

Gear Up For Online Teaching: Challenges, And Solutions

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Abstract

Objectives: The objectives encompassed identifying the myriad challenges educators face, elucidating their coping strategies, examining the support systems in place, and evaluating the efficacy of the measures taken to address these challenges.

Methods: Conducted at Jinnah Sindh Medical University from January 2021 to April 2021, the study employed a descriptive cross-sectional approach involving teaching faculty members from both constituent and affiliated institutions during the COVID locked down period. With a total faculty population of 200, a sample size of 124 was determined, utilizing a 95% confidence interval and a 5% margin of error. Convenience sampling facilitated the recruitment process, with Principals/Heads serving as conduits for disseminating information about the research and distributing the questionnaire.

Leveraging Google Forms as the data collection tool, the questionnaire encompassed various dimensions, including consent, biodata, encountered technical difficulties, and the corresponding solutions implemented. Upon securing Institutional Review Board (IRB) approval (JSMU/IRB/2021/406), the questionnaire dissemination process commenced, underscoring the ethical considerations inherent in research involving human subjects.

Results: Analysis of the gathered data, performed using SPSS version 18, revealed valuable insights from the 124 participating teachers. Noteworthy demographic trends emerged, with a predominance of female teaching faculty possessing postgraduate qualifications and boasting 5-10 years of teaching experience. Key challenges encountered during online teaching sessions centered around broadband connectivity issues, inadequacy of devices for virtual instruction, and a perceived lack of requisite training. Mitigating these challenges necessitated concerted efforts, as evidenced by the proactive interventions orchestrated by entities such as the Professional Development Center/Medical Education and the Information Technology department. Through targeted training initiatives and infrastructure enhancements, including broadband speed upgrades and the provision of essential gadgets, faculty members were empowered to navigate the evolving landscape of online education.

Conclusion: The study investigated the transition to online teaching among faculty members during the COVID-19 pandemic, revealing a predominantly female demographic with limited prior online teaching experience. Challenges included assessing student learning and addressing technological barriers, with solutions primarily stemming from professional development and personal technological investments.

Keywords: Distance education, online learning, Education, Distance/standards

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Introduction

The outbreak of Covid-19 had a tremendous impact globally and locally. This pandemic emanated in disrupting virtually all the pursuits encompassing

education and healthcare practice globally^{1, 2}. Academic activities interruption propagated the change to distance education which provided a platform for students to complete their studies uninterrupted and expedite their graduation. This gave rise to a blended learning environment across the world¹⁻⁴. Similar efforts were made in Pakistan as well.

Amidst these circumstances, the transformation from conventional to distance learning transpired numerous obstacles and challenges but also

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conferred various prospects, such as the introduction of online learning in curricula and up-skilling and restructuring of emerging technology⁵. The change required training and planning but as the shift was sudden problems were expected to arise. The faculty involved in blended teaching are specially trained to design curricula to support blended learning teaching and evaluation and here the training and expertise were both amiss⁶. Specially, the professional programs running are highly skilled dependent like medicine and allied health sciences. To accommodate for this loss, the healthcare fraternity responded through different strategies to support student learning. This was seen in the published research that followed these strategies which highlighted the challenges and problems faced by them. The academic experts across the globe published vigorously to discuss concerns of health professions education, inclusive of teaching practices, challenges, and suggested remedies mostly from the student's point of view which were the major stakeholders in the situation⁷⁻⁹. Digital education plans were implemented globally to preserve students' learning routines. Correspondingly, in Pakistan, the Federal and Provincial governments and the Higher Education Commission promoted academic digitalization with remote learning in order to prevent the spread of this deadly virus¹⁰. A lot of work has been done in determining the satisfaction level of students with available video conferencing software, virtual learning environments and online teaching activities arranged and management of these activities globally as the students were major stakeholders. Their future was at stake and hence their satisfaction with the teaching methods was a necessity. Few of the research articles also covered the pedagogical shift with technical rigor^{6-9,11,12}.

Problems faced by the teaching faculty in terms of technical problems or related to pedagogy and assessment were covered by a handful of articles. Few were written in Pakistan as well, to help guide the faculty in adapting and utilizing the available options to best of their circumstances⁶. Most of the research covered the teaching methodology

and platforms utilized for teaching and learning. The perspective of faculty to these changes and how they managed their time and skills to optimize these changes when the available facilities were restricted is not covered fully. Let alone, the solution of the problems and how much these problems were solved. The relevant institutional heads and higher education commission provided training opportunities and purchased platforms to switch to e-Learning. To the best of our knowledge, scarce research has been published in Pakistan, highlighting the obstacles encountered by the faculty⁷⁻⁹. Therefore, we explored the challenges the faculty of various health sciences disciplines confronted during social confinement and how these problems were rectified in a public sector university of Karachi along with the private affiliated institutes

Methodology

After approval from the institutional review board, a cross-sectional study was conducted at Jinnah Sindh Medical University. The study participants included faculty members from constituent and affiliated medical and dental colleges. The sample size calculated was 124 at a 95% confidence interval with 5% chances of error¹³. Convenience non-probability sampling was done. The inclusion criteria included those who taught online during the 2019-2020 time and faculty members who took less than five online sessions in the stated period were excluded from the study. After the approval of the IRB, request letters to institutional Heads/Principals were sent and the selected coordinators from the institutes were sent the link to the questionnaire to be distributed to faculty members.

The data was collected using an online questionnaire consisting of 15 items developed by the authors. Instruments cited in similar studies were studied for guidance^{8,9,14-17}. brief introduction, research objectives, procedure, confidentiality, notes for filling in the questionnaire and consent form were provided to all study participants.

The structured questionnaire comprised of three sections: The first section focused on the demographic and relevant professional information. The

second section had 12 close-ended questions enquiring about the experience of online teaching during the COVID era. The third section had three closed-ended questions about the difficulties experienced by the faculty during online education and their solutions. The instrument was piloted on 10% of the estimated sample population. The face validity was good, and the reliability was calculated to be 0.7 Crohn Bach’s Alpha which is also good. The resulting data was not considered for the final data analysis of the study.

All the heads of constituent and affiliated medical and allied undergraduate institutes were requested to collaborate. Thereupon, the Google form link was shared among the faculty members.

Results

The data were analyzed using SPSS version 18. A total of 124 completed forms were received. They are described in sections to simplify the reporting.

Demographics of the faculty are summarized in Table 1. The male to female ratio was 1:2 with 59% from private institutes and 41% from government-based setups. The educational qualification of respondents was predominant Masters/MCPS/MRCP followed by Bachelors. Majority of the respondents belonged to basic sciences 54(43.5%) and had 5-10 years of experience 48(38.7%). Most of the faculty had no experience of teaching online prior to the Covid era.

Table 1. Demographic data in percentile.

Instrument	Classes	n (%)
n=124		
Gender	Male	33(26.6)
	Female	67(54)
Institute	Public	41(33)
	Private	59(47.5)
Education Level	Bachelors	33(26.6)
	MSc./MCPS/MRCP	39(31.45)
	PhD	4(3.22)
	FCPS/FRCS	24(19.35)
Area of Teaching	Basic Sciences	54(43.5)
	Clinical Sciences	27(21.77)
	Both	19(15.32)
Teaching Experience	Less than 5 years	39(31.45)
	5-10 years	48(38.7)
	More than 11 years	37(29.8)
Online teaching experience before the COVID era	Yes	19(15.32)
	No	81(65.32)

This section enquired about the difficulties faced during online teaching, which started from March 2020 in most of the institutes 83(66.93%). Teaching sessions were mostly asynchronous 29(23.38%).

Table 2. Details about the Online teaching sessions.

Question: When did you start online teaching?	n(%)
June - August 2020	23(18.54)
March-May 2020	83(66.93)
September - November 2020	18(14.51)

Question: How do you teach online?	n(%)
Asynchronous (recorded lectures)	19(15.32)
Both with mostly asynchronous	29(23.38)
Both with mostly synchronous	28(22.58)
Synchronous (sessions in real-time)	48(38.70)

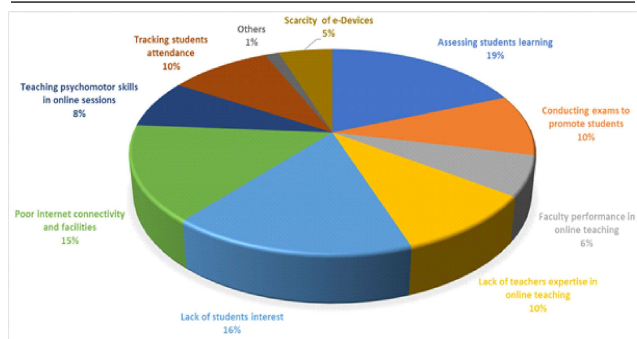


Fig 1 Difficulties Faced during Online teaching sessions.

Figure 1 summarizes the difficulties faced during online teaching sessions. The highest responded for assessing students learning was 23(18.9%), and lowest for others was 2(1.3%).

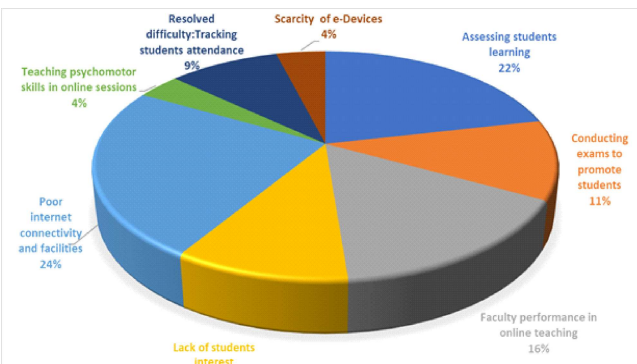


Fig 2. Difficulties which were solved.

Figure 2 shows the problems that were resolved. The highest response for poor internet connectivity and facilities was 24.1%, and the lowest response teaching psychomotor skills in online sessions was 3.6%.

Table 3. strategies utilized to solve the problems.

S No.	Item	Number of participants (N=124)	Percentage %
1.	Personal arrangement of high-speed internet	16	12.9
2.	Personal purchase of e-devices	12	9.7
3.	Adding further plug-ins	5	4.0
4.	Using gamification tools	7	5.6
5.	Using assessment tools of Learning Management System(LMS)	11	8.9
6.	Training by IT	24	19.3
7.	Training by Professional Development Center	26	20.9
8.	Institutional Purchase of e-devices	4	3.2
9.	Institutional arrangement of high speed internet device	19	15.3

The Table 3. above shows that the problems faced during online teaching were majorly resolved by professional training by Professional Development Centre/Department of Medical Education 26(20.9%), and lowest responses for institutional purchase of e-devices 4(3.2%).

Discussion

Online education took over the world during 2020-2021 during frequent lockdowns and restrictions to large gatherings. During this period, the problems faced by the teaching faculty in Pakistan were highlighted in this paper.

Faculty exposure to “Online teaching” was 19% which was very low prior to this. Faculty involved in teaching consisted of 60% females with 54% from the basic sciences while only 27% were from clinical sciences. Majority (39%) of respondents had a master-level qualification, followed by 33% with a bachelor’s degree. More than one third (38%) of the respondents had 5-10 years of teaching experience. This shows that the teachers involved in online teaching were all well experienced and subject specialists.

Varied difficulties were reported to be faced by the respondents during online teaching. Assessing students’ learning was found to be most difficult

(22%). This is understandable since medicine requires students to demonstrate competence in technical and procedural skills, which could not be assessed without interacting with a simulated or real patient due to the promulgated standard operating procedures for Covid. Lack of student interest (16.4%) and poor internet connectivity and technological facilities (15.1%) were the other two main problems. These problems were mostly linked to the inexperience of the faculty with online teaching. Student engagement and motivation played a major role in online attendance and response of students. A change in teaching strategy was required to support the students and teachers to maximize the results of the sessions. These strategies included the use of gamification tools such as Kahoot, Socrative for engaging the students. Thus, creating a learning environment supportive of the purpose by making it interactive and enjoyable to the students. The second objective was to find out whether the above problems were solved and to what extent. We found that poor internet connectivity was the most common problem solved. While teaching psychomotor skills in online sessions was addressed in only 3.6% of the cases. The medical and dental courses mainly are resting on clinical skills. Teaching these procedural skills online was difficult with teachers with no previous exposure and scarcity of available tools. Teachers adapted differently across the globe to this specific problem. In a case-control study conducted in Hong Kong, final year medical students were taught basic surgical skills through web-based surgical skill learning sessions¹⁵. Then they were scored on a pattern of Structured Assessment of Technical Skills (OSATS) global rating scale. They concluded that the competency of both groups was almost the same for the control group 4.8 score on average was obtained while for the case group 4.7 on average was scored out of 5.

The third section and the objective were to find out how these problems were solved. We found that training by the professional development center or medical education department either alone or in combination with training from the IT department resolved these issues. The lowest response was for the item "purchase of e-devices by institutes". The overall results show that the predominant problems were related to the computer skills, knowledge, and exposure of the faculty, which is mirrored when we see responses from sections on how these problems were solved. Although, the problem that was not addressed as pointed out in comparison of results from sections 1 and 2 was the teaching expertise of the faculty, which was solved indirectly by training from medical education and professional development center. All these problems and their solutions are similar to the previous study held during the transition phase of the shift all across Pakistan in April 2020¹. They concluded that the most common problems were inefficient internet, technical difficulties, loss of interest of students and difficulty in teaching clinical skills which were solved by broadening the connection speed and workshops arranged by the medical education and IT department. Lack of human interaction caused loss of interest of students which made teaching a difficult task. Teaching and assessing students was difficult in this transitional phase as distance learning was a new concept to both students and teachers. Another study held in Kerala, India showed that most of the participants (73%) lost interest and discontinued online sessions because of too many classes and their overlapping¹⁸. Among other causes included poor internet connection, difficulty in time management, interest in the subject, lack of faculty expertise to navigate through online sessions and maintain student interest. Overall, 50% of the students were unsatisfied with the distance learning. A similar study conducted to find out the medical teacher's perspectives in Germany regarding the current situation of Covid 19 and medical teaching showed that the faculty was under distress with main concern was the changes in medical education and teaching strategies¹⁹. Another study published in the Philippines evaluated the barriers and

solutions of online teaching has similar findings⁹. They have concluded that problems that arise because of a sudden change to online mode were time constraints, lack of technical skills, lacking infrastructure, missing institutional strategies, all of this backed by an overall negative attitude to this shift.

Reflecting upon these results we came to conclude that most of the problems faced by the faculty were due to an unplanned switch to online teaching as supported by other articles in the field. Prior training in online teaching and assessment, from the PDC/ medical education/IT department, would have resulted in reduced stress and pressure on the faculty. Evaluation of the readiness of the organization to sudden switch to pedagogical strategy on each level would have decreased this confusion and frustration stage of faculty and students alike. Pre-switching evaluation to determine optimum broadband speed and gadgets required would have further decreased the problems.

The authors are of the view that usage of online platforms for teaching or assessment should be continued even post-covid to enhance the interest of the students and to maintain quality in health professions education. As supported by literature, gamification tools should be utilized to engage and motivate them to improve the learning outcome, used as part of formative assessment²⁰. Regular training of faculty to the latest teaching strategies and assessment tools would decrease the negative behavior of teachers to future switch to pedagogical shift. Also, offering 1 to 2 courses online per year or semester as may be feasible to students will also decrease their reluctance to change.

The current study covers the struggles of teachers during sudden shift to online education. Providing insights to how the problems were addressed and how much they were actually resolved. Majority of the problems were related to internet speed and inexperience with the selected virtual platform selected for teaching which were either solved by buying high speed internet connection and training from IT and Professional Develop-

ment center in support from Medical education department.

A follow-up regarding the problems and solutions is lacking. We conducted the study in the transformative phase of online education and the problems in the current period when distance learning has become an established mode of teaching might raise new challenges which should also be addressed similarly. Also, lacking qualitative aspects of the problems might have brought more insight to the struggles of the faculty to cope with pandemic crisis, uncertainty and continuing online work with time management. A longitudinal study in the post-COVID phase should be conducted to find out the resolution of problems associated with online learning and evaluate continuation of blended learning as successful means of providing education

Conclusion

The study looked into how faculty members changed to teaching online during the COVID-19 epidemic, and it found that most of them were women and had little experience teaching online before. Assessing student learning and removing technical hurdles were the challenges they faced, while professional growth and upgrading of internet devices were the main solutions. These results highlight how crucial it is to provide educators with continual training and assistance so they can successfully navigate the digital learning environment.

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