

Qualitative approach to identify the challenges faced and the strategies to overcome during online teaching for medical undergraduates during Covid 19 Pandemic

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Abstract

Introduction& Aim: To identify challenges faced by the students and faculty and the solutions to overcome them on online teaching learning method during lockdown. **Methods:** A descriptive qualitative study of 6 months duration was conducted among the medical faculty and students. Non-probability purposive sampling was employed in the study. Free listing was done initially to elicit the views of faculty and students to meet the intended objectives. Visual Anthropic software was used to identify the salient variables using Smith's Saliency Score (free listing), and then pile sorting was done to identify the association between the salient variables. **Results:** Ten members participated in the free listing and pile sorting. A total of 42 responses were obtained pertaining to the challenges during online teaching, of which 25 were identified as the salient variables depending on the cut-off value of 0.125 (Smith's Saliency Score) and subjected to pile sorting. Similarly, 25 challenges were identified for the solutions to overcome the challenges in implementation of the online teaching programme during the free listing, and all were included in the second stage of pile sorting. Cognitive maps were drawn to understand the relationship between the involved challenges and the solutions to overcome them separately. **Conclusion:** Online education changes all components of teaching and learning in higher education. Three major categories of findings were identified: issues related to online learners, instructors, and content development. Learners' issues included learners' expectations, readiness, identity, and participation in online courses. Instructors' issues included changing faculty roles, transitioning from face-to-face to online, time management, and teaching styles. Content issues included the role of instructors in content development, integration of multimedia in content, role of instructional strategies in content development, and considerations for content development. To address these challenges in online education, higher education institutions need to provide professional development for instructors, trainings for learners, and technical support for content development. Keywords distance education and telelearning, teaching or learning strategies, postsecondary education, pedagogical issues, human-computer interface.

Keywords: Free listing, Pile sorting.

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Introduction

The COVID-19 has resulted in schools shut all across the world. The plan to return students to physical classrooms has suffered a major setback in the last few weeks, with the country witnessing a second wave of Covid-19 cases that is worse than the peak in 2020. Another set of lockdowns seems imminent, with no telling when the situation will be back under control. Two crucial factors have shifted due to the pandemic. First, pedagogical adaptations have proven to be pivotal as the traditional lecturing in-person models do not translate to a remote learning environment. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. The education system and the educators have adopted "Education in Emergency" through various online platforms and are compelled to adopt a system that they are not prepared for.

While adapting to the new changes, staff and student readiness needs to be gauged and supported accordingly. The learners with a fixed mindset find it difficult to adapt and adjust, whereas the learners with a growth mindset quickly adapt to a new learning environment. There are a variety of subjects with varying needs. Different subjects and age groups require different approaches to online learning[1]. Online learning also allows physically challenged students with more freedom to participate in learning in the virtual environment, requiring limited movement[2]. Many students at home/living space have undergone psychological and emotional distress and have been unable to engage productively. The best practices for online home schooling are yet to be explored[3]. With the availability of a sea of platforms and online educational tools, the users—both educators and learners—face frequent hiccups while using it or referring to these tools. Some of the online platforms used so far include unified communication and collaboration platforms such as Microsoft Teams, Google Classroom, Canvas and Blackboard, which allow the teachers to create educational courses, training and skill development programmes[4]. This paper reflects the perceptions of faculty and students regarding challenges faced and the solutions to overcome the challenges during online teaching (via zoom platform).

Objectives

1. To examine the challenges faced by the teachers and students in adapting to the online teaching-learning process during COVID-19 pandemic.
2. To come up with the solutions to the challenges faced, in adapting to the online teaching-learning process during COVID-19 pandemic.

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Study design

This is a descriptive qualitative study.

Study duration

The study was conducted for 6 months (November 2020 – March 2021).

Study area

The study was conducted in the Department of Biochemistry.

Study population

The study population included faculty members of first year departments (Department of Biochemistry, Anatomy & Physiology)

Inclusion and exclusion criteria

The study included five faculty members who took online classes continuously for 6 months and the five students who attended online classes regularly for 6 months. The faculty members who were on leave and who did not participate in online teaching and the student who were not regular for online classes were thus excluded from the study.

Sampling method

The study used non-probability purposive sampling.

Study tool

1. Free listing: To identify the challenges involved during implementation online teaching and the strategies to overcome them.
2. Pile sorting: To establish a relationship between the identified challenges and the strategies to overcome them.

Methodology

The study was started after taking the approval from the Institutional Ethics Committee (SVSMC/IEC ApprovalNo.03/2020) and faculty and student's consent.

Free listing. The study involved two stimulus research questions:

1. What according to you are the challenges faced during online teaching method.
2. What according to you are the strategies to overcome the challenges during online teaching.

The access protocol was developed and information was collected by the principal investigator in a face-to face interaction. At the start of the interaction, a brief and easy instruction was given to the participants about what is expected out of them. The research questions were read to the participant one after the other, and it was

ensured that they understood the question. Further, it was emphasised that the exercise is not a test of their knowledge. Participants were given the option to record their responses on their own in writing (in short sentences). Once the responses were recorded, the investigator reread the same to the participants and ensured that they themselves are clarified about what the participants meant about them. The responses obtained from the participants (both for challenges faced and the possible solutions) were analysed using the Visual Anthropac software to identify those items which are prominent and representative of the cognitive domain. The Smith's Saliency Score was calculated, and depending on the elbow (cut-off) observed, salient variables were selected for the next step of pile sorting.

Pile sorting. This step was done to identify the similarities and differences among the recorded items as perceived by the participants. The idea was to convert a large number of items into specific themes (groups). The free pile sorting method was adopted for the current study, in which the pile sorting was done on a one-to-one basis. The identified salient items were written on the cards (front side), while on the back side numbers were mentioned to enable data entry. Initially, the participants were made to relax by saying that it is a game and not a test of their abilities. All the cards with the item name were placed in front of the participant and they were asked to group them together using their own criteria. It was ensured that the participants understand what is written on the card and they were even asked to read the same for confirmation. Once the groups were formed, they were asked to explain why they grouped them in that particular way and their responses were recorded in the recording format. Also, each time, the pack of cards was shuffled before giving to the next participant. In this step, no probing was done and participants were given the chance to change the pile, if they wish to. The participants were allowed to rearrange the piles. The obtained results or categories were again subjected to analysis using the Visual Anthropac software, and cognitive maps were drawn to identify a meaningful relationship between the salient variables.

Statistical analysis

Qualitative analysis was done, and Visual Anthropac software was used to interpret the results of the free listing and pile sorting

Results

Free listing 1 with a stimulus research question of eliciting the opinion of five faculty members and five students about the challenges faced by them during online teaching mode was done. A total of 25 responses were obtained from ten respondents (table 1), which were then fed into the Visual Anthropac software.

Table 1: Free listing: Selected 25 challenges faced by faculty members and students in the implementation of online teaching in the department from ten participants during covid pandemic

S.No	ITEM	SALIENCY
1.	Network issues	0.252
2.	Fast pace of teachers	0.0054
3.	Disturbance from family members	0.150
4.	Lack of classroom atmosphere	0.0089
5.	Lack of motivation	0.096
6.	No interaction with student and teacher	0.100
7.	More distractions from students	0.100
8.	No time for discussion	0.050
9.	Lack of time management at home	0.080
10.	Security problems using online apps	0.057
11.	Zoom trial version has limited features	0.100
12.	No time to ask doubts	0.067
13.	Repeated login into online portal	0.100
14.	Difficulty to adjust new teaching learning method	0.040
15.	Irregularity to classes	0.060
16.	No attention for slow learners	0.100
17.	Difficulty to understand the topic	0.025
18.	Apprehension to lose clinical touch	0.100

19.	Difficulty in assessing online	0.086
20.	Difficult to concentrate at home	0.060
21.	Lack of peer interaction	0.043
22.	Lack of motivation for faculty	0.100
23.	Lack of animated videos in PowerPoints	0.043
24.	More content in PowerPoints	0.071
25.	Lack of motivation for students	0.020

A Smith Salience Score of 0.125 was taken as the cut-off and 25 salient variables (out of the 42 listed) were selected and eventually subjected to the second stage of pile sorting. On a similar note, free listing 2 was done with an aim to elicit the solutions from ten respondents regarding the probable solutions to overcome the challenges faced by them during online teaching mode in the department. Twenty-five solutions were identified by the ten respondents (table 2), which were subsequently fed into the software.

Table 2: Free listing: Selected 25 probable solutions for the challenges faced during the implementation of online teaching in the department from ten participants during covid pandemic

S.No	ITEM	SALIENCE
1.	Purchasing good internet package	0.075
2.	Small group discussions to be encouraged	0.033
3.	Prior proper planning of the class hours to be done	0.050
4.	Parents should provide space for children during online sessions	0.020
5.	Choosing secured online portal	0.080
6.	Purchase of paid version of zoom	0.020
7.	Videos during lecture should be in on mode	0.083
8.	Video call discussion	0.040
9.	Virtual group activity	0.060
10.	Student orientation to online portal	0.080
11.	Small grouping on zoom	0.040
12.	Use of animated videos to create interest	0.100
13.	Team building activities to be included	0.100
14.	Weekly formative assessments to be conducted	0.100
15.	Encouraging self-directed learning online	0.100
16.	Encouraging problem-based learning online	
17.	Doubts to be explained between the session	0.067
18.	Faculty orientation to online portal	0.100
19.	Online viva	0.060
20.	Assigning teamwork among students	0.020
21.	Activity sessions can be included in the afternoon times	0.017
22.	Motivating sessions from faculty	0.100
23.	Mentoring programme to be included online twice in a month	0.080
24.	Notes and ppt to be shared prior hand to the students	0.040
25.	Framing clear measurable goals by teachers	0.060

A Smith Salience Score of 0.125 was taken as the cut-off and 25 salient variables (out of the 48 listed) were selected and eventually subjected to the second stage of pile sorting. The salient items identified during free listing 1 were used for pile sorting 1. Overall, the items were grouped in three to three to four categories by ten respondents (table 3).

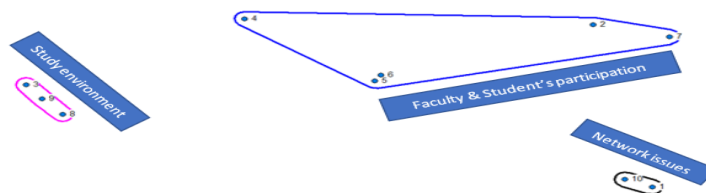
Table 3: Pile sorting to assess the relationship between the identified salient challenges

Respondent number	Pile as formed by Respondent	Reasons for the same
1	Pile 1: 3,5,6,8,9,12,14,17,20 Pile 2: 1,10,11,13,19 Pile 3: 2,6,7,16,22 Pile4: 4,18,21,24,25,15	Students concerns Network issues Faculty concerns Others
2	Pile1 : 1,10,11,13 Pile2: 14,2,4,25 Pile3:4,5,6,16,21,22,23 Pile4: 3,8,20,17 Pile5:2,9,12 Pile6:19	Technology Teaching-learning method Student's participation Faculty participation Time management Assessment
3	Pile1:1,10,11,12,13,15 Pile2:3,8,9,14,16,17,20 Pile3:2,7,6,14,19,21,23 Pile4:4,5,18,22	Technical issues Student's issues Faculty concerns College issues
4	Pile1:1,10,11,13 Pile2:4,5,6,21,23 Pile3:3,8,9,15,20 Pile4:2,7,16,22 Pile5:24,25,12,141	Technical issues Study environmental issues Student's concerns Faculty concerns Teaching-learning methods

	Pile6:7,18 Pile7:19	Psychological issues Assessment
5	Pile1:1,11,13 Pile2: 3,4,12,14,15,18,21,22 Pile3:5,6,8,10,16,17,20,23 Pile4: 2,7,25,24 Pile5:19	Network issues Study environment Quarantine related issues Monotony in t/L method Assessment
6	Pile1:1,10,11,13 Pile2:9 Pile3:3,4,6,7,12,19,23 Pile4:2,16,22,24,25 Pile5:5,8,14,15,17,18,20,21	Network issues Time management Virtual experience Faculty concerns Student's concerns
7	Pile1:3,5,6,8,9,12,14,17,20 Pile2:1,10,11,13,19,4,18,21,24,25 .15 Pile3:2,6,7,16,22	Student's concerns Others Faculty concerns
8	Pile 1:1,10,11,13 Pile2:14,2,4,25 Pile3:4,5,2,6,9,16,21,22,23,12 Pile4:3,8,20,17,19	Technology related Teaching learning method Student's participation Faculty participation
9	Pile1:1,11,13 Pile2:3,4,12,14,15,18,21,22,6,5,1 0,8 Pile3:16,17,20,23,2,7,25,24,19	Network related Study environment Faculty related
10	Pile1:1,10,11,13,9 Pile2:2,16,3,4,7,12,22,24,25 Pile3:14,17,15,19,23,5,8,18,20,21	Network issues Faculty related Student's related

These observations were subjected to pile sorting analysis through the Visual Anthropac software, and a cognitive map was drawn (figure 1).

Figure 1: Cognitive map – Challenges in online teaching mode



The cognitive map revealed the distribution study environment, faculty-student's environment and network issues. Similarly, the salient items identified during free listing 2 were used for pile sorting 2. In general, all ten respondents grouped the challenges in three to four categories (table 4)

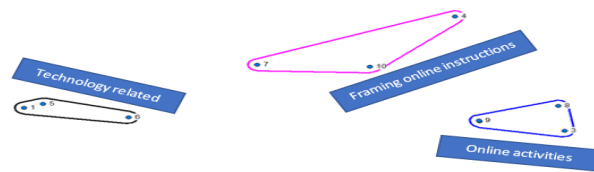
Table 4: Pile sorting to assess the relationship between the identified solutions for the challenges faced

Respondent number	Pile as formed by Respondent	Reasons for the same
1	Pile 1: 1,5,6,7 Pile 2: 24,12,15,16 Pile 3: 2,7,8,9,10,11 Pile4: 13,18,20,21,22,23,15 Pile5:3,2,24,17 Pile6:14 Pile7:11,25	Technology Teaching learning methods Students' participation Faculty participation Time management Assessment Psychological
2	Pile1 : 4,7,10,12 Pile2: 1,5,6,24 Pile3:3,8,11,17,18,19,22,25 Pile4: 2,9,13,14,16,21,23	Student's concerns Network issues Teacher's concerns Others
3	Pile1:1,5,7 Pile2:1,17,21 Pile3:2,3,8,9,11,1`2,13,14,15,16,19,20,24 Pile4:6,10,18,22,23	Technical related Student's concerns Teachers 'concerns College related
4	Pile1:1,5,6 Pile2:2,8,9,11,13,15,16,20,21,23 Pile3:3,12,17,18,22,24 Pile4:4,7,10 Pile5:14,19	Technical related Teaching learning methods related Faculty related Assessment related

5	Pile1:4,7,8 Pile2: 14 Pile3:2,15,16,19,20 Pile4:3,9,10,11,12,13,17,18,21,22,24,23,25 Pile5:1,5,6	Student's related Assessment related Teaching -learning method Time management related Faculty related
6	Pile1:1,6,7 Pile2:10,18,5 Pile3:2,3,8,9,11,12,13,14,15,16,17,19,20,23,24 Pile4:4,21,22,25	Technology related Training program related Teaching learning method Learning environment
7	Pile1:4,7,10,12,15,20 Pile2:1,5,6,24,9,2,13,16,14,21,23 Pile3:3,8,11,17,18,19,22	Students related Technology related Faculty related
8	Pile 1:1,5,6,7 Pile2:8,24,12,15,16 Pile3:2,7,8,9,10,11,25 Pile4:13,18,20,21,22,23,15,3,2,24,17,14	Technology related Teaching learning methods Students related Faculty related
9	Pile1:1,5,7,6,10,18,23,22 Pile2:4,17,21 Pile3:2,3,8,9,11,12,13,14,15,16,19,20,24	Technical related Students participation Faculty participation
10	Pile1:1,6,7,4,21,22,25 Pile2:2,3,8,9,11,12,13,14,15,16,17,19,20,23,24 Pile 3:10,18,5	Internet related Teaching learning method Training program related

Once again, these observations were subjected to pile sorting through the software, and a cognitive map was drawn (figure 2).

Figure 2: Cognitive map – Solution for Challenges faced during online teaching mode



The cognitive map depicted the solution for the challenges faced during online teaching under three broad categories, namely the technology related, framing online instructions and online activities.

Discussion

This paper intend to study the challenges faced by the faculty and students and the strategies to overcome them , during the online teaching during covid 19 lockdown using free listing and pile sorting as a tool. Free listing and pile sorting methods were adopted to obtain the detailed perspectives of the online teaching programme during covid 19 pandemic. The free listing and pile sorting methods have been adopted in different settings in the field of medicine [5-7].In short, these qualitative methods have been adopted to explore the cultural or the cognitive domains about any issue. In the current study, respondents gave due emphasis to the issues faced during online teaching program. Similar findings were reported in studies done by Murgatrottd et al in identifying the challenges with e-learning are accessibility, affordability, flexibility, learning pedagogy, life-long learning and educational policy[8]. Authentic assessments and timely feedback are essential components of learning. A very crucial part of online distance learning is the availability of helpful formative assessments and timely feedback to the online learners[9]. Learners' readiness. Learners' readiness to attend online courses is one of the major issuesLearners' readiness. Learners' readiness to attend online courses is one of the major issu Learners' readiness to attend online courses is one of the major issues. Not all learners can successfully participate in online courses. Identifying and adopting learning styles and skills required to participate in online courses can be challenging for learners (Mayes et al., 2011; Luyt, 2013).We found learners may feel isolated and disconnected in online courses , which may affect their learning. This finding goes with the findings of McNerny & Roberts in their study[10]. Learner's participation and engagement, content development in online settings is another major issue. Instructors may be responsible for preparing and planning materials

for online courses. The task of generating new materials or adjusting the materials from face-to-face classes to an online setting can be very challenging by Li & Irby[11]. Many instructors who teach face-to-face are not interested in teaching online. One of the major issues is that these instructors have been teaching face-to-face for years and do not feel comfortable switching to the online format. This discomfort is the fear of the unknown, or it may be related to the inability to connect with students within the online environmentby Osika, Johson & Buteau[12].The other issue is that instructors of online education preparation programs may not know how to prepare instructors for transition from the traditional face-to-face training to the online teaching .Similar finding was by Baran, Correia, & Thompson in their study[13].Time is another major challenge faced by teachers. It takes quite a bit of time to prepare, plan, and teach an online class [14,15]. It takes faculty two times as long to prepare and teach online than face-to-face, thus spending more time per student to facilitate the class[16].The second free listing was done to identify the solutions for the challenges faced during the process of implementation of the online teaching programme. In our study we found that most of the learners need to be self-motivated and self-directed. Online instructors should be ready to help learners who lack the required learning skills. To help learners, the major aspects or dimensions of readiness should be further clarified. Literature indicated that learners' technical skills related to use of computers and the Internet [17] and their time management skills [18] are considered important for shaping learners' readiness to participate in online courses. To help learners identify the required skills, a useful overarching model with five major readiness dimensions along with an instrument to measure the dimensions was suggested by Hung et al [19]. The five dimensions include self-

directed learning, motivation for learning, computer and Internet self-efficacy, online communication self-efficacy, and learner control [19]. We found interacting with peers is highly beneficial in understanding the topic. This is similar with the findings of wise et al in his study[20]. Additionally, the literature indicates that learners' participation in online discussions can be enhanced by mixing audio or video discussion with online text discussions, which are similar with our findings [21]. Proper orientation programmes is the need of the hour for the teachers to handle online teaching. Often proper training and support has not been provided to instructors who are transitioning course content from face-to-face to online settings [22]. According to our data, animated videos will aid to the online understanding of the student in a better way. Content may be developed based on strategies such as integrating multimedia to enhance the learning experience using constructivist theory principles. Examples of multimedia include learning games, videos, and simulations[23]. Content delivered and the instructional strategies are important. They should be student centred. This is in agreement with Chametzky et al and Luyt et al [23,24]. Collaboration with peers is another strategy to enhance learning and engagement in online courses. Content should include collaborative activities which have corresponding rubrics detailing criteria for interaction and engagement. The best practices recommended for developing content in an online course are a combination of collaborative activities, reflective activities, clear assessment criteria, and integration of technology, which is in agreement with the findings of Niess et al & Gillow et al.

Conclusion

Higher education institutions play a central role in enhancing the quality of online education by providing support for instructors, learners, and content development. Online education will be critical for the future of higher education. Few studies have mentioned the challenges during online teaching since the covid 19 pandemic. But solutions to overcome these challenges have not been addressed. This study with a qualitative approach has bridged the gap and described and delineated major patterns of challenges and focused on the strategies to overcome these challenges, hence taking forward for the improvement in the online teaching methods. We recommended, provide professional developments for online instructors, trainings for students, and adequate support for technical issues and multimedia integration to further enhance the quality of online education. There must be online teaching approaches and online faculty preparation programs considering new strategies to aid in promoting better education for students, as this online teaching medium will continue for a longer time till the covid19 pandemic subsides.

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