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Seeing Through the Lens of The Instructor: Experience of an Online Asynchronous Course for Undergraduate Medical Students During the Covid-19 Pandemic

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ABSTRACT

Objective: To explore the experiences of medical teachers regarding the development and implementation of an online asynchronous course in Forensic Medicine during the COVID-19 pandemic.

Study Design: Qualitative exploratory study

Place and Duration of Study: Islamic International Medical College, Rawalpindi, Pakistan, from Apr to Aug 2021.

Methodology: Nine faculty participants were selected for semi-structured interviews using convenience sampling. Data was collected through a validated questionnaire with five open-ended questions. The data was transcribed, and manually analyzed using an inductive approach. Open codes were combined to form categories, while themes were generated after constant comparison of codes.

Results: Four major themes emerged during the analysis: 1) course development, 2) course implementation, 3) course evaluation, and 4) future endeavors.

Conclusion: The themes that emerged highlight the adaptability and effectiveness of asynchronous learning, the importance of collaborative content selection, the challenges and opportunities in course implementation and evaluation, and the future aspirations for improving this mode of instruction.

Keywords: Asynchronous Learning, COVID-19, Medical Education, Forensic Medicine.

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INTRODUCTION

Teaching and learning in medical education have undergone a paradigm shift in the twenty-first century. During COVID-19, effective pedagogy in the online context received more scholarly interest than before.[1] Technological improvements enabled medical institutions to offer online courses. Harden and Hart have described the advantages of online learning in removing barriers to learning and expanding opportunities. The literature on medical education is blossoming with research on online teaching and hybrid courses.[2] There is an acknowledged requirement to equip medical faculty with tools for online teaching, and numerous faculty development models are being adopted with varying emphasis on technology, pedagogy, and course content.[3]

Online learning is a process of gaining knowledge through electronic technologies. Typically, it is delivered through the internet, allowing students to access their learning at any time, and from any location, they can access course materials.[4] There are three kinds of e-learning environments: synchronous, asynchronous, and blended. Asynchronous learning enables flexibility for students and teachers by allowing students to select the time for learning and freeing up teachers' time to concentrate on topics requiring closer supervision.[5] Medical educators have made critical instructional decisions regarding the delivery of online asynchronous courses and adapted their teaching approaches to the online setting in the past few years. Teachers' roles are skewed toward facilitating and designing autonomous learning experiences.[6] While there is an appreciable understanding of the benefits of asynchronous teaching, little is known about developing and implementing asynchronous courses in undergraduate medical education.[7] The age of technology is reshaping the way knowledge is disseminated and accessed.8 As thelearning environment of medical schools becomes more digitally advanced, the era of thechalkboard, PowerPoint presentations, and hour-long lectures is slowly fading.[8,9] A growingbody of evidence suggests that not only is asynchronous education preferred by students, butit is also effective.[9] To date, most studies on computer-based learning indicate that there is no discernible difference

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between traditional classroom training and asynchronous, computer-based instruction.[10] Experimental studies comparing the effectiveness of an asynchronous,computer-based course to traditional classroom instruction in evidence-based medicine discovered that the former was equally successful at enhancing student knowledge as the latter.[10] The value of asynchronous case-based learning in pathology demonstrated an increase in acquired knowledge of the participants.[11] Web-based learning (WBL) modules have been shown to improve head computed tomography scan interpretation among the medical students in an emergency medicine scenario.[10] Other research in pathology, radiology, emergency medicine, and gyneco-pathology have demonstrated a similar effect between classroom training and asynchronous,computer-based instruction.[11-13] Web-based learning (WBL) modules have been shown to improve head computed tomography scan interpretation in an emergency medicine scenario.[14] A flipped-classroom approach has been used to improve student involvement and interaction at Agha Khan University during the endocrinology module. They proposed implementing this paradigm in undergraduate medical courses.[15] We aimed to explore the experiences of medical teachers regarding the development and implementation of online asynchronous courses in Forensic Medicine at Islamic International Medical College (IIMC) for third year MBBS students.

METHODOLOGY

This exploratory qualitative study was carried out from April to August 2021 at Islamic International Medical College, Rawalpindi, Pakistan after approval of the Institutional Ethical Review Committee (Riphah/IIMC/IRC/21/25).

Inclusion Criteria: Faculty members of either gender from the Forensic Medicine department, at academic ranks of senior lecturers, assistants, associates, and professors, or any age group were included.

Exclusion Criteria: The faculty of Forensic Medicine who did not participate in the course development and implementation were excluded.

The Consolidated Criteria for Reporting Qualitative Studies (CRQS) were used to report study methodology.[16-18] Non-probability purposive sampling was used to select the participants, and informed consent was taken. The goal was to collect as much information as possible about the research questions. Data was gathered through semi-structured interviews conducted via the Zoom platform.

The sample size was determined by data saturation, where new information and themes were no longer emerging from the interviews. Semi-structured interviews were conducted with the participants to gather rich, descriptive data about their experiences, challenges faced, and strategies employed during the course development and implementation process. Seven questions were finalized after literature review and critical appraisal of selected research articles.[1] How did you design the online asynchronous course?[2]. Why do we need to adopt online asynchronous mode of teaching in Forensic Medicine?[3]. software's were used in developing the asynchronous course and how they helped in teaching the content?[4] What were the challenges faced during development of the course?[5] What were the challenges in implementation of the course?[6] How did asynchronous course affect learning process of your students? Do they become self-regulated learners?[7] Do you have any additional ideas and comments based your experiences of this course?).

Interview questions were sent to four expert medical educationalists. Changes were made in response to their feedback. Interview questions were pilot tested with one faculty member who fulfilled the criteria of sampling. The interviews were carried out in the presence of the primary investigator (PI). Each interview lasted approximately 45 minutes. The interviews were audio-recorded and transcribed verbatim through otter.ai software to ensure accuracy and facilitate data analysis. Thematic analysis was employed to identify patterns, themes, and categories within the interview data. The analysis followed a rigorous process of familiarization with data, coding, generating initial themes, reviewing and refining themes, and finally organizing the themes into a coherent narrative. Thematic analysis was done in three rounds.[18] During the first cycle, open coding was done by breaking the data into chunks. In contrast, core categories were created during second round with constant comparison of codes. During third round that generated themes after connecting main concepts. Direct quotes were used to illustrate the conclusion and show the various ways in which comments were presented.

Trustworthiness of the findings was ensured through member-checking, where participants were provided with the opportunity to review and validate

the results, and note-checking was done by the PI. Ethical considerations were upheld throughout the study. Confidentiality of participants and their anonymity were maintained during data collection, analysis, and reporting.

RESULTS

We conducted nine semi-structured interviews of faculty members, out of which three were professors, one was an assistant professor, one senior lecturer and four lecturers. Seventy-nine open codes were identified after analyzing the data and that were further classified into 21 categories, and related categories were merged and distilled into four main themes: course development, implementation, evaluation, and future endeavors.

Theme 1: Course development

Introduction of asynchronous course in Forensic Medicine.

During COVID-19 pandemic, university added technology-enhanced learning for undergraduate medical students in which asynchronous course was introduced as an innovation to manage the contact hours of Forensic Medicine. Faculty and participants found this innovative teaching method valuable.

Respondent 1 said: "Because of this pandemic, teaching mode was shifted to online. The innovative teaching with technology use served the purpose."

Respondent 2 added: "There are few topics which can be taught effectively through asynchronous mode, it is time to decide what to focus and how to deliver content."

One participant described how they got help from an instructional IT workers.

Content selection for learning objectives

Faculty engaged in collaborative planning to select the content. Since the students were already being taught online, making an asynchronous course provided them an interesting and flexible mode of learning. They focused on the cognitive domain and alignment with the constructive principles.

Respondent 8 added: "We probably did three to four meetings to plan the course. We were also communicating via e-mail on an as-needed basis."

Respondent 5 said: "A course design which is based on constructivism is essential to online learning for adult learners So, our decision was to include cognitive domain only".

Respondent 1 mentioned, "I plan learning objectives after content selection."

Technology platform

This theme explained the software's used by the faculty during asynchronous course development. Moodle was the primary platform for asynchronous learning activities in the course supported by LOOM for recording lectures. All students and faculty were enrolled with IDs and passwords in Moodle. Screencast of the PowerPoint presentation along with face of the instructor teaching the content, was recorded.

Theme 2: Course implementation

Creating PowerPoint slides

The PowerPoint slides were updated according to the requirements of asynchronous mode such as reduced interaction between teacher and learner.

Respondent 1 said: "For online mode, making PowerPoint slides is compulsory, I needed to work on my previous slides for improvement and keeping the asynchronous mode in mind, changed the content of slides with some additions and deletions."

Participant 5 said "…. and later the presentation was updated for recording. A combination of recorded lecture, link to reading material, articles with related videos on post-mortem changes and discussion of quiz in forum was enough content."

Rehearsing lectures

Participants found that practice and rehearsal were crucial for successful asynchronous teaching, despite the additional time commitment.

Respondent 2 said: "Practicing the lecture is the only way to keep the asynchronous mode of teaching successful. But this needed more time, extra from the usual workload. I rehearsed for my first lecture twice before final recording."

Lecture recording

The faculty shared the experience of recording lectures and went through rehearsal before the final recording. This needed extra time apart from usual workload.

Respondent 1 added: "I recorded lectures using Loom, which screencast the PowerPoint and small icon of my face video on it, in order to help students, gain a deeper understanding of the material and to increase their engagement with the course content."

Respondent 4 said: "Recording of lecture is a new and additional feature that requires expertise to use software offered by the university."

Online Feedback

The faculty encouraged students to use Moodle for lectures and provided guidance for using it.

Respondent 9 added: "I convinced students to use the Moodle and take lectures. I reminded them that it was essential. I have written them a message and short video was uploaded for them to explain how to do it."

Respondent 8 said: "It would be different if our students were in campus for giving feedback on asynchronous learning and discussing the queries in their learning of the post-mortem changes. But they give the assessment and got their feedback promptly."

Challenges faced

The participants explained the challenges faced such as time for content preparation and learning new technology for teaching and learning.

Respondent 1 mentioned "It took a lot of time to put content online as well as learn all the technology involved."

Constant support from institution

One of the principal factors experienced and highlighted by the faculty was the constant institutional support. It was critical to the smooth implementation and success of the course. They explained many ways in which administration supported their asynchronous course development and implementation like training of software, online teaching skill development workshops and operational support.

Respondent 7 added: "The widespread expansion of online medical education necessitates institutional support for online course development, implementation, and maintenance. The university provided trainings for developing lectures and using Moodle along with round the clock assistance regarding software related issues."

Theme 3: Course evaluation

Challenges faced

Respondent 2 added: "It is compulsory to involve students by using different approaches like discussions, question/answer session on Moodle."

Respondent 2 said "For a course to be successful, interactive teaching is necessary as the students get bored and lose their interest in a forty-minute lecture. Student involvement was challenging."

Faculty experience

The faculty shared positive experiences in terms of innovation, technological growth, and institutional support during asynchronous teaching and learning, regarding the course a chance to strengthen their abilities and skills.

Respondent 3 said: "It was about teaching as well as learning. I think I improved much in technology. It was one fine experience for me, the support from everyone was appreciable."

Respondent 2 added: "As far as my own learning went, I appreciated learning about technology and how to support students in a variety of locations while facilitating in an online course."

They reported that the course involved developing new abilities in the usage of asynchronous technology as well as how to facilitate through such means.

Respondent 3 said: "This course is useful for the future. After improving it we can use it in Forensic Medicine teaching. Students need to be trained for asynchronous mode of learning as well."

Impact on students

Participants noticed self-regulation and self-direction in their learners, which may have come about as a result of asynchronous learning, while it was still too early to draw any firm conclusions. Completing the course in the given time, along with the routine classes showed that their students used self-pacing and were self-directed avoiding the distractions.

Respondent 1 said: "It's too early to say that, but adult learners are self-paced. I see they regulated themselves during this course and completed the quiz on time, at least most of them."

Respondent 8 added: " I think at this time, it is not possible to say with surety, but self- regulation must have developed that they accomplished learning tasks."

Theme 4: Future endeavors

Course enhancement

Faculty members talked about their future ideas and methods for enhancing and improving asynchronous courses, with a particular focus on content, assessments, and overall course design.

" we want to improve the course's structure and content to increase students' engagement and effectiveness." (Respondent 9)

Student preparation

Faculty took into account the need to provide resources and advice on how to succeed in such courses, as well as the need to properly prepare students for asynchronous learning.

"We intend to prepare better and support students as they transition to an asynchronous learning environment." (Respondent 3)

Further research and development

Participants expressed a desire to study more about asynchronous teaching strategies and how they affect Forensic Medicine learning among students.

"The future will benefit from this course. We will utilize it in Forensic Medicine instruction once we have improved it, and we also intend to look into more research opportunities in this field." (Respondent 9)

Training of Faculty

Faculty members understood how important it was to continue their professional growth and training in order to deliver asynchronous courses more effectively.

"To ensure that we can successfully adapt and develop in the realm of asynchronous education, we want to engage in faculty training." (Respondent 7)

DISCUSSION

The primary objective of this research was to gain a deeper understanding of the experiences of educators in the context of online asynchronous courses. The four themes that emerged from our exploration are discussed in this section. The results obtained from interviews with faculty members revealed a consensus regarding the importance of this pedagogical innovation. Overall, it was satisfactory and our findings fit the literature on e-learning.[19]

The theme Course Development emphasized implementing asynchronous learning as a strategy to confront the difficulties presented by the COVID-19. The respondents recognized the importance of transitioning to online learning. They further emphasized the pivotal role of technology-enhanced learning approaches, specifically asynchronous courses, played in facilitating this change. Steps of asynchronous course development can be seen in the Figure.

The participants conveyed their appreciation for asynchronous teaching methods, placing particular emphasis on the flexibility and efficacy within distinct contexts. The implementation of collaborative content selection by faculty members was significant. This process was employed to determine the course content, with an emphasis on the cognitive domain and adherence to constructivist principles. The strategy enabled development of a comprehensive, student-centric course. Furthermore, the selection of technological platforms, including LOOM and Moodle, was pivotal in the development of asynchronous courses.[20,21] Moodle is a user-friendly online learning management system used by universities worldwide. Several studies have discovered online tools and technical implementations for organizing virtual courses.[21] Most studies mentioned zoom and web-based conferencing as online lecturing tools.[22-24] The objective of incorporating screencasts into lectures was to augment students' comprehension and involvement with the subject matter.

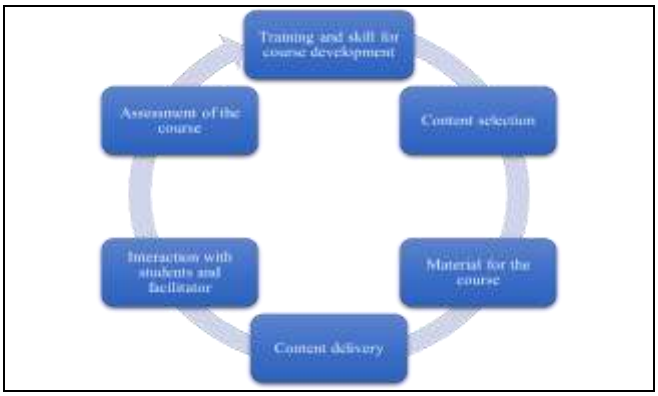

Figure: Steps in Asynchronous Course Development

The second theme, Course Implementation, pertains to the pragmatic considerations faculty members have regarding the delivery of asynchronous courses: the implementation steps, significance of online student feedback, function of lecture recording, value of practice and rehearsal, strategies to improve the quality of asynchronous courses, and the difficulties associated with course implementation.

Faculty members emphasized steps that must be undertaken to ensure the successful implementation of asynchronous courses. The importance of modifying conventional instructional resources, including PowerPoint presentations, to accommodate the asynchronous learning setting was underscored.[25] Furthermore, they acknowledged the significance of reducing in-person classes as a result of the asynchronous format of the course, recognizing that this strategy should be opted for the specific

requirements of the program.[25] Faculty members emphasized the dedication necessary for comprehensive preparation and practice and rehearsal of the session before recording. This commitment is regarded as critical for the effective transmission of asynchronous course lectures to students, guaranteeing that the material is captivating and worthwhile.

The utilization of lecture recording has become an essential element in the implementation of courses conducted in asynchronous environments as mentioned in the literature. Faculty members were required to modify their instructional approaches and utilize novel recording technologies to deliver their lectures effectively.[25] Notwithstanding the preliminary period of adjustment linked to these technologies, participants acknowledged their capacity to augment student engagement and comprehension.

The literature indicated that by implementing constructivist design principles, the caliber of asynchronous courses can be substantially enhanced.[26] The significance of integrating interactive teaching and learning activities, efficient assessments, and prompt feedback in order to foster a more captivating and influential educational environment was underscored by the faculty. Regarding platform usage and online Feedback, participants emphasized the significance of student online feedback. Promoting student engagement in utilizing asynchronous learning platforms (e.g., Moodle) to access course materials and seeking assistance were recognized as critical strategies for fostering effective learning. This methodology promotes student engagement and a sense of community as described in the studies on e-learning.[27,28]

The discourse also encompasses the obstacles that instructors encounter while teaching asynchronous courses.[28] The formidable tasks at hand encompass substantial investment of time for content preparation and acquiring expertise in emerging pedagogical technologies. Nevertheless, the participants remarked that consistent institutional support, which encompassed assistance throughout the day and night and training sessions, was crucial in surmounting these obstacles.[29]

The third theme, Course Evaluation, shed light on the challenges and experiences encountered while assessment of the asynchronous courses. Respondents emphasized the necessity of involving students through various interactive approaches, such as discussions and question/answer sessions on Moodle, to maintain engagement and interest.[28-30] The impact on students, particularly their self-regulation and self-direction, was observed, although further research is needed to draw definitive conclusions. Participants noted that students exhibited self-pacing behavior and were self-directed, potentially due to the asynchronous learning format. Stephen et al. found that persistence in an online class is connected to self-regulated learning, self-directed learning, and online learning self-efficacy. Students without self-regulated learning skills may find asynchronous learning stressful.[30]

The theme Future Endeavors revolves around faculty members' aspirations and plans for enhancing asynchronous courses in medical education. Faculty expressed their commitment to improving course structure and content to increase student engagement and effectiveness.[30] Preparing students for asynchronous learning emerged as a priority, with faculty members recognizing the need to provide resources and guidance to support students' success in this learning environment. Moreover, participants expressed a desire to engage in further research to explore asynchronous teaching strategies and their impact on learning among students.30 Continued faculty training and professional growth were acknowledged as crucial elements to ensure the successful adaptation and development of asynchronous education.

LIMITATIONS OF STUDY

One limitation of the study was sample of faculty, as the department of Forensic Medicine has ten faculty members. Still the data is rich enough to provide a sound basis. Experimental studies of asynchronous courses should opt into the other subjects of the undergraduate medical curriculum. The study occurred during the pandemic, this data can be utilized to advise medical schools on how to improve their online instruction in the future and the event of any crisis, ultimately boosting educational outcomes of medical students.

CONCLUSION

This qualitative study provides valuable insights into the experiences and perspectives of faculty members in developing and implementing asynchronous courses in Forensic Medicine during the COVID-19 pandemic. The themes that emerged highlight the adaptability and effectiveness of asynchronous learning, the importance of collaborative content selection, the challenges and opportunities in course implementation and evaluation, and the future aspirations for improving this mode of instruction.

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Authors' Contribution

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

NUA & SA: Data acquisition, data analysis, critical review, approval of the final version to be published.

RY: Study design, data interpretation, drafting the manuscript, 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.

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