

ORIGINAL ARTICLE

BENEFITS AND DISBENEFITS OF ONLINE TEACHING DURING THE PANDEMIC: STUDENTS' LEARNING EXPERIENCE**Samia Perwaiz Khan, Maham Sohail Shaikh*, Mohammad Arqam Ashraf Hamidani*, Inshrah Hanif Raja*, Sara Mubeen*, Sadaf Fatima Naqvi****

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Background: Virtual teaching approach includes combination of e-learning technology with traditional instructor-led training as online classes. The study explores the benefits, dis-benefits of online teaching for medical and dental undergraduate students and assesses how to overcome the challenges to online medical education during the pandemic. **Methods:** It was a cross-sectional study. The sample size was 150 including 100 MBBS and 50 BDS students of Jinnah Medical and Dental College, Karachi. The participants were enrolled in study through convenience sampling technique. Through a questionnaire-based survey conducted in the year 2021 benefits, dis-benefits of virtual teaching and learning of pharmacology as well as the difficulties faced by the participants, were assessed. The questionnaire was developed and pilot testing was done on 20 medical students. The data was analysed using Chi-square test. **Results:** The overall results of this study were not up to the mark and dis-benefits experienced by the participants in this study were high. This study also highlights certain issues including technical issues of internet interruptions/ bandwidth (92%), disturbances during the online sessions (79%), missing the interactive dialogues with lecturers (75%), missing end of session revision (67%), quality issues of recorded lectures (66%), short duration of online sessions (44%). **Conclusion:** The online teaching during COVID-19 pandemic lockdowns had been effective in filling-in the gaps. It also highlights the areas that need to be addressed to overcome the shortcomings in order to further improve the benefits and effectiveness of online learning.

Keywords: Virtual teaching, pandemic, benefits, dis-benefits, Gagne's 9 events of instruction

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INTRODUCTION

The world education systems have been severely affected by COVID-19 pandemic disrupting almost every aspect of life and sectors of global economy.¹ The education sector is no exception, where the traditional education system with in-person face-to-face teaching can no longer be taken for granted due to recurrent closures of institutions. Educational institutions around the world are looking towards the alternative like virtual teaching to overcome the interruptions and resulting gaps in teaching caused by lockdowns. This is because almost all educational institutions around the world had been closed or disturbed due to frequent lockdowns and the students were unable to meet their teachers in person.^{1,2} Like the rest of the world, medical educational institutes in Pakistan had to conduct virtual teaching during COVID-19 pandemic lockdowns.³ Virtual teaching (distant teaching) is an approach that combines e-learning technology with traditional instructor-led training, as lectures or demonstrations are supplemented by online tutorials.

Virtual online teaching has a number of advantages including augmenting and enhancing both teaching and learning processes.² These advantages can be categorized as targeting either learning delivery or learning enhancement. Advantages of learning through online lectures include increased accessibility to

information, ease in updating content, personalized instruction, and continuing education during the pandemic.³ Virtual or online teaching provides flexibility to learners to revise their lesson contents as many times and at any time of their convenience. Also, the learners have control over the learning sequence and pace of learning.^{4,5} Robert Gagne's nine steps event of instructions process for improving the traditional face-to-face teaching can also be applied to distant learning to improve its efficacy.⁶⁻⁹

However, there are issues reported regarding the difficulty of implementing distance teaching including issues with digital technologies as well as insufficient availability of computers in medical education institutions.^{1,2} The few digital technologies that have been implemented and used, fail to provoke innovative ways of teaching and learning.¹⁰ Studies done in Pakistan have also reported the challenges and difficulties faced by students with online learning.^{11,12} This study aims to cover a number of important issues in virtual teaching. It first assesses the level of acceptance as well as effectiveness of virtual teaching using Zoom, Google Classroom or lectures uploaded on student portal of the College during the pandemic lockdown periods. It also assesses the shortcoming and dis-benefits, which if reduced or removed can enhance the acceptance and efficacy of online teaching.

METHODOLOGY

This was a cross-sectional quantitative study conducted from April to September 2021 at Jinnah Medical and Dental College, Karachi. Ethical approval for the study was taken from the Ethical Review Committee of the College (Ref. Protocol 1#000100121). One hundred and fifty undergraduate MBBS and BDS students of the College who were attending the online pharmacology classes using Zoom, Google Classroom and College Lesson Portal were included in the study. The students included in this study group also participated in Problem-based Learning sessions along with regular online assessments. The sample size was calculated on the Raosoft sample size calculator. The sample size was calculated keeping 5% margin of error, 95% confidence interval and 50% response distribution. The minimum recommended sample size was of 109 students. The participants were enrolled in study through convenience sampling. Written informed consent was taken from the participants.

The Questionnaire was developed and pilot study was done on 20 medical students. After that data was collected anonymously from participating students. Overall benefits and dis-benefits of virtual teaching methods were assessed on a four points Likert scale Excellent, Good, Fair and Poor through a questionnaire. Exam assessment scores of the participating students were also collected to corroborate and compare with the outcome of virtual teaching benefits and dis-benefits questionnaire survey. Through the questionnaire the issues faced by the students which affected their experience of virtual teaching were also collected to see if guidance can be developed for improving the efficacy of virtual teaching going forward. Descriptive statistics were used for analysis of data.

The questionnaire also obtained data on the experiences of study group participants regarding the issues they faced during the online courses. These issues were divided under the heads: 1) sufficiency of the duration of online sessions; 2) extent of sessions being interactive; 3) sufficiency of the option of end of session revisions; 4) extent of technical problems faced, like internet bandwidth/electricity interruption, etc.; 5) voice/sound and video quality; 6) the extent of disturbances faced during online Zoom sessions; and 7) overall sufficiency of comprehension and understanding of online learning experience.

RESULTS

The mean age of 150 MBBS and BDS students of academic year 2020–21 who participated in the study was 20±2 years. Female to male ratio were 6:4. One hundred and fifteen (77%) of these students attended lectures through Wi-Fi connection, while 35 (23%)

used mobile phones to attend the virtual classes. Seventy-three (49%) of these students were attending online lectures for the first time. One hundred and twenty-eight (85%) of them attended these sessions alone and twenty-eight (19%) attended as groups (Table-1).

Table-1: Study group participant characteristics (n=150)

| General Characteristics | Results |
|--|-------------|
| Age | 18–22 years |
| Academic Year | 2020-2021 |
| Gender | |
| Female | 90 (60%) |
| Male | 60 (40%) |
| Undergraduate Program | |
| MBBS – 3 rd Year | 100 |
| BDS – 2 nd Year | 50 |
| Type of internet connection used | |
| Mobile phone data | 35 (23%) |
| Wi-Fi | 115 (77%) |
| Broadband | – |
| Is it first time you are attending on-line classes? | |
| Yes | 73 (49%) |
| No | 77 (51%) |
| Do you access application using: | |
| Mobile phone | 35 (23%) |
| Laptop | 110 (73%) |
| iPad | 5 (3%) |
| Do you attend class | |
| Alone | 128 (85%) |
| In Groups | 22 (15%) |

Overall benefits and dis-benefits of the online courses were assessed on a four points Likert scale as excellent 19 (12.6%), good 21 (14%), fair 62 (41.32%), poor 48 (32%) by filling in questionnaire forms by both MBBS and BDS undergraduate students. Final university examination assessments of the students were also obtained, and these were satisfactory in 70 (46.6%) and un-satisfactory in 80 (53.3%) students.

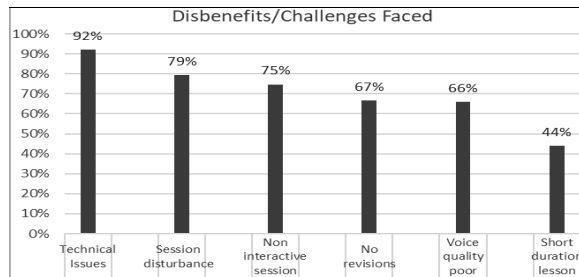
Issues faced by the study participants who contributed to the dis-benefits and dis-satisfaction of their online teaching experiences during this study are shown in Figure-1 in descending order of their frequency of occurrence. The most frequent problem was technical issues 138 (92%) related to internet bandwidth which slowed and/or disrupted the online content transmission, electricity interruptions, etc. followed by disturbances/interruptions occurring during the online sessions 119 (79%), not having the option of interactive dialogue with instructors/lecturers 112 (75%), not having the option of end of session revisions 100 (67%), sound/quality issues of recorded lectures 99 (66%) and duration of the online session being too short 66 (44%), (Table-2).

The overall acceptance and results with online courses were not satisfactory, the issues highlighted in this study are shown in Figure-1.

Table-2: Benefits and dis-benefits of online teaching

| Issues | Benefits | Dis-benefits |
|-----------------------------------|---------------|--------------|
| Online session duration | Normal (n=84) | Short (n=66) |
| Interactive session | Yes (n=38) | No (n=112) |
| Able to revise with facilitator | Yes (n=50) | No (n=100) |
| Technical issues faced | No (n=138) | Yes (n=12) |
| Voice quality | Good (n=51) | Poor (n=99) |
| Disturbance during class sessions | No (n=31) | Yes (n=119) |

Figure-1: Issues causing dis-benefits and their frequency of occurrence



DISCUSSION

The present study has assessed the benefits and dis-benefits/challenges faced by the students who had to use online distance learning methodologies during COVID-19 lockdown situation. The overall results were dissatisfactory and the disbenefits were more as compared to the benefits. There is relatively younger age of the study participants (18–22 year), who are more computer savvy and comfortable with social media and other online tools and virtual experiences. However, this study brings forth certain critical issues, which if addressed can improve and enhance the experience and benefits of online teaching. Fortunately, these shortcomings have less to do with pedagogical issues and more to do with infrastructure of online education and design of instruction.

Two of the most frequently occurring issues plaguing the online learning experiences of the students in this study were technical issues of internet interruptions/bandwidth (92%) and short duration of Zoom lecture sessions (66%). Zoom and similar other companies had removed the restriction of free 40 minutes sessions for students and educational institutions during pandemic in other countries. Either the same facility can be requested for educational institutions/students in Pakistan or alternately educational institutions where required can invest in such facilities like buying Zoom pro or Zoom business. This could also address the issue of having optimum time duration of online lectures as well as provide sufficient time for end of lecture revisions, absence of which was also reported as one of the significant dis-benefit/impediment (67%). For addressing the issue of interruptions caused due to technical issues (92%) of internet disruptions/bandwidth, etc. apart from the

concerned educational institutions and their students, the government and in particular Higher Education Commission, Pakistan can be requested to step in and assist. Even post COVID-19, in future online distant learning is here to stay as part of the blended and hybrid learning management system.¹³

Two other issues pointed out in this study regarding disturbance during online sessions (79%) and quality of sound in the uploaded lectures/videos, perhaps can be addressed by the concerned educational institutions, their information technology (IT) departments and content producers/lecturers. This has been highlighted earlier also in a study, that educational institutions should be making efforts towards training faculty and development of IT in their institution for providing continuous education to the undergraduate students for the development of future clinicians even during the most difficult times such as pandemic.^{14,15} Thus, with the changes due to COVID-19 in every field, it has been recommended in the study to train medical faculty and students for virtual teaching and learning by conducting Zoom and other online sessions.¹³

It is known that distant learning and teaching have issues related with technology and learning management systems of institutions.^{16–18} In the difficult times of the pandemic, medical schools have a duty to provide ongoing education to medical students. The continuation of teaching is essential to enable the graduation of medical and dental students in the communities without the risk of exposing them to COVID-19. Various studies have suggested that virtual teaching is effective, and institutions are working for the development of resources to improve this by acquiring latest technology and training their faculty.^{19–21} In a study it was found that there is not much difference in the effectiveness of undergraduates e-learning compared to traditional face to face learning for non-clinical or non-practical work.²² However, in the present study, the medical/dental faculty students found the online learning to be not as much effective and at the same time highlighted the aspects which need to be addressed to further improve its benefits and effectiveness.

CONCLUSION

The online teaching during COVID-19 pandemic lockdowns had been effective in filling-in the gaps. It is likely to stay even in post-pandemic times. It is essential that impediments highlighted in this study be addressed and investments in training of faculty and developing courses using the virtual online media be undertaken.

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REFERENCES

1. Pettersson F, Olofsson AD. Implementing distance teaching at a large scale in medical education: A struggle between dominant and non-dominant teaching activities. *Educ Info Technol* 2015;20:359–80.
2. Alsoufi A, Alsuyihili A, Msherghi A, Elhadi A, Atiyah H, Ashini A, *et al.* Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. *PLoS ONE* 2020;15(11):e0242905.
3. Karim Z, Javed A, Azeem MW. The effects of COVID-19 on medical education. *Pak J Med Sci* 2022;38(1):320–2.
4. Gibbons A, Fairweather P. Computer based instruction. In: Tobias S, Fletcher J, (Eds). *Training & Retraining: A Handbook for Business, Industry, Government, and the Military*. New York: Macmillan Reference USA, 2000:410–42.
5. Hussein G. The attitudes of undergraduate students towards motivation and technology in a foreign language classroom. *Int J Learn Teach* 2010;2(2):14–24.
6. Gagne RM. *The Conditions of Learning*. New York: Holt, Rinehart and Winston;1977. 339 p.
7. Gagne RM, Wager WW, Golas KC, Keller JM, Russell JD. *Principles of instructional design*. (5th ed). *Perform Improv* 2005;44(2):44–6.
8. Gagné RM, (Ed). *Instructional Technology: Foundations*. Hillsdale, NJ: L. Erlbaum Associates; 2013.
9. Solanki MR. Developing instructional multimedia module incorporating Gagne's nine events of instruction *J Educ* 2014;2(1):1–16.
10. Amir LR, Tanti I, Maharani DA, Wimardhani YS, Julia V, Sulijaya B, *et al.* Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Med Educ* 2020;20:392.
11. Ashraf M, Ashraf S, Ahmed S, Ullah A. Challenges of online learning during the COVID-19 pandemic encountered by students in Pakistan. *J Pedagog Sociol Psychology* 2021;3(1):36–44.
12. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, limitations and recommendations for online learning during COVID-19 pandemic era. *Pak J Med Sci* 2020;36 (COVID19-S4):S27-31.
13. Zibold J, Gemert JA, Reik LJ, Keidel LM, Graupe T, Dimitriadis K. Adaptations to mentoring and peer mentor training at the medical faculty during the COVID-19 pandemic. *GMS J Med Educ* 2021;38 (1):Doc8.
14. Wilcha RJ. Effectiveness of virtual medical teaching during the COVID-19 crisis: Systematic review. *JMIR Med Educ* 2020;6(2):e20963.
15. Mian A, Khan S. Medical education during pandemics: A UK perspective. *BMC Med* 2020;18(1):100.
16. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat K, Al-Balas H, Aborajoo EA, *et al.* Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: Current situation, challenges, and perspectives. *BMC Med Educ* 2020;20(1):341.
17. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat K, Al-Balas H, Aborajoo EA, *et al.* Correction to: Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. *BMC Med Educ* 2020;20(1):513.
18. Fidalgo P, Thormann J, Kulyk O, Lencastre JA. Students' perceptions on distance education: A multinational study. *Int J Educ Technol High Educ* 2020;17:18.
19. Ahmed H, Allaf M, Elghazaly H. COVID-19 and medical education. *Lancet Infect Dis* 2020;20(7):777–8.
20. Lee ICJ, Koh H, Lai SH, Hwang NC. Academic coaching of medical students during the COVID-19 pandemic. *Med Educ* 2020;54(12):1184–5.
21. Surkhali B, Garbuja CK. Virtual Learning during COVID-19 Pandemic: Pros and Cons. *J Lumbini Med Coll* 2020;8(1):2.
22. Pei L, Wu H. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Med Educ Online* 2019;24(1):1666538.

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