An Online Dermatology Teaching Module for Undergraduate Medical Students amidst the COVID-19 Pandemic: An Experience and Suggestions for the Future

Abstract

Introduction: The COVID-19 pandemic has disrupted clinical teaching in medical schools. Direct patient interaction, especially in groups, in out-patient departments or wards, was also made difficult. Institutes have adapted to the changed circumstances by increasing the use of online learning. We share our experience with a module of online Dermatology for undergraduate students. **Methods:** An online module, aligned with the existing course objectives was designed and applied for two cohorts (year 4 and year 5). The module included student manuals, Powerpoint-presentations, videos, and quizzes uploaded on dedicated online management systems. There were live interactive sessions in small groups also. The small group session included student-led case presentations and faculty-led simulated case discussions. Feedback was taken from both the students and the faculty regarding the module using a structured questionnaire. **Results:** A total of 45 students and 4 faculty responded to the respective questionnaires. A majority of the students felt that the module covered the planned content adequately. The faculty and the majority of the students were also satisfied with the technical aspects of the module. Student and faculty concerns were mainly in the area of assessment and practical skills. While faculty were concerned about the validity of the assessment, students were concerned mainly about difficulty and the need for more orientation regarding the assessment. **Conclusions:** The students and faculty were satisfied with the online Dermatology module in our study. However, the validity of assessment and the training of practical skills are major limitations.

Keywords: *Dermatology, distance education, online learning*

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Introduction and Background

The COVID-19 pandemic has had a significant impact on all aspects of normal life. Teaching and learning, at all levels have also been affected, including clinical teaching in medical schools. Direct patient interaction, especially in groups, in out-patient departments or wards, is difficult. To add to this, patients have also reduced visits for nonemergency reasons. Institutes have adapted to the changed circumstances by increasing the use of online learning. Online education has its own limitations, especially in medical education, more so in the context of clinical rotations. Dermatology, being an inherently visual specialty, probably is more amenable to online learning as compared to other specialties.[1-3] We describe our experience and the student and faculty feedback after an online Dermatology teaching module for undergraduate medical students, which was created in lieu of traditional teaching, due to the restrictions imposed by the pandemic.

Methods

Dermatology, for undergraduates, in our institute is covered in two years—the fourth and the fifth. In the final year (year 5), Dermatology is in the form of a clinical rotation of 2 weeks. The students attend the Dermatology clinics in small groups. Daily discussions and assessment follow the Mini Clinical Evaluation Exercise (Mini-CEX) format. Summative assessment is in the form of a written problem-solving examination and an Objective Structured Clinical Examination (OSCE) at the end of the rotation. In addition, the students have a Dermatology rotation in the previous year (year 4) of 2 weeks. Of this, 1 week is a simulation-based course, where simulated

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patients are used to discuss the most common and important conditions seen in our clinics. The second week is in the form of the clinical rotation as in year 5. Assessment in year 4 is similar to year 5, except for the written exam being mainly based on Multiple Choice Questions (MCQs).

The COVID pandemic forced us to cancel clinic attendance for the students and we created an online teaching module to cover the learning objectives as best as possible.

The module was basically based on the discussion of clinical scenarios, using simulated patient histories, images, and investigation findings. For history simulations, the tutor conducting the session, would himself or herself act as the patient and the students could ask relevant questions in the history. This would be followed by the student attempting to describe the skin lesions in the clinical image, after which relevant investigation findings would be discussed and then the student would give his treatment plan. Formative assessment grades were based on these daily case discussions and short weekly quizzes. The sessions were conducted in small groups of 5 to 8 students per group at a time. The primary platform used was Blackboard®, as this is the official learning management system already used for distance learning in our University. Additional platforms used included Zoom® and Microsoft® teams. Additional platforms were mainly considered in case of technical issues with Blackboard® during the live sessions. All assessments were done on Blackboard®. In addition, other applications/software (like WhatsApp®) were used for quick communication between the tutor and the students. Short presentations and videos created by the faculty were uploaded on the learning management system for student reference. Daily quizzes were also uploaded on Blackboard® for practice. Each large group had about 25 students at a time for year 5 and around 50 students for year 4. The groups were divided into smaller subgroups for student presentations and case discussions during daily sessions, so that each faculty had 5–8 students at a time. The average session duration was around 2 h. Each group had at least 4 short formative assessments, including one mid-rotation assessment (all in the form of higher order MCQs). The final summative assessment was also based on clinical scenario based MCQs, including questions with images.

Online surveys were conducted to obtain feedback from both the students and faculty. The questionnaires covered general experience and satisfaction levels with the online teaching module, perceived problems, and possible suggestions to improve the experience. For each specific parameter—technical aspects/software, content coverage, time, and assessment, both the faculty and students were asked to rate their experience from 1 to 5 (1 being poor, 5 excellent).

Results

A total of 45 valid responses from the students were included in the analysis. The details of the responses are summarized in Table 1. The students gave high mean scores for all components, including overall content coverage (history and treatment plans), time/duration of session, and the software/technical aspects. The students gave a relatively low mean score for the practical skill sessions and the assessment. Blackboard® was the most commonly used platform. In the open comments, a need for a more detailed orientation session, especially regarding the assessment was highlighted. The other main suggestion was related to the need for more time for the online quizzes.

Four faculty involved in the teaching shared their feedback [Table 2]. The scoring was similar to the students as far as technical aspects and overall content coverage was concerned. The faculty gave a lower score for practical skills training and assessment. Blackboard® received the highest scores as far as the platform is concerned. The open comments highlighted that the technical aspects were not a major concern as far as faculty were concerned. The faculty felt that the online sessions had the added advantage of flexibility in terms of timing and the recordings were available for the students for future references. The obvious limitations highlighted by the faculty included the inability to make the students perform skills (like the Auspitz sign or doing a fungal smear, for example). Assessment of nonverbal communication skills was also another issue which was highlighted. The validity of clinical assessment in general was concern raised by the faculty.

Discussion

Shifting to an online only model for teaching Dermatology was something new for both the students and the faculty, especially because, there was no time for detailed orientation or training for both the groups. However, in spite of these problems, the general response to the online module was encouraging and positive.

Previous studies have explored the use of online modules in Dermatology. The use of web-resources and social media

Table 1: Summary of student responses (*n*=45)

Score (1 poor to 5 excellent) →	1	2	3	4	5	Mean	Median
Practical skills	7	3	16	11	8	3.28	4
Technical issues/software	6	3	7	16	13	3.6	4
Time	5	1	11	10	18	3.77	4
Assessment	9	3	9	11	13	3.35	4
Overall content coverage	3	3	6	12	21	3.97	4

Table 2: Summary of faculty responses (*n*=4)

Score (1 poor to 5 excellent) →	1	2	3	4	5	Mean	Median
Practical skills	0	0	3	0	1	3.5	3
Technical issues/software	0	0	1	2	1	4	4
Time	0	0	3	1	0	3.25	3
Assessment	0	0	4	0	0	3	3
Overall content coverage	0	0	0	4	0	4	4

discussions have shown to be effective as an adjuvant in Dermatology and medical education in general.[1-6] However, with the COVID-19 pandemic, we were in a unique positions, being forced to use online teaching as the only tool for a group of our students. In our case, however, access to a preexisting Learning Management System helped to adapt relatively quickly to the changed situation. The Learning Management System (LMS), however, was previously used only as an adjunct to the normal clinical teaching, mainly for access to uploaded teaching material (powerpoints) and practice quizzes. It was not mandatory for the students to use the LMS prior to the COVID-19 pandemic. Moreover, clinical teaching has limits as far as online teaching is concerned. Both the students and the faculty highlighted the problems in practical skills training, with the faculty also highlighting the validity of assessment related to the same and this is an area which needs exploration and consensus building, especially if the pandemic lasts longer. Some of the general tips for online education apply equally well for clinical teaching—the use of multiple tools like lectures, demonstration videos, student presentations, interactive quizzes and the need to avoid of over-reliance on live classes, encouraging regular feedback from and to the students, and identifying students who need help early.[7] While being "adult learners," undergraduate students are understandably less independent, as compared to residents. Teachers need to keep this in mind and consider a bit more of "hand-holding" for undergraduate teaching. The use of independent learning modules, virtual grand rounds, YouTube® videos, webinars, and online journal clubs would be a great resource for residents,[3,8,9] but may not work that well for undergraduates. The use of social media, especially Twitter®, for patient-centered medical education, is another area which has been explored recently. Medical students can interact with real patients who share their experience on social media.[10] However, this too might be more difficult to apply practically at the level of undergraduate courses. Teaching and assessment of skills would seem to be the most important bottleneck as far as online teaching in Dermatology is concerned. The use of demonstration videos can help to some extent. Electronic OSCEs could cover some essential skills, like description of skin lesions. Students could be asked to attend simulation labs in smaller numbers, with adequate social distancing measures, for both training and assessment of practical skills.

As of now, there seems to be no clear end to the pandemic. Clinical teaching may have to consider the possibility of long-term adaptation to the changed situation.

Some possible suggestions/recommendations to maintain quality as much as possible are:
- Combine teledermatology with teaching. Students can join online consultations using platforms like Blackboard collaborate or Microsoft teams, where the actual consultation can be combined with teaching. Group size will have to be kept small. Group size is critical to ensure that all students are actively participating. Patient consent will have to be ensured. Formative assessment can be a combination of verbal feedback with the mini-CEX form, which can be shared and discussed after the session on a one-to-one basis with each student
- Assessment drives learning, and designing an effective assessment for online clinical modules is always a challenge. In the case of dermatology, this could be in the form of higher order MCQs or problem-solving questions with embedded clinical and histological images. Online case discussions and OSCEs can also be done using real or simulated patients combined with moulages or clinical images, but will need more logistical support. Learning management systems have integrated assessment systems which are specifically suited for Dermatology (like the Hot-spot in Blackboard®-which involves students marking specific areas of an image in response to questions. This can be used for lesion identification). Online assessment tools need to evaluate for validity and reliability
- Direct students to already established online digital learning modules (like cyberderm.net or Statpearls), which can be used during self-directed learning
- The power of social media can be harnessed as an adjunct. Instagram or twitter based discussions could add to the module
- Training and orientation of both students and faculty, and addressing their concerns and queries is key to an effective online module. A shared orientation session at the beginning might really help in improving outcomes.
- Administrative support is key to choose and maintain appropriate dedicated Learning Management Systems. Regular feedback from both the students and the faculty should be obtained and acted upon
- Get material peer-reviewed. The teaching materials— slides, videos, lectures, and quizzes, all need to be peer-reviewed by a colleague to ensure that they actually achieve the objectives they are mean to achieve. This also acts as check for errors
- Finally, we need to use this opportunity to build a community of dermatology educators, to exchange ideas, build consensus, and share material, which would help to improve and possibly standardize Dermatology teaching all over the world

Training students in practical skills and ensuring effective and valid assessment of the same are the most important challenges as far as online education in undergraduate Dermatology courses is concerned. General tips for distance/online learning apply to Dermatology and medical education too, but the inherent visual nature of Dermatology needs to be considered and can actually be an advantage when designing online courses in Dermatology.

The small sample size (for both faculty and students) was the major limitation in our study. We did not factor or

analyze aspects like proficiency in computers and previous experience with online modules, which might have affected the results. Detailed analysis of the assessment scores was also not incorporated into this study.

Conclusions

Our study demonstrated that well-designed online modules can be effective for undergraduate teaching. Online modules have their own advantages and disadvantages. While the modules can cover most of the planned theoretical content, they are limited by obvious issues related to validity- mainly in the context of practical skills and assessment. Larger studies to explore the possibility of effectively combining online modules with actual clinical rotations and assessments are warranted.

Declaration of participant consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the participants have given their consent for their images and other clinical information to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, limitations and recommendations for online learning during COVID-19 pandemic era. Pak J Med Sci 2020;36(COVID19-S4):S27-S31.
2. Kaliyadan F, Manoj J, Dharmaratnam AD, Sreekanth G. Self-learning digital modules in dermatology: A pilot study. J Eur Acad Dermatol Venereol 2010;24:655-60.
3. Schneider SL, Council ML. Distance learning in the era of COVID-19. Arch Dermatol Res 2020:1-2. doi: 10.1007/s00403-020-02088-9.
4. Singh DG, Boudville N, Corderoy R, Ralston S, Tait CP. Impact on the dermatology educational experience of medical students with the introduction of online teaching support modules to help address the reduction in clinical teaching. Australas J Dermatol 2011;52:264-9.
5. Scaperotti M, Gil N, Downs I, Jeyakumar A, Liu A, Chan J, *et al*. Development and evaluation of a web-based dermatology teaching tool for preclinical medical students. MedEdPORTAL 2017;13:10619.
6. Chou WY, Tien PT, Lin FY, Chiu PC. Application of visually based, computerised diagnostic decision support system in dermatological medical education: A pilot study. Postgrad Med J 2017;93:256-9.
7. Gewin V. Five tips for moving teaching online as COVID-19 takes hold. Nature 2020;580:295-6.
8. Abi-Rafeh J, Azzi AJ. Emerging role of online virtual teaching resources for medical student education in plastic surgery: COVID-19 pandemic and beyond. J Plast Reconstr Aesthet Surg 2020;73:1575-92.
9. Guzman AK, Wang RH, Nazarian RS, Barbieri JS. Evaluation of YouTube as an educational resource for treatment options of common dermatologic conditions. Int J Dermatol 2020;59:e65-7.
10. Giroux CM, Moreau KA. Leveraging social media for medical education: Learning from patients in online spaces. Med Teach 2020:1-6. doi: 10.1080/0142159X.2020.1779920.