

PHARMACY STUDENTS' PERCEPTIONS ON THE USE OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC: ADVANTAGES, LIMITATION AND RECOMMENDATIONS.

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ABSTRACT:

Objective: During COVID-19 pandemic in India, pharmacy colleges began offering online teaching and learning as an alternative to traditional classroom teaching. This survey provides more information about online pharmacy education and learning in perception of students, including its advantages, limitations, and recommendations.

Methods: From February to April of 2021, a qualitative case analysis was performed on 65 students from TMV's Lokmanya Tilak Institute of Pharmacy (LTIP); Kharghar, Navi Mumbai, India – 410210. During study, focused interview and online survey forms were conducted for all participants. Survey data was transcribed and analyzed with help of expert.

Results: These results indicate that students continue to prioritize conventional classroom and laboratory approaches over online learning (OL). During lockdown due to COVID-19, OL was found to be beneficial for students' safety.

Conclusion: Overall the students favored offline learning over OL but some advantages of OL may help to improve the structure of pharmacy curriculum (PC) in online, blended or offline modes.

Keywords: COVID-19, Education, Pharmacy, Undergraduate, Online learning

I. INTRODUCTION:

The worldwide spread of COVID-19 has resulted in closing classroom studies for almost all institutes. And it is no exception for pharmacy education institutions too. Thus about every country has moved to a completely online learning mode for their courses and teaching programs. Many educational institutions in India including pharmacy colleges have introduced a kind of online learning (OL). This virtual class has played a crucial role in minimizing spread of virus among pharmacy teachers and student communities.

Before pandemic, common and student-centered teaching methodologies were used in Pharmacy Curriculum (PC). It includes didactic lectures, workshops, seminars, and laboratory sessions. But the lockdown situation due to COVID-19 put pharmacy institutions to few major challenges. Those challenges are in terms of their readiness to cope with a crisis that necessitates the use of technology. So faculty of colleges had to face problems to design curriculum, to deliver their lectures, to conduct examinations, and to adapt other required online teaching-learning related activities¹.

On the other side, many other difficulties were faced by students and their families like the effects on students' mental health, learners' lack of enthusiasm, and difficulty in adjusting to online learning approaches. In addition to that, technological and bandwidth issues were faced by many. Few families have been going through additional economic burdens because of the imminent and high demand for electronic devices and provision of internet.

Here important necessity is standard of teaching and learning should be equal in both offline and online ways. And the achievement of learning objectives should not be jeopardized. Therefore, pharmacy institutions have grown for online teaching-learning.

This institutional evolution includes the use of technology to direct, plan, and distribute learning materials, and to foster two-way interaction between students and faculty. They provide functionality like whiteboards, chat rooms, drives, surveys, quizzes, discussion forums, polling, and reviews. That has enabled instructors and students to collaborate online so they could achieve teaching and learning objectives.

Pharmacy institutions in India are using Google-meet as a learning management system, and video conferencing applications like Zoom, Skype, etc. With the intensified impact of digital mode during COVID-19, it is important to evaluate the efficacy of online pharmacy education.

As a result, present research investigates students' approach and understanding of the advantages, limitations, and recommendations for online PC learning in India. The outcome will aid in determining the improvements which can be made first to make it more practical and worthwhile for pharmacy students.

II. METHODS:

1. Rationale:

The authors emphasized that survey study conducted for OL for pharmacy students. During this analysis, the survey was structured to evaluate student's perceptions and experiences of online pharmacy education during a lockdown. The decision to examine student behaviors and their expectations can seem contextual. And it is important to study their experiences under these pandemic, which are shared by students around the tier 1 and tier 3 cities of Maharashtra, India. Therefore the investigator has divided survey participants into two groups based on the tier of the city for analysis purposes.

2. Study design:

This study design was conducted from February to April 2021. The findings for the study were based on learners' experiences during the period they were involved in OL offered by LTIP. During that time, lectures, seminars, laboratory lessons, and examinations were conducted by online methods and virtual platforms.

Here OL was a mixture of live online teaching sessions (no recorded lectures), online live conversations with learners, and power point presentation (PPT). There were several short online quizzes through Google-form for each subject. In addition to that, assignments were given to write to students. There was full technical support for faculty to online lectures, making quizzes and PPT and to available drives on the cloud for sharing notes during lockdown. The college administration maintained all strings attached between faculties, students, and administrative assistants and closely monitored educational activities. The experience was fully discussed among faculties and principal about students and academic affairs during study.

tudents were asked to fill an online Google-form questionnaire which includes 40 questions that facilitate the distribution and efficiency of data. Participants were sent a link to the google form. The aim of the survey and its advantages were included on first page of survey with consent statement. In addition, they informed very clearly that participants' identities will stay anonymous to the research team. This will maintain privacy of each participant and their response data will be confidential.

3. Sample and setting:

The study sample included 65 pharmacy students from 1st year batch. All participants are currently enrolled as of the academic year 2020-21. The Google form was sent to participants and they have given sufficient time to respond and were interviewed on Zoom video conferencing. During interview, students had shared their perceptions, understanding and their recommendations to improve OL activities. The collected data from online survey and interview sent to expert for statistical analysis.

4. Questionnaire design

The questionnaire based on perceptions, obstacles, adaptability, acceptance, circumstances and area of improvement toward OL and related tools. It was designed to check 3 major aspects: advantage, limitations and

improvement of OL in pharmacy as per students’ perspective. From 40 questions, 36 questions were MCQ and 4 were subjective. 17 were used to assess the advantage, 17 for limitation and 6 for recommendation aspects.

Likert scale-based questions were used for survey. The MCQs were mixture of positive, negative and question type sentences. Each answer was given a score like strongly agree/ like = 3, neutral = 2, disagree/ dislike = 1 score.

Some questions were of MCQ allowing more than one option selection format, where students were selected option/s they found most suitable.

5. Data analysis

A 3 point Leikert scale was used for constructing survey questions. All collected data was analyzed by statistics expert. Each question responses were analyzed for n=65. Further, Mann Whitney U test was applied to determine if there is a difference between attitude and perceptions of two groups students living in tier-1 and tier-3 cities, each n=23, towards OL of PC.

III. RESULTS:

1. Participants’ characteristics:

Out of 67 students 65 completed online survey (97.01% response rate). Out of 65, 44.62 % were male (n=29) and 55.38% were female (n=36).

Only 6% (n=4) candidates has prior experience of OL before pandemic lockdown. 39 (60%) are attended OL from tier 1 city and 23 (35.4 %) joined from tier 3. Author noticed only 3 participants (4.6%) were from Tier 2 cities. Analyst has applied Mann Whitney U test to find a difference between study criteria of students from tier-1 and tier-3 cities.

Table 1: Participants’ characteristics			
		N	%
Gender	Male	29	44.62
	Female	36	55.38
Prior exposure for online study		4	6.2
City	Tier 1	39	60
	Tier 2	3	4.6
	Tier 3	23	35.4
Total Participants	n	65	100

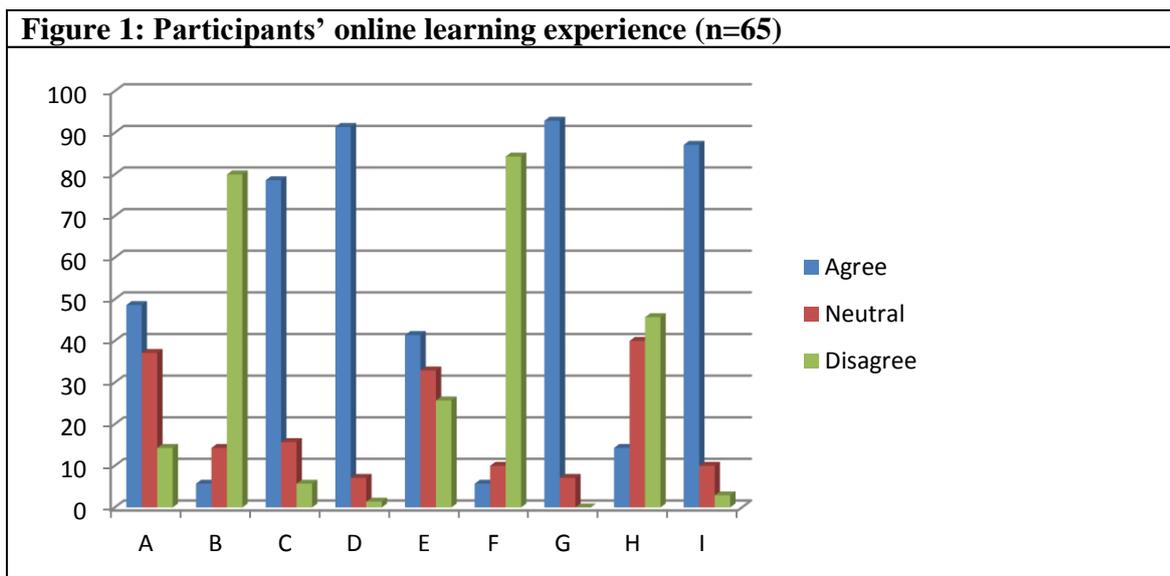
2. Analysis of survey questions:

Overall 44.3% participants dislike and only 17.1% show likeness in OL. Now days smart phones are available to everyone thus 91.4% attended classes with mobile. Author has noticed that although 92.9% has easy access to devices for OL, But 4.3% has facing issue of availability of devices and 2.9% sometime found trouble to get access of device.

71.4% have spent 4 to 6 hours of OL. Its means many of them were bunking online class. Evidence to it, in another question response 80% disagreed with the statement that is “OL is better than classroom / laboratory learning”. 74% use other mobile applications like whatsapp during OL.

The overall experience of students’ OL is represented in table 2 and graphically represented in figure 1. About 91.4% of believe that OL allows them to manage time more efficiently for assignment submission and 78.6% say that it saves time as they do not have to go college. 87.1% say that giving online quizzes on google form is interesting and engaging. However, 80% disagree to statement that OL is better than classroom / laboratory learning and 92.9% feel they are missing actually experimenting in laboratory. Only 41.4% agreed to statement that OL improves their confidence level in topic discussion. 45% disagree to statement that giving exam online is fair enough and 84.3% of disagree to statement that online laboratory practices is good.

		%		
		Agree	Neutral	Disagree
A	Online learning is a useful learning	48.6	37.1	14.3
B	Online learning is better than classroom / laboratory learning	5.7	14.3	80
C	Online learning is time saving as I do not have to go to my college	78.6	15.7	5.7
D	Online learning allows me to manage my time more efficiently in assignment completion	91.4	7.1	1.4
E	Online learning improves my confidence level in topic discussion	41.4	32.9	25.7
F	Do you feel online laboratory practices is good	5.7	10	84.3
G	Do you feel you are missing actually experimenting in laboratory	92.9	7.1	0
H	Do you like giving exam online is fair enough?	14.3	40	45.7
I	Do you like giving online quizzes on google form is interesting and engaging	87.1	10	2.9



The survey about students learning preferences (Table 3) show that 91.4% of are using small screen device like, smartphone for OL. 81.4% believe zoom to be more convenient. 64.3% believe that face to face interaction is needed. 98.6% agree that interactive lectures are best way to learn in comparison to pre-recorded lectures. The individual vote counts for sources of OL was 97.1%, internet search was 66%, peers was 64.3% and books was 30%. The individual vote counts for most useful and fascinating aspects of OL was 52.9% for PPTs, 20% for flow charts, 14.3% for images and pictures, 8.6% for videos, 4.3% for text content. 88.6% believe that reading the hard copy of the book is best reading practice while 11.4% believe e-books. 51.4% are unhappy with OL technology and application. However, 100% agree that OL is needed during the pandemic for safety purpose.

Table 3: Students learning Preferences	Preferences	% (N=65)
Devices used for online learning		
	Laptop	8.6
	Desktop	0
	Tablet	0
	Smartphone	91.4
Face to face ineraction needed for online lectures		
	Very much	64.3
	Neutral	27.1
	Not at all	8.6
Source of information for study		
	Lectures	97.1
	Internet	66
	friends	64.3
	Books	30
Most useful and fascinating aspect of online education		
	Content	4.3
	Images / Pictures	14.3
	Videos	8.6
	Flowcharts	20
	PPTs	52.9
Best way to learn from		
	Already recorded lectures	1.4
	Interactive online lectures	98.6
Application more convenient		
	Zoom	81.4
	Google meet	15.7
	Microsoft teams	2.9
	Edmodo	0
	Mooddle	0
Best reading practices		
	Reading hard copy of the book	88.6
	Reading e books online	11.4
Happy with online learning technology and application		
	Yes	18.6
	Neutral	30
	No	51.4
Online learnig is needed during pandemic for safety purpose		
	Yes	100
	No	0

Figure 2: Reasons of interest in online learning

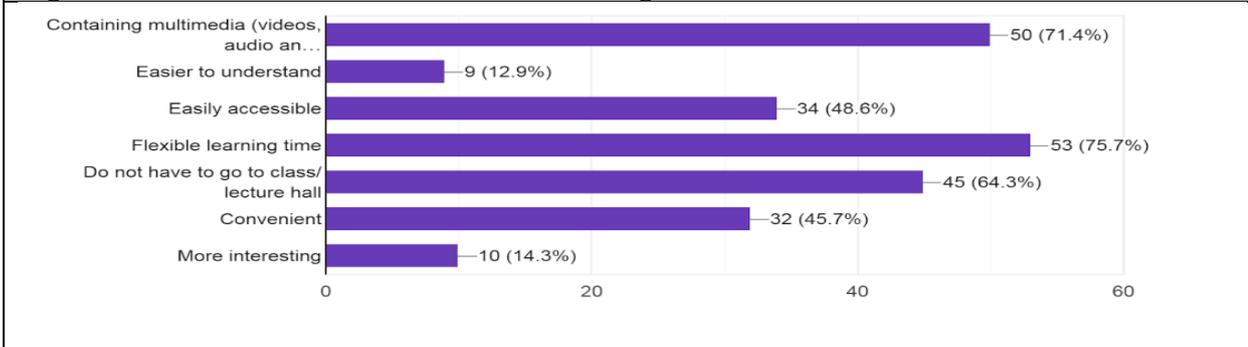


Figure 2 shows, most voted for reason of interest in OL is flexible learning time and inclusion of multimedia like videos and audio. It followed by the absence of need for travelling to college and ease of access and convenience. The least voted for categories are thinking OL is more interesting and ease of understanding.

Figure 3: Missing aspects in online pharmacy curriculum learning.

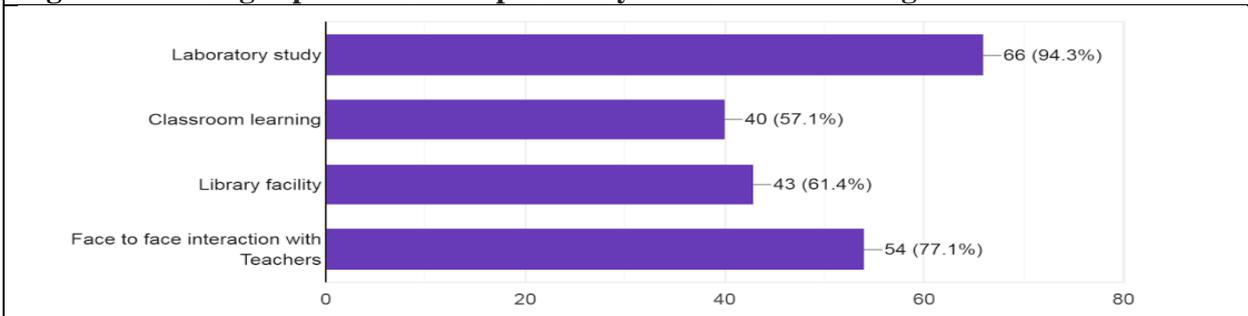


Figure 3 shows, Most voted categories for missing aspects in OL are hands-on laboratory study and face to face interaction, followed by library facility and classroom learning.

Figure 4: Reasons of disinterest in online learning.

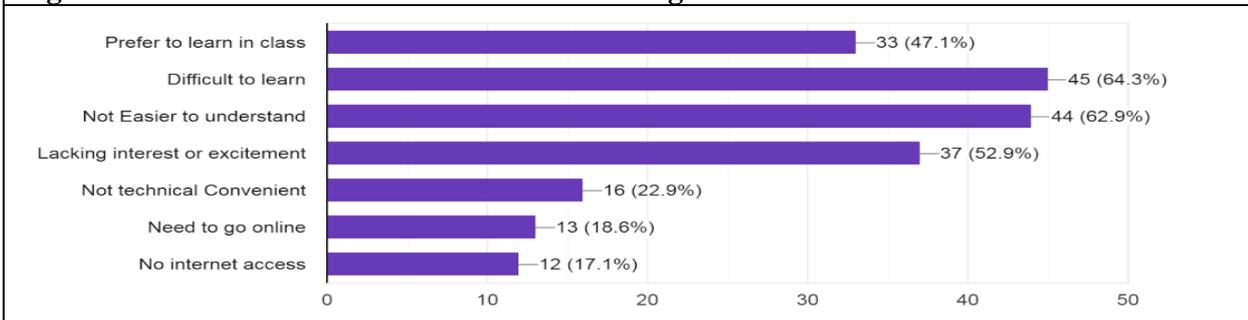


Figure 4 shows, Most voted for reasons of disinterest in OL is that it is difficult to learn and understand, followed by lack of interest, excitement and preference for classroom learning, followed by it being technically inconvenient. Least voted for categories were the need to go online and absence of internet access.

Figure 5: Issues faced by students during online learning.

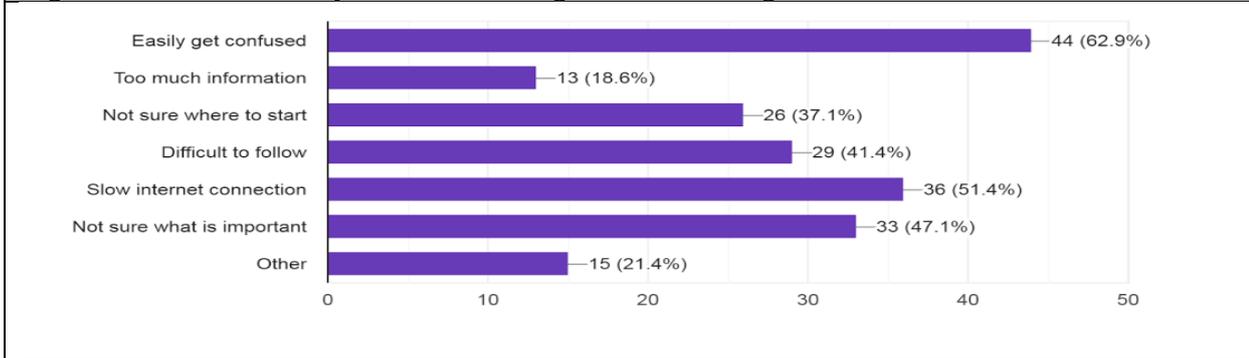


Figure 5 shows, Most voted categories for issues faced by students during OL is easily getting confused and slow internet connection, followed by inability to decide what is important and difficulty to follow, followed by not being sure about where to start. Too much information was the least voted for category, while 21.4% students provided their own inputs in others category text box.

Table 4: Students perceptions towards college, and faculty	Perceptions	% (N=65)
Supportiveness of college	Supportive	84.3
	Neutral	14.3
	Not supportive	1.4
Supportive Faculty	Yes	80
	Neutral	20
	Not at all	0
One on one conversation with faculty	Very much	12.9
	Neutral	55.7
	Not at all	31.4
Online Assignments and homework	Very much	74.3
	Neutral	25.7
	Not at all	0

Table 4

shows, Students perception about college and faculty shows that 84.3% think their college and 80% believe their faculty are supportive. 74.3% students are positive towards online assignments and homework. 55.7% are neutral about their one on one conversation with faculty while 31.4% say not at all.

Table 5 shows, For students perception towards OL, 92.9% agreed to having easy access to devices for OL. 62.9% think they can averagely manage time while 32.9% believe they can comfortably manage time. 71.4% spend 4 to 6 hours online and 74.3% use other applications like whatsapp while accessing their OL platform. 72.9% agree that they experience interruptions from home while studying online. 52.9% feel neutral about online communication with peers, while 24.3% say very much. 48.6% were neutral about stressfulness of OL and 40% said very much. 11.4% said not actually. Overall feeling about OL, 44.3% dislike it, 38.6% are neutral and 17.1% like it.

Table 5: Students perceptions towards online learning platform	Perceptions	% (N=65)
Overall feeling about online pharmacy education		
	Like	17.1
	Neutral	38.6
	Dislike	44.3
Easy Access to devices for online education		
	Yes	92.9
	No	4.3
	Sometime Yes	2.9
Time spent on internet		
	1 to2 hours	2.9
	2 to 4 hours	25.7
	4 to 6 hours	71.4
Use of other application during lectures (like whatsapp)		
	Yes	74.3
	Sometimes	11.4
	Never	14.3
Stressfulness of online learning during COVID-19		
	Very much	40
	Average	48.6
	Not actually	11.4
Time management while learning		
	Comfortably	32.9
	Average	62.9
	Difficult	4.3
Interruptions from home while studying online		
	Yes	72.9
	Neutral	20
	No	7.1
Online communication with peers		
	Very much	24.3
	Neutral	52.9
	Not at all	22.9

3. Statistical Analysis:

The data obtained from the survey questions is ordinal data, hence Mann-Whitney U test was applied. Statistics expert used Mann-Whitney U test to determine if there is a difference between the attitude of students living in tier 1 and tier 3 cities towards OL. The resultant Z score (-0.264) at $n_1=n_2=23$ was not greater than the p value (0.795), at alpha 0.05, we failed to reject the null hypothesis stating that the values were the same. It means that there is no significant difference between attitudes of students living in tier 1 and tier 3 cities towards OL of PC.

IV. DISCUSSION:

This study interprets perspective of pharmacy students of LTIP regarding OL. These results indicate that students continue to prioritize conventional classroom and laboratory approaches over OL. During lockdown due to COVID-19, OL was found to be beneficial for students' safety.

Although students show positive and accepting attitude towards some OL techniques like quizzes, google forms and believe that it saves their travel time and better time management for assignments, overall they feel that online examinations are unfair and they are missing hands-on experiences in laboratory.

OL through smartphones on zoom app is most used for learning among the students. Interactive or real time lectures are preferred by students. Lectures is the most voted for source of information for OL followed by internet searched and peers. While books was least voted for source of information. The preferred representation of the learning content/ notes was mostly PPTs, followed by flow charts, images, videos and books were least voted. Even though 88.6% believe hard copy of books to be best mode for reading study materials, it was the

least voted for category, pointing to the fact that they cannot physically access the library facility, or hard copies of notes.

Although majority of students believe that their college and faculty is supportive, the numbers show that one on one conversation with faculty is less. Students have ease of access to devices needed for OL, a majority of them used other apps like whatsapp while learning online and a majority of them experience interruptions from their home while studying online.

1. Advantages:

According to this study and interviews, the most significant benefit of OL in Pharmacy is that students are able to continue their studies during the lockdown. Students also discovered that time is easily manageable and they could easily access professors and subject notes when participating in OL. Participant feels that they can easily and comfortably attend lectures and learn through online. In addition, it is easy for them to submit assignments on time as their time is saved through OL. Most of students feel that as they don't need to visit college, thus they save travelling time and other expenses too. Submitting attendance through google form is helpful for those who have network issue during online lectures. The students have started to believe that OL has become helpful for them in improving their confidence in topic discussion. Most of the students prefer to give online quizzes through google form as they find it interesting, engaging and helpful for quick study.

2. Limitations

All participants emphasized on the point that they are unable to learn and practice laboratory lessons through OL. It is the biggest drawback for pharmacy students. They could only get information component of the learning. Few students reported difficulty in maintaining attention span during intensive lectures. A few Students tried to access online resources during examination which is unfair for other sincere students.

3. Recommendations:

Participants recommended that faculty should include more images and videos in lectures. Online classes should be more interactive and discussion based. In addition, they recommend sharing videos for practical lessons which has been recorded in the laboratory and performed by teachers.

V. CONCLUSION:

According to this reports' preliminary findings, pharmacy students at LTIP, favored blended learning over a single learning approach, either online or classroom alone during the lockdown. The author emphasized on 100% of students believed that OL is needed during the COVID-19 pandemic for students and faculties' safety purposes. But participants also felt that laboratory sessions should be with a practical approach only, which is not possible virtually. This could be solved by sharing recorded videos of the laboratory sessions.

This research might also help make decisions about what topics from the curriculum should be online or blended, or offline. These findings might also useful in setting new rules, policies, and decisions to use technologies to enhance online PC learning. According to this report's preliminary findings, pharmacy students at LTIP, Kharghar favored blended learning over a single learning approach, either online or classroom alone during the lockdown. The author emphasized on 100% of students believed that online learning is needed during the COVID-19 pandemic for students and faculty's safety purposes. But participants also felt that laboratory sessions should be with a practical approach only, which is not possible virtually.

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