

PERCEPTION OF SECOND-YEAR MBBS STUDENTS ABOUT ONLINE LEARNING IN PATHOLOGY PRACTICALS AT MEDICAL INSTITUTE

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Received : 28/07/2023
Received in revised form : 26/08/2023
Accepted : 08/09/2023

Keywords:

COVID-19, E-learning, Undergraduates, Pathology practicals.

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DOI: 10.47009/jamp.2023.5.5.99

Source of Support: Nil,

Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (5); 506-511



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Abstract

Background: The World Health Organization (WHO) declared COVID-19 as a pandemic on 11 March 2020. The causative virus SARS CoV-2 brought Earth to a standstill. The outcome of the disease was potentially fatal which interrupted medical teaching. This made it difficult to find an alternative way of teaching. Medical colleges had to change from in-person (offline) lectures and practical to E-learning sessions to maintain consistency in the education system.

Materials and Methods: A retrospective observational study was done in two different time periods (From May 2020 - January 2021 and March 2021 - May 2021). This study was done at Dr. Vasant Rao Pawar Medical College, Hospital & Research Nashik. A standardized feedback form was filled out based on the five-point Likert scale. **Result:** We received responses from 208 students about online learning in pathology practicals. During the crisis, E-learning was a convenient mode of learning that included Power-Point presentations, the use of photographs of specimens and videos in practical sessions) according to 202 (97.11%) students. **Conclusion:** The younger generation, whether from the city or rural areas is habitual of using smartphones. E-learning was a convenient mode of learning during the COVID-19 pandemic. Overall feedback was positive for online education.

INTRODUCTION

Till 31st March 2020, more than 11 countries were influenced by the SARS-CoV-2 virus.^[1] This led to the announcement of lockdown in many countries and closure of schools, universities and medical colleges.^[1,2] Clinical rotations of undergraduates to medical wards were cancelled. 1st and 2nd year medical undergraduates were prevented from attending offline classes and practical sessions.^[3] This was also due to fear of students getting infected during clinical postings or can be carriers of viruses subsequently infecting other non COVID patients, classmates and faculty members and other staff.^[3] Undergraduates had to leave colleges and hostels and return to their homes.^[2] They were not considered as crucial workers in medical system compared to resident doctors.^[4] According to Indian Medical Association (IMA), succeeding generation of medical professionals may have deficient practical expertise. This will cause loss to medical education and to community.^[2] Sufficient resources were

available in advanced nations to manage the expanding requirements of health care and medical education, developing countries had problems managing the situation.^[2] Lockdown in the COVID-19 pandemic emphasized on scopes for undergraduates and teachers to figure out the condition. Virtual education was implemented in many medical institutions.^[3] Many online methods adopted were: Zoom, google meet, team viewer, WEBEX and Skype.^[2] To design virtual teaching program, management of time, designing, team work and adapting newer advances and infrastructure for distance learning was needed.^[4] Effective steps should be taken to deal with such disasters as COVID-19 may not be the last globally communicable disease causing danger to students, teachers, and society.^[5]

Senior medical faculties from all over the country took efforts for the utmost use of online teaching with the help of advanced technology. This helped in maximum reduction of impairment of education in this interrupted clinical experience.^[2] A report by India Today on March, 2021 showed dedication of

doctors towards their duty for mankind and persistent effort to adapt strategies in medical education that serves to fulfill the demand of ongoing health crisis. Online learning was not a mainstay or part of the syllabus designed by the Medical Council of India (MCI). Hence most of the time there was anxiety and hesitance in implementing new technology and so for E-learning. When people experience the advantage of newer techniques, they adapt it easily.^[6] E-learning has shown many benefits in content distribution and clinical experience. Though many medical undergraduates were from rural areas and faculties were situated in cities, E-learning education could reach anywhere and anytime with the use of smart phones. Hence it was very easy to convey any change in time table.^[7] Online learning is beneficial in many ways such as better understanding of subjects and improving competency.^[6] There is ease in communication with health care professional from several nations.^[2] The main attention of M.B.B.S (Bachelor of Medicine and Bachelor of Surgery) undergraduate is towards lectures and practical sessions. Lecture based classrooms are routine and habitual ways of educating medical undergraduates, giving more emphasis on theoretical knowledge in conventional mode of teaching.^[6] Pathology is the diagnostic subject in medical field. The important part of pathology is learning through examination of microscopic slides which for many undergraduates is a tedious task. Maximum number of undergraduates from 2nd year M.B.B.S faced difficulty in microscopic pathology slides in pathology assessment.^[7]

In exams, there are some difficulties for students to recollect microscopic pathologic observations. So, importance was given to this part of the pathology curriculum in practical sessions, which helped students. With regular revisions of microscopic slides by using online tools, students faced assessments with much comfort.^[3]

Prior to establishing an effective remote learning facility, it is essential to know about undergraduate's view towards it.^[6]

Objectives of the Study

1. To evaluate the effect of online learning which includes Zoom meetings and Google classrooms for pathology practical sessions.
2. Assessment of the comfort zone of online learning among medical students for pathology practical sessions.

MATERIALS AND METHODS

Ethics committee permission was taken before initiation of the study. All the students satisfying eligibility criteria was included. This retrospective study was done at Dr. Vasantao Pawar Medical College, Hospital & Research Nashik. among two batches (120 students per batch). M.B.B.S students from May 2020 to Jan 2021 (admission batch2018)

and from March 2021 to May 2021 (admission batch 2019).

Inclusion Criteria

1. Medical college students of Dr. Vasantao Pawar Medical College, Hospital & Research Nashik of two batches.
2. M.B.B.S students from May 2020 to Jan 2021 (admission batch 2018) and from March 2021 to May 2021 (admission batch 2019).

For practical sessions, photographs of specimens, instruments and charts were taken. These included:

1. Gross specimens available in Pathology department museum for general pathology and systemic pathology (anterior, posterior and lateral views of specimens, external and cut section appearance).
2. Microscopic examination of slides on 4X (scanner view), 10X (low power view), 40 X (high power view) and for haematology on 100 X (oil immersion) with the help of C-MOS camera VUE CMOS 5MP attached to Nikon Penta head microscope.
3. Instruments of tissue processing such as paraffin blocks, Leukarts moulds (L mould), tissue cassettes, microtomes, tissue floatation water bath, different types of needles required for liver biopsy and bone marrow aspiration and biopsy.
4. Clinical pathology: (a) Use of urinometers for estimation of urine gravity. (b) Variety of chemical used for urine examination (c) Types of vacutainers, needles and syringes of different sizes (d) Sahli's hemoglobinometer
5. Blood bank- double or triple blood collection bags with anticoagulants, different antisera required for blood grouping cross match.

Videos were shot such as gross examination of specimens, microscopy slides description, physical and chemical tests done in urine examination, haemoglobin estimation by Sahli's hemoglobinometer and blood group examination. Photos and videos were inserted in practical and in some lecture power point presentations related to respective topic. Revision practical sessions were conducted and videos were uploaded on google classroom. Timetable was scheduled to give equal importance to practical session as well as to lecture. During practical sessions of systemic pathology and general pathology, power point presentation slides containing pictures of gross specimen, microscopic slides in the relevant topic were shown. Based on topics covered in theory and practical sessions, assessments in the form of spots examination as conducted in internal exam and university exam were given on google classroom. Also regular weekly questionnaires like multiple choice questions, short and long answer questions were designed and given to students. Students were asked to take photographs of their answer sheets and upload on google classrooms. These questions and answers were discussed with students group wise. Positive

feedback was given for correct answers and difficulties were discussed.

Feedback was taken based on the five-point Likert scale consisting of:

- Strongly Agree.
- Agree
- Undecided
- Disagree
- Strongly Disagree

Table 1: Feedback form

S.no.	Category	Response
I.	Strongly Agree	
II.	Agree	
III.	Undecided	
IV.	Disagree	
V.	Strongly Disagree	

RESULTS

Of the 240 students, we were able to enroll only 208 students as the other 32 students did not agree to fill out the form. We found that 202 (97%) students out of 208 students gave positive feedback about the online mode of learning during a pandemic. 129 (62%) students out of 208 strongly agreed, 73 (35%) students agreed that E-learning as a convenient mode of learning, and 6 (3%) students could not decide about this. [Figure 1]

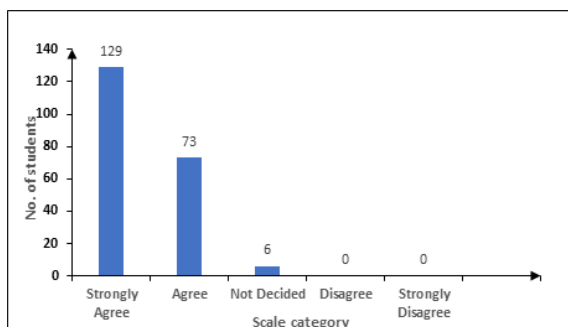


Figure 1: E-learning as a convenient mode of learning (Power-point module and Video lectures)

The concept of clearly understanding the topic in online mode is shown in Figure 2 which depicts those 112 students (54%) strongly agreed, 87 (42%) agreed, 5 (2%) were not able to decide and 4 (1.9%) disagreed.

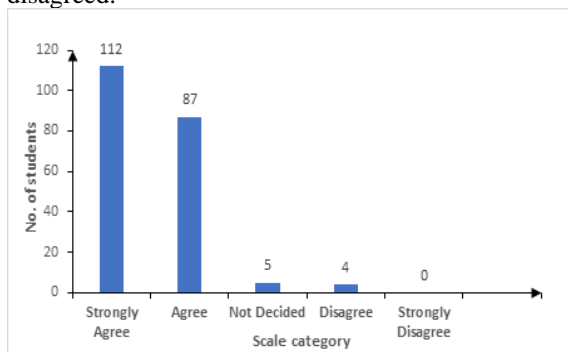


Figure 2: Clear understanding of the online concepts of practicals and other classes of pathology

Total 164(79%) students faced technical problem during online lecture and practical sessions. 13 (6%) strongly agreed, 28(14%) agreed, 79 (3%) disagreed and 88 (42%) strongly disagreed to such malfunction. [Figure 3]

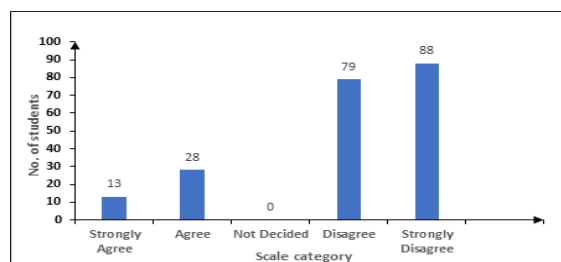


Figure 3: Technical glitch encountered during the session was a problem for some students.

A total of 164 students (79%) faced technical problems during online lectures and practical sessions, while the rest students didn't face any technical issues. For the clear visibility of the specimens, slides, and instruments 117(56%) students strongly agreed, 86 (41%) students agreed and 5(3%) students were not able to decide. [Figure 4]

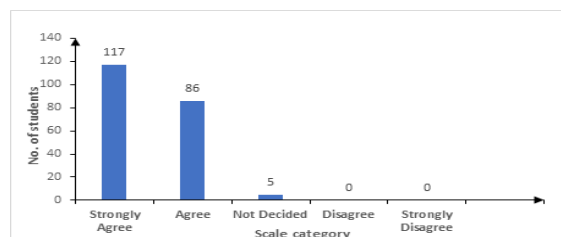


Figure 4: Picture visibility of specimens, slides, and instruments was clear to understand

During practical sessions for pathology subjects, gross examination of pathology specimens, microscopy slides, instruments of histopathology, cytopathology, clinical hematology, and blood bank and charts of clinical cases are essential. Hence picture visibility of the specimens, slides, instruments, and charts was an important aspect of the online practical. 203 (97%) students accepted that picture visibility was clear to understand as photographs were clicked from different angles. For the clear and audible audio during virtual classes 136 (65%) students strongly agreed 61(29%) students agreed, 5(2%) were not able to decide and 6(3%) disagreed. [Figure 5]

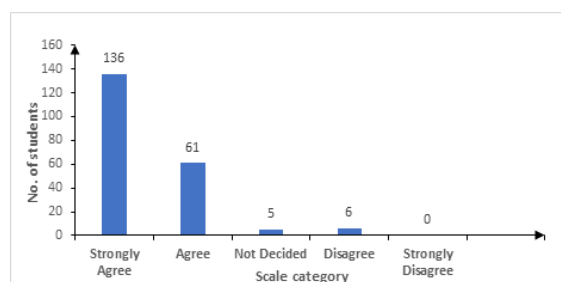


Figure 5: Properly audible videos

[Figure 6] shows that almost all students gave positive feedback for topics summarized by teachers at the end of the session. 98 (47%) students strongly agreed and 110 (53%) agreed.

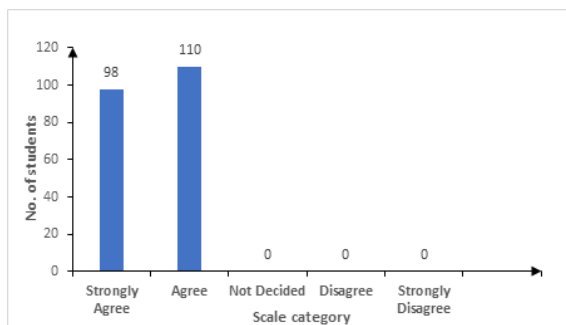


Figure 6: Summarization of the topic at the end of the session

[Figure 7] that shows students were encouraged to ask queries and doubts were clarified during online sessions. 126(61%) students strongly agreed, 69 (33%) students agreed, 9(4%) students were not able to decide and 4 (2%) students disagreed with this. Teachers faced problems in addressing all students' doubts in one hour of theory sessions and two hours of practical sessions.

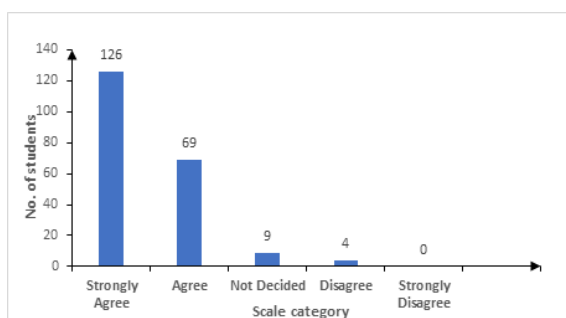


Figure 7: Encouraged to ask queries and doubts were clarified

[Figure 8] shows that 78 (38%) students strongly agreed, 107(51%) agreed to this, 14(7%) students were unable to decide and 9(4%) were not able to remember the topic at the end of the sessions.

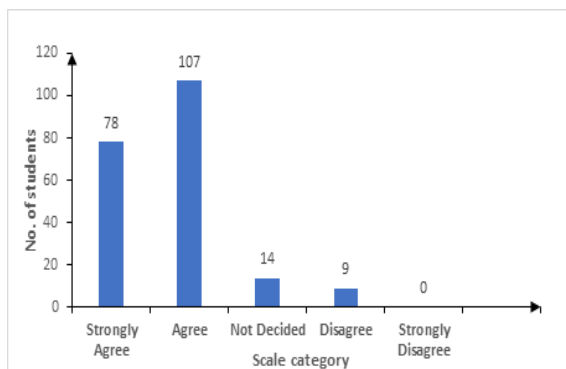


Figure 8: Students remember the topic at the end of the session

[Figure 9] shows almost all students were helped by intermittent assessments. 138 (66%) students strongly agreed and 70 (34%) students agreed to development of confidence for university exams.

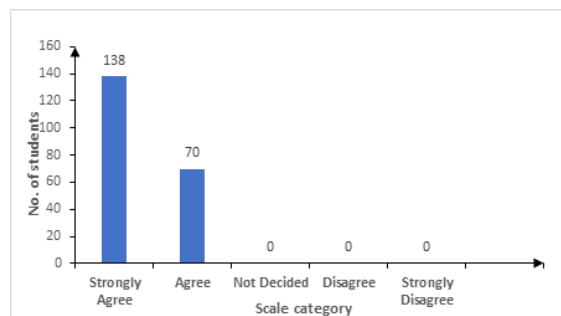


Figure 9: Intermittent assessments for preparation of university exams

[Figure 10] shows that students preferred to continue online learning till offline learning resumes. Response as strongly agreed 142 (68%) and agreed by 66(32%).

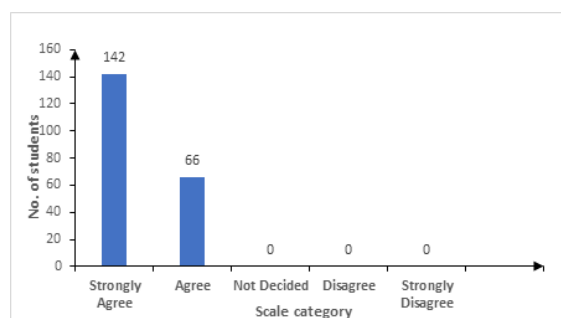


Figure 10: Preference for online learning to continue till offline learning resumes

[Figure 11] depicts that almost each and every student showed interest in reviewing specimens, microscopic slides, and instruments after resuming offline sessions. 131students (63%) out of 208 strongly agreed and 77 students (37 %) agreed for the same.

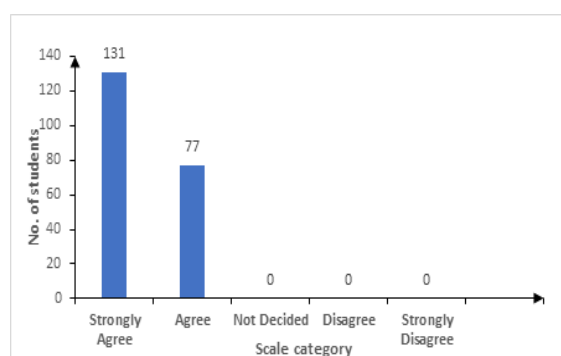


Figure 11: Preference to see specimens, slides, and instruments after resuming offline sessions

All the analyzed data was tabulated in a table 2 as shown below.

Table 2: Different parameters summarized in the given table

Q. No	E learning during COVID-19 pandemic	Strongly Agree (I)	Agree (II)	Undecided (III)	Disagree (IV)	Strongly Disagree (V)
1	E-learning was a convenient mode of learning (Power point module and Video lectures)	129 (62%)	73 (35%)	6 (3%)	0	0
2	Concepts understood clearly	112 (54%)	87(42%)	5(2.1%)	4(1.9%)	0
3	Encountered intermittent technical glitch in between the session	13(6%)	28(14%)	0	79 (38%)	88(42%)
4	Picture visibility of specimens, slides, instruments was clear to understand	117 (56%)	86(41%)	5(3%)	0	0
5	Properly audible video	136 (65%)	61 (29%)	5 (3%)	6 (3 %)	0
6	The teacher summarized the topic at the end of the session	98 (47%)	110 (53%)	0	0	0
7	Encouraged to ask queries and doubts were clarified	126 (61%)	69 (33%)	9(4%)	4(2%)	0
8	Able to remember the topic at the end of the session	78 (38%)	107 (51%)	14 (7%)	9 (4%)	0
10	Intermittent assessments helped in building confidence for university exams	138 (66%)	70 (34%)	0	0	0
11	Preference to online learning to continue till offline learning resumes.	142 (68%)	66 (32%)	0	0	0
12	I would like to see the specimens, slides and instruments after resuming of offline sessions	131 (63%)	77(37%)	0	0	0

DISCUSSION

Integrity and continuity of medical education became one of the vital tasks during COVID -19 pandemic.^[8] “Change is the only constant.” Medical education necessitates to transform abrupt modifications in health system.^[9] As per studies done by Emmanuelle Motte- Signoret et al, Safdieh JE et al and Tabatabai S et al COVID-19 pandemic made the necessity of technological modification in the medical education.^[10-12] New models of educational innovations helped to resolve the issue of disrupted education in much greater extent and has given chance for undergraduates to complete academic year by distance learning. Benzoin Samueli et al, McCullough LB et al concluded in their study that COVID- 19 emergency has given the world the prospective to upgrade E-learning.^[1,5] In scenario of COVID-19, use of technology aided the students and teachers to adapt to E-learning and thus to continue medical education.^[8] In our institution, infrastructure was improved for online learning platforms such as Zoom and Google Meet etc. and training was given to faculties to use these modalities. Almost all students whether city or rural area had smart phones with internet facility. Ahmed Alsoufi et al in his study observed that maximum number of medical undergraduates had facility of electronic gazettes and could utilize them very well.^[8] Nanda B et al also observed that undergraduates experienced benefits of online learning such as less consumption of time and improving learning capacity and it can be blended with offline teaching. Newer advances are acceptable by students if these advances improve their skills and assessment outcomes.^[6] Study done by Sharma C et al., and Alsaywid B et al observed that students were overall gratified with virtual education.^[7,13] As per study done by Bajaj U et al, majority of students choose virtual learning rather than using notes.^[14] In

our study student’s overall feedback was positive about online mode of learning during pandemic and concepts taught were clearly understood with online mode as per 95.67% students.

Online teaching was effective to apply, though some technical glitches were faced. As per our study, 167 (80.29%) could attend sessions without much interruption while few students faced technical disruption. Sometimes common barrier was non-availability of good internet service from institution as well as from student’s part. Ahmed Alsoufi et al in his study noted that fair number of students faced economic and technical glitches.^[8] In study done by Nanda B et al, 94.27% of the students demanded for implementation of virtual learning in traditional learning methods.^[6] Feedback observed in our study was similar to study done by Sharma C et al. In her study, comfort of using e-learning was 88% which was comparable with our study (97.11%).^[7] Concepts understood by our undergraduates are 95.67% (strongly agree 53.85%, agree 41.82%). This was similar to her study with 74% positive feedback. Topic remembered at the end of the sessions using E-learning was 88.94% in our study and 76% in study done by Sharma C et al. This was feasible due to all measures taken to prepare content for online sessions both for theory and practical classes, properly audible videos, clear picture visibility (of specimens, slides, instruments), topic summary at the end of the sessions and clarification of doubts. But 11.06% students were not able to understand the topic at the end of the sessions. This could be due to intermittent technical issues. Recorded power point presentations of each theory and practical sessions were shared on Google classroom. Students could go through them after the classes which aided them to comprehend the topic. Almost all students gave positive feedback for topic summarized by teachers at the end of the session. Topic summary makes learning fast and easier. Students were encouraged to ask queries and

doubts were clarified during online sessions. Most of the students gave positive response but few students disagreed to this. Teachers faced problems to address all students' difficulties in one hour of theory sessions and two hours of practical sessions. Students were helped by intermittent assessments as these helped to build confidence for university exams. In addition, students opined that intermittent assessments helped them to revise the covered syllabus. As per a study done by Bajaj U et al, 58% of students could gear themselves up for assessments with material supplied during virtual classes.^[14] Almost every student showed interest in reviewing specimens, microscopic slides, and instruments after resuming offline sessions. D.P SKLAR et al stated that we learned from adversity to refine and apply technology in the distribution of medical content.^[15]

CONCLUSION

In the midst of this COVID-19 crisis, it was essential to continue medical education without harm to society and individuals. Adaptation to a pandemic in the education field was achieved by implementing distance learning in a healthy environment. The pandemic not only created the need but also provided the chance to accelerate digital transformation in medical education. This form of learning experience showcased the commitment of health centers towards humanity to the general public and made it essential that we continue to make real-time changes in the medical curriculum that cater to the needs of emerging and current healthcare problems.

The younger generation, whether from the city or rural areas is habitual of using smart phones. Quite a fair number of students also have laptops and tabs. A good internet facility is available in many parts of our country. E-learning was a convenient mode of learning during the COVID-19 pandemic except few events of technical glitches. Teachers were able to complete the syllabus on time. Students were also able to understand the topic and were able to face practical exams with confidence. Overall Feedback was positive for online education.

Limitations of the study

Few missing feedbacks which were not collected and communicated properly and all the ongoing batches in the medical college at that time were not included due to the lack of time. Reasons for such feedback which were not responded should be found out, by

communication with undergraduates and appropriate solutions should be sought.

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