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ORIGINAL ARTICLE

Effectiveness of zoom-based online sessions in developing research skills among geographically distant participants: a cross-sectional study

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ABSTRACT

Objective: To evaluate the effectiveness of Zoom-based online meetings in enhancing research skills among geographically distant participants.

Methods: This descriptive cross-sectional study analyzed data from the "Certification in Clinical Research (CCR)" course, conducted from November 2023 to May 2024 in Karachi, Pakistan. Ethical approval was obtained from Ameen Medical and Dental Center (Ref# ERC-CIRS-2023-656). The course included five bi-weekly online sessions on various aspects of clinical research, delivered via Zoom. A total of 177 participants from diverse medical fields attended, using personal computers for synchronous learning. Each 120-minute session featured presentations, interactive discussions, and a Q&A segment. Participants provided feedback through a structured questionnaire assessing presenter quality, content, technology, and information on a 5-point Likert scale. Data were analyzed using SPSS version 26.

Results: Of the 177 participants, 20% were new to online learning. Overall feedback was positive, with mean ratings of 4.5 for presenters, 4.3 for content, 4.0 for information, and 4.3 for technology. Presenters in session 1 received the highest rating (4.7±0.5), while technology in session 2 had the lowest (3.4±1.2). Around 60% of participants revisited recorded sessions, with the highest watch time reaching 340.5±25.5 minutes. Participants actively engaged, with an average of 675.3±22.4 chat posts per session.

Conclusion: Zoom-based online meetings were highly rated by participants, fostering collaborative learning through active engagement and facilitator interactions despite minor technical challenges. Session recordings benefited both absent participants and content review. Further research is required to assess long-term skill retention.

Keywords: Research (MeSH); Education (MeSH); Distant learning (Non-MeSH); e-learning (Non-MeSH); Education, Distance (MeSH); Online Learning (MeSH); Webinar (Non-MeSH); Research skills training (Non-MeSH); Synchronous learning (Non-MeSH); Learning (MeSH).

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INTRODUCTION

The integration of digital technology into education represents a significant advancement in modern teaching. Recently, some factors have enhanced the progression of both number and forms of online learning sources accessible to online learners. Speed of internet connections and progressing technology are two important forms. A significant support for online learning is Computer-mediated communication (CMC) systems.[1] There are two main types of CMC, asynchronous communication and synchronous communication Communications which occurs outside of real time are called "Asynchronous communication" e.g. e-mail message, discussion forms. While those in real-time are called "synchronous communication" e.g. chat sessions.[2] Online tools have become an important consideration in online learning technologies for the reason that online meetings are real-time synchronous communication and they enhance the interaction between participants in any online learning setting.[3,4]

In Pakistan, the online based learning was not very common before pandemic COVID-19 due to lack of technology and awareness. However, its usage increased during pandemic and a lot of people enrolled in different online courses, not only in Pakistan but all around the world.[5] Nevertheless, online learning comes with different challenges especially in developing country like Pakistan. Some of them are hurdle in understanding learning mode, logistics problem and internet connectivity issues. People and organizations learnt a lot from COVID-19 and tried to improved online learning experience for participants and students. The pandemic highlighted these challenges but also provided opportunities for improvement. While advancements were made to enhance the online learning experience, there remains a significant gap in understanding the specific relevance of these tools in contexts like clinical research training. Literature focusing on the use of online learning technologies for developing clinical research skills remains scarce, leaving a need for research-based insights to effectively integrate these tools into medical education.[5,6]

To bridge this gap, this study was designed to assess participants' perceptions of online learning experiences, specifically in developing research skills through Zoom-based sessions. By providing evidence of online learning technology's effectiveness in a local context, the study aims to raise awareness of its

benefits for students and educators. Effective implementation of online learning tools can enhance student engagement, increase satisfaction, and improve communication between faculty and students, ultimately contributing to better learning outcomes. The findings of this study can help refine distance learning methodologies, enhance their delivery, and promote broader accessibility in future online courses.

METHODS

This descriptive cross- sectional survey-based study included the data extracted during research course of "Certification in Clinical Research (CCR)" conducted from November 2023 to May 2024 from Karachi, Pakistan. The ethical approval for this study was obtained from Ameen Medical and dental center (Ref#ERC-CIRS-2023-656).

The course has total five online sessions about clinical research, once in two weeks (session 1: course overview, topic selection; session 2: Literature Search and Hypothesis; session 3: Research design, sampling techniques and sample size calculation, session 4: Introduction to SPPS and application of common statistical test, session and 5: Manuscript Writing). Total 177 participants from different medical fields all over the world participated in the course and all of them were able to communicate in English. These online lectures were held weekly from 15:00 to 17:00 (Pakistan Standard Time). All sessions were delivered by different faculty members and subject specialists in English language. The participants, facilitators and the presenters used their personal computers. All online meeting sessions were conducted in a real time (synchronous communication) using ZOOM software.[7] Participants were advised to download ZOOM software from the links provided through e-mails. All attendees issued a user name and password for joining the session.

The two-hour online meeting included a presentation with detailed description of the topic by facilitators. Although facilitators can show his/her real time video during the session but only PowerPoint slides and voice were broadcasted so that participant who have less internet speed (bandwidth) have the same learning experience as the high-speed internet connection. A side chat window was present where participants asked different questions as well as engage with collaborative learning / discussion with facilitators and other participants. Participants can ask questions during the session by typing their questions or replying to facilitator question in chat window. During the session, presenters asked different questions to engage audience as well as to check their understanding and discussed their comments/questions with their names. At the end of session, there was around 15 minutes question and answer session where all unanswered questions were answered. In few sessions, microphone of the participants was also activated so that they can ask questions verbally and can interact as physical session. After each session, some information in written form (PDF files) were also shared with participants for revision and insights of the session as "Resource Materials".

On exiting the session, a predefined automatic form was sent to participant for feedback of the session regarding quality of presenter, contents of the session, technology and information provided (rating 1-5) in the session with open end comments section. The Cronbach Alpha value was 0.76, ensuring its internal consistency. Feedback was made mandatory for all the participants for the final course certificate for compliance. All sessions were recorded on the server password protection (individual user name and password). Participants who missed the session were able to watch the recording afterward. It was observed from the log that not only the absent participants watched the recording but other also watched it multiple times after the session to learn more.

Data was analyzed by using SPSS version 26. Descriptive statistics was used to summarize results. View time of each session recording, number of chat post in each session, rating of presenter, content, Technology and information were presented in mean and standard deviation.

RESULTS

Total 177 participants from geographically different location took part in this online research course (CCR). For 20% of the participants, these online meetings were first experience of distant learning. Most of the participants considered online sessions as a very good learning tool as most of the mean values are above 4. They rated the all four domains (presenter, contents, information provided and technology) with mean rating of more than 4 with rating scale of 1-5 (1 is poor and 5 is excellent). The highest rating score given to presenter during session 1 with mean of 4.7±0.5 and the lowest score 3.4±1.2 for technology. All of feedback is shown in Table I.

Participants ask questions from the facilitators as well as engaged among themselves in collaborative learning discussion using class room feature of ZOOM session. The whole chat log is presented in Table II. The largest numbers of chats were observed in second session with the mean 875.2± 25.4 posts. Each online session was around 120 minutes. Recording was viewed by around 60% of participants. Most viewed session was first one which was seen for 340.5±22.9 minutes which correspondent to more than 56 hours of live session.

The open-ended comments by participants were also very encouraging about their experience of live online sessions. Few feedbacks are as follows:

"It was good and engaging I would have loved if it had continued for 5 more hours"

"It was a great experience! It helped me learn about a lot more things than I already knew about. The facilitator was well informed and had sound knowledge about the subject. The questions were answered promptly and interest was generated amongst all the students. It felt great to be part of this session. There could not have been a better start. Very comprehensive indeed."

Despite a good learning experience, some of the participants also faced power failure during session. One of the participants reported:

"Little bit of problem was experienced because of electricity/ISP services but it is acceptable in Pakistan. Questions should be answered in the end as it

Table I: Rating provided by the participants of online research course

Session details	Presenter Rating		Content Rating		Technology Rating		Information Rating	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Session 1	4.7	0.5	4.3	0.7	4.0	0.8	4.4	0.5
Session 2	4.6	0.8	4.4	0.8	4.3	1.2	4.3	0.9
Session 3	4.5	0.6	4.4	0.7	4.1	0.9	4.5	0.6
Session 4	4.5	0.8	4.6	0.8	4.2	0.8	4.5	0.6
Session 5	4.4	0.8	4.1	0.8	4.3	0.9	4.3	0.5

Table II: Chat post and time duration of recording watched by participants (n=177)

Session details (each session 120 min)	Chat posts	Recording view time (minutes)
	Mean±SD	Mean±SD
Session 1	836.6±8.6	340.5±22.9
Session 2	875.9±12.3	112.3±15
Session 3	584.7±16.9	141.9±11.2
Session 4	636.4±18	163.2±12
Session 5	442.7±3.2	117.5±15.6

serves to be a big distraction for speaker"

"Although I had spent a whole two hours in the morning reading the 'Rules of the game'& information provided in the "Resource Materials" page and also went through the Handout pdf file thus it made following the online lecture much easier because the online meeting actually explained all of the material already given plus a lot more. Being an interactive session, it made the experience much livelier and enjoying rather than keeping all my queries in mind and asking at the end. Looking forward to more".

DISCUSSION

A distant learning experience is much different compared to face-to-face classroom learning as there is no personal contact with students, body language cannot be used and it's difficult to develop a personalized learning experience especially in comparatively large group. However, results of this study showed that presenter, presentation contents and information provided was satisfactory for participants considering the ratings for all components. Most of the participants were very satisfied with the learning experience. Their queries were responded adequately. They all were sitting miles away and despite this, they experience a good interaction with the learning contents as well as facilitators. The substantial number of chat posts during the session indicates high participant engagement and suggests that synchronous tools enable active interaction between learners and facilitators.

Many researchers have started doing work and research on synchronous communication. Contrary to our findings, an investigator found a substantial difference in overall achievement outcomes between classroom teaching and e-learning.[8] The various approaches that were used might be the cause of this discrepancy. The majority of earlier research compared asynchronous e-learning to classroom teaching in their meta-analysis study. Online meetings are being used to continue teaching and learning since the COVID-19 epidemic has disrupted traditional medical education worldwide. According to a survey, there was a more than 300% growth in the use of online meeting/ virtual learning in 2020 compared to the same period in 2019.[9]

During the outbreak pandemic, Edward Christopher Yo et al. noted that the usage of online meeting for health workers training in Indonesia was well-received.[10] Additionally, Bhattarai et al. noted that virtual learning was a very useful tool for medical education, especially when social distance was required. The results of the current investigation are consistent with those of the previously stated studies.[11] Presenters may convey their content with an audience virtually by online meetings, even if they are not physically there.[12] As a result, an online meeting provides a variety of participatory options, such as testing, polling, and asking questions.

Synchronous online instruction offers a special benefit that is comparable to traditional training in that it may offer quick feedback and instructional assistance.[13] In addition, it offers benefits over traditional training in terms of logistics, instruction, and cost. The practical benefit of the online learning format is that it allows participants to engage in the learning process from any place. The budgetary benefit of the distant learning format is that it reduces travel expenses while yet enabling real-time contact between teachers and students. Another educational benefit of this format is that it gives participants the chance to use rich multimedia materials.[14] In the present study, the most significant advantage of this online course was that instant response by direct window chat and question answer sessions to facilitate them in correcting their mistakes immediately.

There are certain limitations of this study. First, it was a survey-based study and reported findings were highly dependent on participants' response. Therefore, it was prone to response and recall bias which may lead to over estimation of the results. Additionally, some technical issues like electricity failure might influence the experiences of the participants and reduce the

generalizability of the findings. Lastly, this study was conducted only for one course on one software. Due to absence of comparative group, it is difficult to summarize the effectiveness of a single software for online learning. Future comparative studies on large scale with different advanced and customized software are recommended to explore the effective of online learning in depth. However, the findings of this study will serve as frame work for future studies on similar topic.

CONCLUSION

This study demonstrates that Zoom-based online meetings effectively enhance research skills among geographically distant participants, with high overall satisfaction reported. The interactive nature of the sessions, facilitated by collaborative learning and real-time query resolution, contributed to a positive learning experience. Despite minor technical challenges, online learning methods prove to be a viable option for teaching clinical research skills to remote participants. Further improvements, such as integrating breakout rooms for small group discussions, employing gamification techniques, and incorporating pre-session assignments, can enhance engagement and learning outcomes. Future research should explore long-term skill retention and the optimization of digital education strategies in medical training.

REFERENCES

1. Choi M, Choung H. Mediated communication matters during the COVID-19 pandemic: The use of interpersonal and mass personal media and psychological well-being. J Soc Pers Relatsh 2021;38(8):2397-418.https://doi.org/10.1177/02654075211029378
2. Jhala M, Menon R. Examining the impact of an asynchronous communication platform versus existing communication methods: an observational study. BMJ Innov 2021;7(1):68-74. https://doi.org/10.1136/bmjinnov-2019-000409
3. Watts L. Synchronous and asynchronous communication in distance learning: A review of the literature. Q Rev Dist Educ 2016;17(1):23-32.
4. McMahon CJ, Tretter JT, Faulkner T, Kumar RK, Redington AN, Windram JD. Are e-learning Webinars the future of medical education? An exploratory study of a disruptive innovation in the COVID-19 era. Cardiol Young 2021;31(5):734-43. https://doi.org/10.1017/s1047951120004503
5. 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–S31. https://doi.org/10.12669/pjms.36.COVID19-S4.2785
6. Adedoyin OB, Soykan E. Covid-19 pandemic and online learning: the challenges and opportunities. Interact Learn Environ 2023;31(2):863-75. https://doi.org/10.1080/10494820.2020.1813180
7. Leslie HJ. Trifecta of Student Engagement: A framework for an online teaching professional development course for faculty in higher education. J Res Innov Teach Learn 2020;13(2):149-73. https://doi.org/10.1108/JRIT-10-2018-0024
8. Ngo J, Ngadiman A. Investigating student satisfaction in remote online learning settings during Covid-19 in Indonesia. J Int Comp Educ 2021;1:73-95. https://doi.org/10.14425/jice.2021.10.2.0704
9. Sims L, Sims L. Webinars. Effective Digital Learning: Transforming Traditional Learning Models to a Virtual World. Apress 2021;55-66. https://doi.org/10.1007/978-1-4842-6864-3
10. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat K, Al-Balas H, Aborajooh EA, et al. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. BMC Med Educ 2020;20:1-7. https://doi.org/10.1186/s12909-020-02257-4
11. Ismail II, Abdelkarim A, Al-Hashel JY. Physicians' attitude towards webinars and online education amid COVID-19 pandemic: When less is more. PLoS One 2021;16(4):e0250241. 1. https://doi.org/10.1371/journal.pone.0250241
12. Yo EC, Witjaksono AN, Fitriani DY, Werdhani RA, Parikesit D. Assessing webinar outcomes for health professionals: a perspective from Indonesia during coronavirus disease 2019 pandemic. Korean J Med Educ 2021;33(2):87–96. https://doi.org/10.3946/kjme.2021.190
13. Bhattarai D, Sharma A, Sengupta P. Utility and perceptions about web-based academics among physicians during COVID-19 pandemic. J Family Med Prim Care 2021;10(2):699-705. https://doi.org/10.4103/jfmpc.jfmpc_2041_20
14. Regmi K, Jones L. A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education. BMC Med Educ 2020;20:1-18. https://doi.org/10.1186/s12909-020-02007-6
15. Dost S, Hossain A, Shehab M, Abdelwahed A, Al-Nusair L. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. BMJ Open 2020;10(11):e042378. https://doi.org/10.1136/bmjopen-2020-042378
16. Sügümlü Ü, Aslan S. The Use of Web 2.0 Tools in Mother-Tongue Instruction: Teachers' Experiences. Int J Educ Literacy Stud 2022;10(1):124-37. https://doi.org/10.7575/aiac.ijels.v.10n.1p.124

AUTHORS' CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

MJ: Conception and study design, drafting the manuscript, approval of the final version to be published

ZAK: Acquisition of data, drafting the manuscript, approval of the final version to be published

ZM: Analysis and interpretation of data, critical review, approval of the final version to be published

RAK: Conception and study design, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request

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