evaluate the clarity of questions, layout and eliminated ambiguities.

Based on the results of initial phase, a survey questionnaire was finalized having closed and open-ended questions, providing qualitative and quantitative elements about the faculty and students' perceptions regarding difficulties they faced in e-learning during corona pandemic and improvements that can be made. The responses of both students and faculty were transcribed verbatim, coded, and thematic analysis was done via inductive reasoning. Identified themes were listed and compared.

## RESULTS

Total 318 students responded. As shown in table-I, 288 (90.4%) students were in favor of regular face-to-face sessions. Only 138 (43.4%) thought that use of technology interferes with their ability to accomplish required course work, 264 (83%) were satisfied with the learning environment and 267 (84%) credited their teachers for it. Only 198 (62.3%) students found Internet and email as a good tool for communication with classmates.

Amongst teachers, only 6 responded to quantitative questionnaire, probably because most were too busy and overwhelmed with online classes. All (100%) were aware that students were quite resourceful with technology and were comfortable with online learning modes like chat rooms, emails etc. They (100%) knew that students learn from other resources on the internet. Regarding use of Google Classroom, all (100%)

had no qualms about using it. Almost 67% agreed that E-learning had not changed their instructional strategy i.e., lectures (table-II).

In qualitative study, twenty-seven sub-themes were identified by analyzing students' and faculty perceptions. They were grouped

faculty member said, "All resources were arranged by faculty themselves, either working from home or in offices, resources included all lesson plans, internet, laptops etc. Due to many online activities, there were many issues of internet and connectivity".

Adopting online learning is a prolonged process, as it requires motivated participants,

**Table-I: Number and percentage of students agreeing to questions asked about online learning.**

Questions	Total, 318 (100%)
A classroom environment makes it easier for me to communicate with my classmates.	281 (88.4)
I would prefer face-to-face instruction.	281 (88.4)
Face-to-face instruction helps me understand the course concepts better.	288 (90.4)
The use of technology interferes with my ability to accomplish the required coursework.	138 (43.4)
I feel challenged by the coursework.	210 (70)
The instructor understands the environment and makes it easy to learn online.	267 (84)
The learning environment helps me comprehend the course materials.	264 (83)
Access to the Internet/email makes it easier to communicate with my classmates.	198 (62.3)
Being in a classroom with face-to-face interaction, improves my ability to learn.	288 (90.6)

**Table-II: Number and percentage of teachers agreeing to questions asked about online learning.**

To what extent are your students comfortable doing the following	
a. Basic computer operation – turning it on, running software, using the CD-ROM, etc.	6 (100%)
b. Using email to communicate and share documents with others	6 (100%)
c. Using "instant messaging" or "chat rooms" to share ideas with others	6 (100%)
d. Using the internet to find resources to enhance teaching	6 (100%)
e. Using word processing, spreadsheets, or other software to organize, analyse and display data	3 (50%)
Please select your comfort level in integrating new classroom technology from the choices	
a. Uncomfortable	5 (83.3%)
b. Somewhat Uncomfortable	0
c. Somewhat Comfortable	1 (16.7%)
d. Comfortable	0
Please rate your level of agreement with the following statements regarding the use of on-line learning tools.	
a. On-line learning tools will increase the effectiveness of my classroom instructions	5 (83.3%)
b. On-line learning tools will increase the efficacy of identifying at-risk students	3 (50%)
c. On-line learning tools will have a positive impact on high achieving students.	3 (50%)
d. On-line learning tools will not change the instructional strategies of my classroom	4 (66.7%)
e. Ongoing professional support is a necessary part of integration process	5 (83.3%)

under five major themes, namely, communicational, technological, institutional, related to educators and students (table-III).

## DISCUSSION

It was seen from the responses of teachers and students, that both sides faced similar as well as varied challenges; these were grouped under common themes. Most students readily accepted online education and showed adaptability to the changing needs of times. Faculty, on the other hand, showed certain reservations. A

intense faculty training on e-learning tools and e-assessments, quality assurance processes and new policies<sup>6</sup>. However, due to unexpected and unpredictable circumstances, the system was introduced within days to limit the academic loss of students, which caused apprehension amongst teachers. With joint efforts of faculty and IT personnel, students were enrolled in Google classrooms which were efficient and convenient. This served as a major Learning Management System (LMS) for the institute. First issue with the Google classroom was limited data storage capa-

city allowed per user. It occupied the personal data storage during file uploading. Secondly, online learning, being an alien concept for stakeholders, presented few communication barriers where the discussion amongst student and teacher, and amongst peers was not possible to clear difficult or confusing concepts via this app. A

**Table-III: Challenges of E-learning faced during COVID-19 Pandemic.**

<b>Communicational</b>
<ul style="list-style-type: none"> <li>• Student-teacher</li> <li>• Student-student</li> <li>• Student-IT Admin</li> </ul>
<b>Technological</b>
<ul style="list-style-type: none"> <li>• Digital divide</li> <li>• Poor internet connection</li> <li>• Odd hours of lectures' uploading</li> </ul>
<b>Institutional</b>
<ul style="list-style-type: none"> <li>• Inadequate IT support</li> <li>• Official provision of internet, laptops, and computers</li> <li>• Centralized database/campus LMS</li> <li>• Extensive faculty training</li> <li>• Patient centered learning</li> <li>• E-learning policies on issues like e-attendance, class scheduling, sick leave etc.</li> <li>• Quality assurance</li> <li>• Hybrid curriculum</li> <li>• E-assessment tools</li> </ul>
<b>Educators</b>
<ul style="list-style-type: none"> <li>• Initial hesitancy/fear of technology</li> <li>• Technophobia</li> <li>• Poor lecture quality</li> <li>• Lack of synchronous teaching</li> <li>• Adapting modern tools of e-learning and e-assessment.</li> <li>• Judicious digital apps usage</li> </ul>
<b>Students</b>
<ul style="list-style-type: none"> <li>• Non-learning environment at home</li> <li>• Self-efficacy/self determination</li> <li>• Time management</li> <li>• Lack of motivation</li> </ul>

teacher said, "I feel there were few things which were missing; for example, it was sudden to start, so it was needed that some training of faculty must have been done in the beginning. The students and faculty were not prepared. There were varied situations in different areas due to pandemic, many pupils were from remote places where there were connectivity problems, faculty

members and students were inexperienced to carry out all activities. I think some central over-viewing of program; guidance and common strategies were required". It can be deduced from faculty response that they were aware of the need for proper training on e-learning modalities and further improvement in the system. Faculty also came up with few suggestions to improve e-learning, "The program can be improved by providing better internet facilities to all the students, ensuring active participation from students, a secure campus LMS would solve the storage issues faced by both students and faculty".

The situation posed psychological pressure on traditional, technophobic teachers who had never taught on any online platform. They were told to teach via online classes to a tech savvy generation. They had to learn basics of computers and upload their power point presentations with the help of IT personnel. Quickly recording online lectures was found unrealistic. Nevertheless, it was always a challenge for academicians to maintain students' attention in face-to-face classes, a vital issue faced by faculty was difficulty in ensuring learners' engagement during an online class. This could be due to lack of self-motivation, patience, self-discipline, time management and communication skills<sup>12</sup>. However, students who were already fighting for basic technological resources, watching poor quality pre-recorded lecture videos was frustrating.

A student commented on quality of lectures and wrote, "There were no proper online classes, the maximum we got were slides for reading. We lack much practical skills and knowledge as final year is the year where MBBS student starts to develop a proper clinical orientation. We have learnt theory from reading slides, books, and online sources". The reason was elementary; use of latest technology to teach millennials by adopting behaviorism instead of constructivism, no wonder gave these berserk reactions<sup>13</sup>. Providing evident solution to the issue, a student added, "Uploaded classwork is very helpful but an online class once a week can increase the efficiency of the process in order to compete with on-campus learning input". A paradigm shift to sy-

nchronous and personalized learning is deemed inevitable<sup>14</sup>.

It was also stated by students, *“only few teachers were quick to respond online, while most did not respond to emails, and made no efforts to interact online”*. A student complained, *“Lectures are not interactive; they’re uploaded at odd hours and there’s no routine or schedule. There is no assessment or way to check students’ concepts”*. Another one added, *“lectures were often times just a reading of the slides, without clinical cases to review and real time interaction”*. This explained Dewey’s instrumentalism theory in which he emphasized that learning demands relevance, cognitive presence by reflections and actionable knowledge<sup>10</sup>. In addition to audiovisual tutoring, creating virtual community of practice on e-discussion forums, adapting guided learning and clarity of given instructions via email or text messages, timely feedback on assignments can resolve these conflicts<sup>15</sup>. This will also make learning environment suitable for a Millennial learner<sup>16</sup>. A student suggested, *“inclusion of renowned online medical education systems (like Ken hub, animations, YouTube lecture links) may prove helpful”*. Another one added, *“Our institution can use Zoom for classes”*. Asking challenging questions, probing for elaboration, providing timely, clear, and concise responses, guiding, prompting, and focusing on specific issues during live classes or on discussion portals are some of the effective e-learning modalities. Weekly summarizing the content will add icing on the cake<sup>10</sup>. Teachers reasoned their inaccessibility by stating, *“multiple family members using the same connection and power outages were the issue. Not having a centralized database or campus LMS also created cloud storage issues, as personal accounts on Gmail only have a limited capacity for storage”*. Lack of uninterrupted internet was a major obstacle in smooth running of online sessions, as most of our students came from rural and remote areas where internet facility was scarce. Students from the city had high-speed internet access but those living in farflung areas did not have this luxury. This made achievement gap wider amongst students. Moreover, a good connection adds

to the cost of a middle class monthly, household expenditure as internet is not cheaper in these areas. Now students from poor socioeconomic class may have to fight with this “digital divide” (the gap created by poor internet access) against their privileged peers. This technical inequity is another growing problem being faced during online education<sup>17</sup>. To facilitate online learning, hostel accommodation was provided to those who were unable to study at their home place.

Despite all challenges and weaknesses, e-learning proved beneficial for those who were motivated, self-directed learners and had high-speed internet access. It also reduced the time and costs for travel, provided flexibility in daily class schedules and freedom to maintain own pace for learning<sup>10</sup>. A student favored e-learning by commenting, *“Studying from slides online saved time when routine in college may not allow revision on the very same day”*. Another one endorsed his peer, *“It provided enough time to pause the lecture and clarify the concepts”*. However, those students who were focused on attendance, giving tests and completion of course found asynchronous teaching ineffective. One student deliberated, *“The huge gap in examinations really broke the habit of giving exams and internalizing large sums of data. Inactivity of the cerebral cortex made it hard to rejoin the routine”*. These students need to schedule their week days, by making each day a “Structured Day” which is defined as a preplanned, segmented, and adult supervised compulsory environment<sup>18</sup>. This will teach them self-discipline, self-efficacy, and time management<sup>19</sup>.

Timely and standardized assessment was an added concern of faculty members. They emphasized on major requirement of a standardized online system for students’ assessment and teachers’ evaluation. Performance assessments were more challenging to administer online as it is challenging to ensure sanctity of the exam and its secrecy. Therefore, strategies for adapting e-assessments tools need implementation, after careful deliberation. Some students were in favor of online face-to-face viva. Literature suggests graded online activities like discussions, timed quizzes,

group presentations, assignments and maintaining portfolios are valid e-assessment tools<sup>20</sup>.

Most respondents showed interest in hybrid model of education than exclusive online system. Students also wished to be the part of new curricular making process by giving active, timely and regular feedback. Blended learning or hybrid curriculum is desirable because it combines “the best of both worlds”<sup>20</sup>, though faculty training and institutional support are needed at the top tier<sup>16</sup>. According to them, development of a personalized online education portal/LMS is the premier requirement to avoid any trouble and glitches in future. This personalized e-education portal can promise all-time lectures’ availability and enhanced data storage capacity.

Being aware of the advantages of e-learning, students wanted continuation of online education in a hybrid curriculum, even after end of Pandemic. A student specified, “lectures should be uploaded on LMS instead of giving in classrooms. This will give us more time to spend in wards with patients and we will have liberty of flexible timings for listening to recorded audios”. Another student bluntly told, “we have access to lectures of other online resources and prefer to listen to those”. It is advisable for teachers to find innovative ways to keep their students engaged. However, this can only be achieved by allocating funds for faculty development in E-learning strategies. Some examples are developing online resource pages for faculty to aid in planning and lesson preparation, increased video calling time by Zoom on request<sup>15</sup>.

### LIMITATION OF STUDY

It is conducted in a single public sector medical college of the country, where students came from diverse socio-economic status yet respondent’s universality was still limited. Hence, its results cannot be generalized. Moreover, we did not ask for students’ academic grades as their standing position in class might have modified their responses. Despite these limitations, this study gave vital information and offered useful suggestions for policy makers, curricular developers, researchers, enabled them to get better acq-

uainted with the key aspects of e-learning system usage. It also uncovered the opportunities hidden in the impact of this global health emergency, in a third world country like Pakistan. It empowered us to pave our way to tailor our curriculum according to millennials’ preferences whilst faculty hesitancy diminished as use of technology for learning was unavoidable.

### CONCLUSION

Challenges presented by introduction of online education during corona pandemic were related to communication, technology, institution, educators, and students. Despite the obstacles like communication gap, computer illiterate faculty, limited technical support, digital divide and unplanned curricular delivery, e-learning was found to be beneficial in terms of flexibility in timings, improving learners’ self-efficacy, faculty transformation, contingent acceptance and provided opportunity for hybrid e-curriculum development.

### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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