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Research Article

Training Medical Teachers for Designing Curriculum for Open Distance Learning Programmes Using Flipped Classroom

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A B S T R A C T

Introduction: Medical teachers play a pivotal role in bringing forth competent and qualified medical professionals. Although they follow their style of teaching, they need to be updated with the latest developments and approaches to explore alternative and more effective modes of instruction.

Method: In this study, a flipped classroom approach adopted for training the medical fraternity for curriculum planning and the use of online tools for teaching learning was analysed for its effectiveness and satisfaction among the participants.

Results: It was found that 40% were able to correctly frame objectives, 67% had their videos uploaded on YouTube, and 80% had online assessment tools. 83% were confident in sharing Google Docs, 75% in organising Google Meet, 67% undertake website development and 54% confident in curriculum development for an Open Distance Learning programme.

Conclusion: The participants were highly satisfied with the online sessions, enjoyed working with their peers, and responded that skills like video and assessment preparation would be very useful in their day-to-day teaching.

Keywords: Flipped Classroom, Open and Distance Learning, Medical Education, IGNOU

Introduction

The global spread of the novel coronavirus disease (COVID-19) had an unprecedented impact on all aspects of life including education. With the call for lockdown by most countries globally as well as internally by states in India, teachers struggled to find solutions for teaching-learning interactions. Medical education was no exception. The impending need for using technology for education was felt and most educators across the country including the medical fraternity were grappling to adapt their curricula for alternate modes of delivery essentially through online platforms and using social media.

Researchers have shown that for adopting online and technology-enriched teaching, medical teachers and instructors have to deal with many challenges such as the innovative paradigms of higher education, and new methods of teaching and learning.[1,2] They need to know how to adapt pedagogical practices that are more compatible with the integration of technology at the postsecondary level. These teachers have to learn how to deal with stress and feelings of frustration while making the transition to online learning environments.[2,3]

The medical education system in India is the largest in the world consisting of 555 medical colleges with an intake capacity of 83,175 students as of 2021. Hence training this large workforce is a mammoth task. Recognising this need, the National Medical Commission of India has a faculty development programme (FDP) in place with the main aim of improving the quality of medical training by training teachers.[4] However, this FDP adopts a face-to-face training mode and is also oriented to the principles and guidelines for a conventional teaching mode. The COVID crisis required doctors to understand the pedagogy of open and distance education to enable them to orient their curricula and methodology of teaching-learning accordingly.

Indira Gandhi Open University (IGNOU) being the leader in open and distance learning was approached by the medical fraternity for orientation and training for re-organising and delivering their medical curriculum through alternative methods to conventional teaching. Many studies have concluded that Distance learning courses focusing on educational leadership and pedagogy for medical teachers can be an option to reach a wider audience.[4,5] Researchers also predicted that even after COVID-19 resolves emergent technology will be expected to continue to be used in medical education.[6]

The medical faculty of IGNOU decided to take up this challenge of training the medical fraternity of conventional colleges in planning, curriculum development, and preparing delivery models of medical courses. It was decided to conduct workshops for the training. Several studies have documented that teachers have found workshops for training programmes in the area of medical education very useful.[7–9] A flipped classroom approach was planned for the training.

A flipped classroom is a pedagogical model in which the individual pace is replaced by the group pace which makes, the learning environment active and interesting. It brings out the creativity in the learners and the teachers only provide guidance.[10] The flipped classroom adopts a learner-centric approach in which the student plays an active role in learning and the teacher is a facilitator for motivating and guiding the learner and receiving feedback on students' performance.[11] A flipped classroom approach aims at developing higher-order cognitive skills like analysis synthesis and evaluation which can be very useful for competency development in a medical teacher.[12]

Keeping in view the problem and its context as described above, the objectives of the study were formulated as follows: 1) to assess the effectiveness of using the flipped classroom approach for training medical teachers to design curriculum for ODL programmes; 2) to document satisfaction with the flipped classroom methodology among the medical faculty; and 3) to analyse the strengths and weaknesses of the Open and Distance Learning (ODL) mode of education as perceived by medical teachers.

Methods

Research Methodology

A mixed methods approach was adopted. Both qualitative and quantitative data were collected from the participants of the study and analysed.

Population and Sample

A total of 54 participants registered for the workshop (Schedule – Appendix 1). A flipped classroom approach was adopted for the training (Appendix 2). The participants shared reference material before the workshop, immediately after registration along with the objectives of the workshop (Objectives – Appendix 3). During the workshop, the participants were sensitised through sessions on the pedagogy of ODL, principles of curriculum planning for the ODL mode, and technological skills used for online education. The participants were divided into groups and instructed to undertake individual (targeted at a lower order of thinking skills) and group tasks (targeted at a lower order of thinking skills) in between the sensitisation sessions. Participants presented their activities during the workshop sessions in an open forum. All the participants were included in the study. The study was carried out during May 26–31, 2020. Informed consent was obtained from all participants before the study was undertaken.

Tools Used

Semi-structured questionnaires were delivered through Google Forms to all the participants. All the questionnaires were tested for their validity and reliability by circulating the same among distance education experts and pre-tested on a sample group of 5 participants. The questionnaires were finalised and shared among the participants.

The activities undertaken by the participants at individual and group levels were assessed using the rubric given in Appendix 4 which was also pretested for reliability and validity before administering to the participants.

Procedure

Basic identification data, opinions regarding the need for

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training, and information on technology-related skills were collected with the registration forms. Feedback regarding the individual sessions was collected using semi-structured questionnaires. Feedback was also obtained from the participants regarding their views on the strengths and weaknesses of the ODL mode of education. All the activities were analysed using the rubric as placed in Appendix 4.

Results

Participant Profile

Fifty-four participants registered for the workshop. Personal information was collected through registration using Google Forms. 41 (76%) of the participants were faculty in the medical and 31 (57%) were from clinical specialisations. The teaching experience varied from 3 to 50 years, with a maximum of participants having 10 to 19 years of experience. 17 (31%) participants were from countries outside India, namely Saudi Arabia, Bangladesh, Bahrain, Cairo, Helwan, Malaysia, UAE Libya. 42 (78%) participants were working in government or public sector (Table 1).

Table 1.Characteristics of the Participants

(N = 54)

S. No.	Characteristics	Values	n	%
1	Age (years)	30–39	14	27.8
		40–49	23	42.6
		50–59	14	25.9
		≥ 60	3	55.6
2	Gender	Male	26	48.1
		Female	28	51.9
3	Designation of the participants	Head of institution or department	6	11.1
		Faculty in medical college	41	75.9
		Doctor	8	14.8
4	Subject specialisation*	Clinical	31	57.4
		Para-clinical	16	29.6
		Pre-clinical	7	13.0
5	Years of teaching experience	0–9	13	24.1
		10–19	28	51.9
		> 20	13	24.1
6	National/ international participants	International	17	31.5
		National	37	68.5
7	Nature of institution z	Private	12	22.2
		Public/ government	42	77.8

*Clinical included doctors with qualifications in clinical subjects like Medicine, Surgery, Obstetrics and Gynaecology, Ophthalmology, ENT, Geriatrics, Paediatrics, etc.

Para-clinical included subjects like Pathology, Microbiology, Community Medicine, etc.

Pre-clinical included subjects like Anatomy, Physiology, Medical Education, etc.

Assessing the Effectiveness of Using the Flipped Classroom Approach

Feedback was obtained from the participants regarding the use of technology for teaching before the workshop. The most common reason cited for enrolling in the workshop was that the participants wanted to learn curriculum development and the skills related to online education and distance learning including assessment through the online mode. A few of them wanted to update themselves and also learn skills related to creating videos and developing websites.

Pre-workshop Knowledge and Skills

In response to the semi-structured questionnaire, it was found that only 12 (22%) participants had prepared Google Sites and had used it for uploading resources, videos, audio, and discussion forums. 17 (31%) participants had used the classroom as a platform for their teaching. Other platforms used by a couple of participants were Socrative, Kahoot, Slido, Padlet, Facebook live, and Avaya workplace, 12 (22%) participants had prepared their video, 4 had used iMovie, 2 had used the screen recording, 2 used Kinemaster, 3 using phone video, 1 by Camtasia. 6 (11%) had uploaded on YouTube and 3 had made their channel. 15 participants were confident in teaching their peers, of which 3 were using the classroom, 5 were using Zoom, 1 was using Microsoft Teams, and 2 were using Google Forms.

Competencies Achieved by the Participants

The competencies achieved by participants for the individual activities in the workshop as evaluated by the organisers of the workshop are listed in Table 2. Two of the participants did not carry out the individual activities. The competencies achieved by participants for the group activities as reported by the individual participants, in the workshop are listed in Table 3.

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Table 2.Competencies Achieved by Participants During Individual Activities

Type of Activity	Description	n (%)
Framing objectives	Correctly framed all objectives	17 (40)
	Only a couple of objectives were not in behavioural terms	19 (45)
	Could not frame any objective correctly	5 (11)
	Did not have clarity regarding the different domains while framing objectives	4 (10)
Preparation of video	Successfully able to prepare videos and upload them on YouTube	32 (66.7)
	Able to create my own channel on YouTube	18 (43.8)
	Did not get time for the activity	7 (14.6)
	Not able to produce a video, would require more training	3 (6.3)
Preparation of own assignment	Was successfully able to produce my own tool with pictures and video	22 (45.8)
	Prepared a simple tool without pictures and video	17 (35.4)
	Did not have time	86 (12.5)
	Will require more training	6 (12.5)

Table 3.Competencies Achieved by Participants in Groups

Group Activity	Yes, and I am very confident in undertaking the activity	I Contributed but would require more training	I could not comprehend much	I did not get much time	I did not attempt
Website development	32	14	3	1	-
Sharing Google Docs	40	7	2	-	-
Curriculum design	26	19	1	2	-
Programme package	18	24	3	4	-
Implementation design	18	22	2	4	1
Assessment plan for the programme	26	18	1	3	-
Arranging a Google Meet	36	8	3	1	-
Total	48	-	-	-	-

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The effectiveness of the workshop in achieving the skill development in the participants was accessed by the organisers of the workshop using the rubric and is presented in Figure 1.

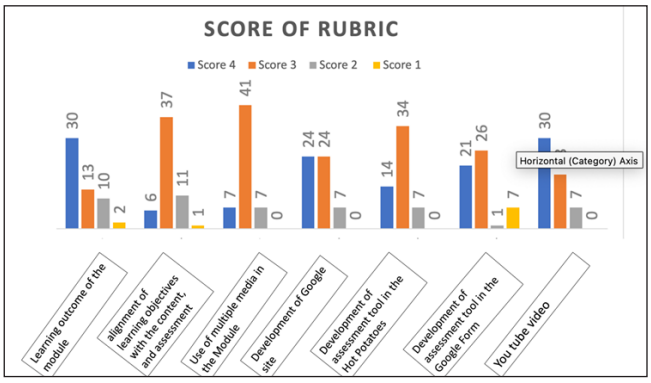

Figure 1.Score of Rubric for Assessment of the Competencies Achieved

Satisfaction Level Among the Medical Faculty as Participants of the Workshop

Feedback was obtained for the communications, resources shared and the online sessions held.

Satisfaction with the Communications

The participants expressed satisfaction with the communications during and between the workshop sessions. 31 (62%) participants found WhatsApp as the most useful means of communication followed by 16 (32%) for Google Meet and 3 found e-mail most useful.

Satisfaction with the Resources Shared

Several resources were shared with the participants before the classes. Out of the 37 respondents, 73% of the participants found the resources i.e. programme guides, handbook of e-learning and manual of course writers, practical manuals, checklist manuals, log books very useful. 86.5% found the recorded videos of the sessions useful and 81.1% found the web portal prepared for the workshop very useful.

Satisfaction with the Online Sessions

All the participants felt all the sessions to be excellent or very good regarding the relevance of the topic, clarity of content, quality of audio, quality of video and utility of content. Table 4 shows their feedback for the sessions.

Table 4. Feedback on the Online Sessions – Excellent/ Very Good

Session	Relevance of the Topic n (%)	Clarity of Content n (%)	Quality of Audio n (%)	Quality of Video n (%)	Utility of Content n (%)
1: Introduction to open and distance learning	32 (86.5)	30 (81.0)	30 (81.0)	30 (81.0)	29 (78.4)
2: Pedagogy approach of ODL in health sciences programmes	26 (70.2)	31 (83.8)	30 (81.0)	30 (81.0)	30 (81.0)
3: Designing curriculum on ODL and experience of IGNOU	29 (78.4)	31 (83.8)	31 (83.8)	31 (83.8)	31 (83.8)
4: Preparation of website in the Google Sites	28 (75.7)	30 (81.0)	28 (75.7)	28 (75.7)	28 (75.7)
5: Challenges in the assessment in the ODL system	30 (81.0)	29 (78.4)	28 (75.7)	30 (81.0)	29 (78.4)
6: Road map of theory and practical training	30 (81.0)	27 (73.0)	25 (67.6)	29 (78.4)	29 (78.4)
7: Preparation of assessment tool using Google Forms	32 (86.5)	31 (83.8)	29 (78.4)	29 (78.4)	29 (78.4)
8: Preparation of assessment tool using Hot Potatoes	28 (75.7)	27 (73.0)	27 (73.0)	28 (75.7)	21 (56.8)

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Satisfaction with the Methodology of the Flipped Classroom

A mid-workshop feedback was taken on the third day to assess the problems that the participants may be facing while working in groups under the flipped classroom concept. The satisfaction for the various activities is listed in Table 5.

Table 5.Feedback on Activities

S. No.	Activity	Level of Satisfaction	n (%)
1	Assessment tool or uploading of video	There was no problem.	31 (62)
		There was a problem but it was resolved easily.	18 (36)
		There was a problem but it was resolved with great effort.	1 (2)
		There was a problem and it could not be resolved.	0 (0)
2	Sharing documents while working on a module by using Google Docs	There was no problem.	39 (78)
		There was a problem but it was resolved easily.	9 (18)
		There was a problem but it was resolved with great effort.	0 (0)
		There was a problem and it could not be resolved.	1 (2)
3	Making own website	There was no problem.	40 (80)
		There was a problem but it was resolved easily.	8 (16)
		There was a problem but it was resolved with great effort.	1 (2)
		There was a problem and it could not be resolved.	0 (0)
4	Activities which restricted interaction in a group (50 responses)	Your commitments at work	24 (48)
		Connectivity issues	16 (32)
		Problems due to different time zones	4 (8)
		Technological knowledge difference from other participants	10 (20)
		The difference in experience regarding the subject	9 (18)
		Constraints of time for the complexity of the task	14 (28)
		No restriction felt	11 (22)
5	Other issues faced while working in the group	Inadequate input from a few members	16 (32)
		Conflicting ideas among members of the group	4 (8)
		Low interactivity due to time zone differences	7 (14)
		Low interactivity due to official commitments of few	12 (24)
		Difficulty in discussions because of differences in subject specialisation	7 (14)
		No issues felt	24 (48)
6	Most enjoyed while working in the group	Freedom to work as per own time and pace	28 (56)
		Freedom to work from your own place	29 (58)
		Interacting with people from different disciplines and experience	35 (70)
		Learning new skills useful in future	43 (86)
		A stress-free learning environment	22 (44)

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Satisfaction for the Utility of the Activities in Their Day-to-Day Work

The components that the participants felt become useful after the workshop for their day-to-day work are Google Forms for assessment (97.3%), preparation of video and sharing with students (89.2%), sharing Google Docs for academic and research purposes (81.1%), website of your academic purpose (81.1%), design and development of a module on the training of health professionals (78.4%) and broadcasting in YouTube for the academic purpose (62.2%). 32 (66.7%) would be interested in planning and developing a programme on medical education and 43 (89.6%) in planning and developing a programme on any topic of continuing medical education of their specialisation. 33 (68.8%) would be interested in training students in a programme through ODL/ online, 27 (56.3%) in preparation of audio-video components, and 32 (66.7%) in housing an ODL programme in their institution. 86% found learning new skills to be useful for future teaching and learning while working in groups.

Analyses of the Strength and Weakness of the ODL Mode of Education as Perceived

In response to the questions on what the participants felt was the strength of the ODL method of education, 29 (58%) participants mentioned the freedom to work from one's own place, 28 (56%) mentioned the freedom to work in one's own time and pace, 29 (58%) felt the opportunity to interact with people from different disciplines and varied experience, and 22 (44%) stated a stress-free learning environment.

Weakness of ODL Mode as Perceived

Feedback was taken from the participants regarding the weakness of the ODL mode of education as perceived by them from a student's perspective and a teacher's perspective.

Some of the issues linked with the online mode of learning from a student's perspective, as identified by the faculty were as follows:

- No personal touch in the learning process
- The absence of face-to-face interaction leading to many questions being unanswered
- Constant disturbance and distractions in their local environment and hence unable to focus
- Constant motivation required to continue activities
- Differences in baseline knowledge, technical knowledge, and experience keep the pace of learning different for different people
- Absence of guidance and supervision of hands-on training
- Missing classes resulting in lagging behind in understanding subsequent concepts

Some of the issues that a teacher in the online system can face were identified by the participants as follows:

- A lot of background preparation is required.
- Technological familiarity and expertise of the teacher are required.
- Communication issues with the students due to internet connectivity problems can be a hurdle in teaching-learning.
- Time clashing with the duty hour or other commitments of the students can result in stress and difficulty in finding a common time slot.
- Technological knowledge of students, and availability of hardware and software for the classes may be a deterrent to learning.
- Differences in the baseline knowledge and varied experiences of the students can be a challenge in deciding the teaching strategies.
- No eye-to-eye contact, so difficult for the teachers to know the attention span of the student and his reactions to the teaching, and non-verbal communication is practically non-existent.
- Personalising teaching, motivating students, encouraging interactions, and trying to involve all students are difficult since students are not visible.

Discussion

The roles and competencies of a faculty adopting the online mode of teaching can be divided into –content knowledge, pedagogy, and technology.[13] The faculty needs to possess good teaching practices to foster effective learning by the students. These include framing realistic outcome objectives and aligning the curriculum and assessments to the objectives, facilitating synchronous, and asynchronous interaction between teacher and student and encouraging the development of higher-order thinking skills, self-directed learning, and active learning by the students. There should be an inbuilt component of feedback with continuous monitoring and mentoring of the learners. A built-in diversity that allows for teaching using multiple media to cater to the diverse learning styles of the learners is useful.[5]

Most of the faculty receive very little training for teaching in higher education.[2] In the case of online teaching and learning, the first and foremost requirement for a good teacher is to be able to articulate his readiness to adopt the changed mode of teaching using technology with online methods. Teachers in the conventional system often feel that the instructional designs, assessment procedures,

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etc., would remain the same when migrating to the online environments. However, when they realise that these two environments are very different they feel the need for training programmes to enhance their skills in online teaching.[14] This need was also expressed by the medical faculty from different parts of the country as well as other countries and based on this felt need the online workshop was organised.

Teaching and training courses using online mode with technology incorporated require compatible pedagogical practices with the integration of technology at the postsecondary level.[15]

The participants who registered for the workshop were highly motivated medical teachers aspiring to learn skills to enable them to prepare curriculums and deliver medical programmes through open and distance learning. Hence it was proposed to impart the training using a flipped classroom approach so that higher-order thinking skills could be achieved.

Planning for the flipped classroom includes the needs assessment of the students, framing learning outcomes, and finalising the content followed by selecting the appropriate assessment methods.[16] An initial survey to assess the learning needs of the participants revealed that many of them were not very familiar with the various tools used in online teaching like Google Sites (39/54), had never prepared a video (32/54), and were not very confident in teaching using the web conferencing tools (38/54). Hence the workshop included orientation of participants to the pedagogy coupled with training them how to use technology for online teaching.

Implementing the flipped classroom approach involves pre-class, in-class, and post-class activities.[17,18] This methodology was followed for the training. A brief introduction through an online session was followed by providing the participants with resource materials in the form of PDF books, articles, handouts, and videos in a web portal created for the training programme. The participants were asked to undertake a series of pre-class activities at individual as well as group levels guided as per need by the resource materials provided and discussions among peers and trainers. Interactive sessions were taken through web conferencing platforms using Google Meet for the workshop sessions which included presentations by the individual students and groups followed by interactions and critical analysis.

The individual activities help those students who need more individual reflective time to learn while the group activities help the students to engage in the group discussions by contributing to their understanding of the concept to bring out new understandings and application of the concepts. There was immense peer-to-peer learning. Post-class activities involved refining the presentations and documents, videos, sites, and assessments prepared by the students and uploading the same to their web portal page. It also encouraged the slow learners to develop their competencies and catch up with the rest of the group.

The success of the flipped classroom depends upon three factors –(i) inculcating critical thinking (ii) keeping the participants fully engaged (iii) stimulating a deep understanding of the material.[19] We found training medical teachers through the flipped classroom for developing programmes through open and distance learning to be a useful approach. 85% of the 48 participants were able to correctly frame all or most of the objectives, 67% of the participants were able to prepare their own videos and many were even able to upload the prepared video in channels created by themselves, and 73% were able to prepare assessment tools.

Feedback on working with the flipped classroom approach revealed that 29 (53%) liked the freedom to work in their own place, time and pace, 22 (41%) experienced a stress-free environment and 28 (52%). enjoyed interacting with people from different disciplines.

A few studies have reported that students prefer flipped classrooms over lectures.[20–22] The advantages of flipped classrooms cited by researchers include a positive impact on learning,[23,24] access to online multimedia resources like videos which can be viewed anytime and anywhere and students can learn at their own pace,[25–27] students that are educated with this approach get motivated to think both within and out of class,[28] interacting with peers[29,30] and instructors[31,32] and greater self-confidence[29,33]. In a flipped classroom students get more time to research the subject matter.[34]

Another advantage of a flipped classroom approach is that more time can be spent on thinking skills and the students can actively learn and gain knowledge while simultaneously evaluating their knowledge.[35]

Few issues related to working in the groups were – inadequate inputs from some of the group members 16 (30%), conflicting ideas in the group 4 (7%) and the difference in specialisation 7 (13%), experience 9 (17%), technical knowledge 10 (19%) and time zones 4 (7%) of the participants came in the way of discussions. Participants also were restricted in their work due to commitment at their work 25 (46%) and connectivity issues 16 (30%).

Disadvantages of the flipped classroom include the difficulties of preparing good videos[34] (and the compulsion to watch long videos which may not have the attention of the viewer,[36,37] time constraints,[38] and the issues associated with adjusting to a new and unfamiliar methodology,[39] lack of devices like such as smartphones, tablets or desktops or

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laptops and internet problems[40].

This workshop was a unique setting in which the teachers were being trained as students. Hence the teachers gained an insight into the issues associated with online learning both from a student's perspective as well as a teacher's perspective. The main advantages that they felt for an ODL programme included the freedom to work in their place, place, and time, working with people from different disciplines and experiences, and working in a stress-free environment.

Their main concerns from a student's point of view were a lot of disturbance and distractions, low level of motivation and no personal touch. From a teacher's point of view, the issues were limited technological know-how, absence or low level of interactions during the class and difficulty in assessing the understanding level of the students. Other researchers have found similar problems. Technology used in online courses can be frustrating resulting in a demotivating factor,[41] teachers may find it difficult to prepare assessments and take tests[42] and it is required to develop feedback mechanisms between the teachers and students[43].

Although there are hurdles in online education, they can be easily overcome with technology to ensure an effective mode of teaching-learning.

Researchers have recommended that faculty development workshops are much needed to develop different attributes in medical teachers so as to be able to deliver online learning. Studies have shown that the flipped classroom method enhances learning when compared to other methods like the speech method.[44,45] Our study showed that the training was successful in terms of imparting the technological and pedagogical skills that the participants had desired to learn. Further, they found themselves competent enough to use these skills in their day-to-day teaching and many of them were ready to be associated with IGNOU as programme developers and in housing IGNOU programmes in their institutions.

Conclusion

This study concluded that the participants found the flipped classroom approach to be very effective. They were able to achieve most of the objectives set for the workshop. They were highly satisfied with the different modes of communication, the online classes, and the method of conducting training where they had a chance to interact with peers from different disciplines and varied experiences. They felt that although the open and distance mode has the advantages of freedom to work in their place and pace it needs to be strengthened for individual attention and increasing motivation of a distance learner.

There is a need to develop it in a more structured way with flexibility in its delivery mechanism. Various challenges like inadequate technical infrastructure, insufficient preparedness of faculty, pedagogical insecurity, time constraints, etc need to be addressed. However, in light of its advantages in terms of effectiveness and optimal resource utilisation, the flipped classroom has the potential for inclusion in mainstream medical education in the future.

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References

1. Siemens G, Matheos K. Systemic changes in higher education. In Educ [Internet]. 2012 Dec 10 [cited 2023 Jul 10];16(1):3-18. Available from: https://journals.uregina.ca/ineducation/article/view/42 [Google Scholar]
2. Palloff RM, Pratt K. Lessons from the virtual classroom: the realities of online teaching. Oxford: John Wiley & Sons; 2013. [Google Scholar]
3. Alman S, Tomer C, Lincoln ML. Designing online learning: a primer for librarians. a primer for librarians. ABC-CLIO; 2012. [Google Scholar]
4. Zodpey S, Sharma A, Zahiruddin QS, Gaidhane A, Shrikhande S. Faculty development programs for medical teachers in India. J Adv Med Educ Prof. 2016;4(2):97-101. [PubMed] [Google Scholar]
5. Saiyad S, Virk A, Mahajan R, Singh T. Online teaching in medical training: establishing good online teaching practices from cumulative experience. Int J App Basic Med Res. 2020;10(3):149. [PubMed] [Google Scholar]
6. Goh PS, Sandars J. A vision of the use of technology in medical education after the COVID-19 pandemic. MedEdPublish (2016). 2020;9:49. [PubMed] [Google Scholar]
7. Ozyeshil Z. Five factor personality traits as predictor of trait anger and anger expression. Educ Sci. 2012;37(163):322-31. [Google Scholar]
8. Abdulahad FH, Saleh AM, Shabila NP. Introduction and initial evaluation of a newly designed teaching course for medical faculty members in Erbil, Iraq. Middle East J Family Med. 2012;10(4):38-44. [Google Scholar]
9. Jamal S, Rana MH, Safdar CA, Khan A, Shukr I. Short duration medical education workshops-analysis of participants' response. Pak Armed Forces Med J. 2012;62(1):115-8. [Google Scholar]
10. McLean S, Attardi SM, Faden L, Goldszmidt M. Flipped classrooms and student learning: not just surface gains. Adv Physiol Educ. 2016 Mar;40(1):47-55. [PubMed] [Google Scholar]
11. Zainuddin Z, Attaran M. Malaysian students' perceptions of flipped classroom: a case study. Innov Educ Teach Int. 2016;53(6):660-70. [Google Scholar]

12. Rowe M, Frantz J, Bozalek V. Beyond knowledge and skills: the use of a Delphi study to develop a technology-mediated teaching strategy. BMC Med Educ. 2013;13(1):51. [PubMed] [Google Scholar]
13. Bawane J, Spector JM. Prioritization of online instructor roles: implications for competency-based teacher education programs. Distance Educ. 2009;30(3):383-97. [Google Scholar]
14. Franklin T, Blankson J. Together and alone: the instructional, technical, and psychological outcomes of faculty building online courses. Proceedings of the Society for Information Technology & Teacher Education International Conference. Association for the Advancement of Computing in Education (AACE); 2001. p. 659-64. [Google Scholar]
15. Bailey CJ, Card KA. Effective pedagogical practices for online teaching: perception of experienced instructors. Internet High Educ. 2009;12(3-4):152-5. [Google Scholar]
16. Lockyer J, Ward R, Toews J. Twelve tips for effective short course design. Med Teach. 2005;27(5):392-5. [PubMed] [Google Scholar]
17. Singh K, Mahajan R, Gupta P, Singh T. Flipped classroom: a concept for engaging medical students in learning. Indian Pediatr. 2018;55(6):507-12. [PubMed] [Google Scholar]
18. Estes MD, Ingram R, Liu JC. A review of flipped classroom research, practice, and technologies. Int HETL Rev. 2014;4(7):1. [Google Scholar]
19. Gillispie V. Using the flipped classroom to bridge the gap to generation Y. Ochsner J. 2016;16(1):32-6. [PubMed] [Google Scholar]
20. Lasry N, Dugdale M, Charles E. Just in time to flip your classroom. Phys Teach. 2014;52(1):34-7. [Google Scholar]
21. McLaughlin JE, Roth MT, Glatt DM, Gharkholonarehe N, Davidson CA, Griffin LM, Esserman DA, Mumper RJ. The flipped classroom: a course redesign to foster learning and engagement in a health professions school. Acad Med. 2014;89(2):236-43. [PubMed] [Google Scholar]
22. Murphree DS. "Writing wasn't really stressed, accurate historical analysis was stressed": student perceptions of in-class writing in the inverted, general education, university history survey course. Hist Teacher. 2014;47(2):209-19. [Google Scholar]
23. Larson S, Yamamoto J. Flipping the college spreadsheet skills classroom: initial empirical results. J Emerg Trends Comput Inform Sci. 2013;4(10):751-8. [Google Scholar]
24. Lucke T, Keyssner U, Dunn P. The use of a classroom response system to more effectively flip the classroom. In: 2013 IEEE Frontiers in Education Conference (FIE) [Internet]. Oklahoma City, OK, USA: IEEE; 2013 [cited 2023 Jul 10]. p. 491-5. Available from: http://ieeexplore.ieee.org/document/6684872/ [Google Scholar]
25. Forsey M, Low M, Glance D. Flipping the sociology classroom: towards a practice of online pedagogy. J Sociol. 2013;49(4):471-85. [Google Scholar]
26. Yeung K. Making 'The Flip' work: barriers to and implementation strategies for introducing flipped teaching methods into traditional higher education courses. New Dir Teach Phys Sci. 2014;(10):59-63. [Google Scholar]
27. Fulton K. Upside down and inside out: flip your classroom to improve student learning. Learn Lead Technol. 2012;39(8):12-7. [Google Scholar]
28. Kellinger JJ. The flipside: concerns about the "new literacies" paths educators might take. Educ Forum. 2012;76(4):524-36. [Google Scholar]
29. Ferreri SP, O'Connor SK. Redesign of a large lecture course into a small-group learning course. Am J Pharm Educ. 2013;77(1):13. [PubMed] [Google Scholar]
30. Ryan BJ. Flipping over: student-centred learning and assessment. J Pers Appl Acad Pract [Internet]. 2013 [cited 2023 Jul 10];1(2):30-9. Available from: https://jpaap.ac.uk/JPAAP/article/view/64
31. Lage MJ, Platt GJ, Treglia M. Inverting the classroom: a gateway to creating an inclusive learning environment. J Econ Educ. 2000;31(1):30. [Google Scholar]
32. Slomanson WR. Blended learning: a flipped classroom experiment. J Legal Educ. 2014;64(93). [Google Scholar]
33. Pierce R, Fox J. Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. Am J Pharm Educ. 2012;76(10):196. [PubMed] [Google Scholar]
34. Herreid CF, Schiller NA. Case studies and the flipped classroom. J Coll Sci Teach. 2013;42(5):62-6. [Google Scholar]
35. Evans L, Bosch ML, Harrington S, Schoofs N, Coviak C. Flipping the classroom in health care higher education: a systematic review. Nurse Educ. 2019;44(2):74-8. [PubMed] [Google Scholar]
36. Boucher B, Robertson E, Wainner R, Sanders B. "Flipping" Texas State University's physical therapist musculoskeletal curriculum: implementation of a hybrid learning model. J Phys Ther Educ. 2013;27(3):72. [Google Scholar]
37. Guerrero S, Baumgartel D, Zobott M. The use of screencasting to transform traditional pedagogy in a preservice mathematics content course. J Comput Math Sci Teach. 2013;32(2):173-93. [Google Scholar]
38. Butt A. Student views on the use of a fipped classroom approach: evidence from Australia. Bus Educ Accredit. 2014;6(1):33-44.
39. Strayer JF. How learning in an inverted classroom influences cooperation, innovation and task orientation. Learn Environ Res. 2012;15(2):171-93. [Google Scholar]

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40. Kordyban R, Kinash S. No more flying on autopilot: the flipped classroom. Educ Technol Sol. 2013;56:54-6. [Google Scholar]
41. Pollock PH, Wilson BM. Evaluating the impact of internet teaching: preliminary evidence from American National Government classes. Polit Sci Polit. 2002;35(3):561-6. [Google Scholar]
42. Shuey S. Assessing online learning in higher education. J Instruct Deliv Syst. 2002;16:13-8. [Google Scholar]
43. Wijekumar K, Ferguson L, Wagoner D. Problems with assessment validity and reliability in web-based distance learning environments and solutions. J Educ Multimed Hypermed. 2006;15(2):199-215. [Google Scholar]
44. Sohrabi Z, Keshavarzi MH, Pourbairamian G, Ramezani G, Ghanavati S. Flipped classroom & Kirkpatrick: steps toward innovation in education & evaluation. Biomed J Sci Tech Res [Internet]. 2020 [cited 2023 Jul 10];29(3):2489-94. Available from: https://biomedres.us/fulltexts/BJSTR.MS.ID.004811.php
45. Osman SZ, Jamaludin R, Mokhtar NE. Flipped classroom and traditional classroom: lecturer and student perceptions between two learning cultures, a case study at Malaysian Polytechnic. Int Educ Res. 2014;2(4):16-25. [Google Scholar]

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Appendix I

Schedule of Workshop

Date	Orientation Sessions	Expected Outcome in Individual and Group Activities	Duration of Sessions
May 24, 2020	1. Oriented to the objectives of the workshop and the methodology of training, the pedagogy approach of ODL in health sciences programmes 2. Designing curriculum on ODL and experience of IGNOU	i. Identify and finalise the target group ii. Decide the level of the programme iii. Frame outcome objectives of the programme	2 hours 19 min
May 25, 2020	1. Preparation of website in the Google Sites 2. Preparation classroom in Google Classroom and use of YouTube	i. Create a web portal for the programme. ii. Prepare a video, create your own channel on YouTube and upload the prepared video on YouTube.	2 hours 15 min
May 27, 2020	1. Presentation of the module prepared by two groups 2. Preparation of assessment tool using Google Forms 3. Road map of theory and practical training and preparation of teaching module for ODL learners and experience of IGNOU	i. Select a programme package ii. Prepare an implementation design	2 hours 15 min
May 30, 2020	1. Preparation of assessment tool using Hot Potatoes 2. Presentation of the teaching module prepared by participants and feedback on integration of the different components of the module	i. Create formative assessment	2 hours 16 min
May 31, 2020	i. Discussion on how to conduct practical assessments online ii. Feedback given in the formative assessment iii. Presentation of the teaching module prepared by participants and feedback given	iv. i. Modify the programme package and assessment patterns as per discussion	2 hours 23 min

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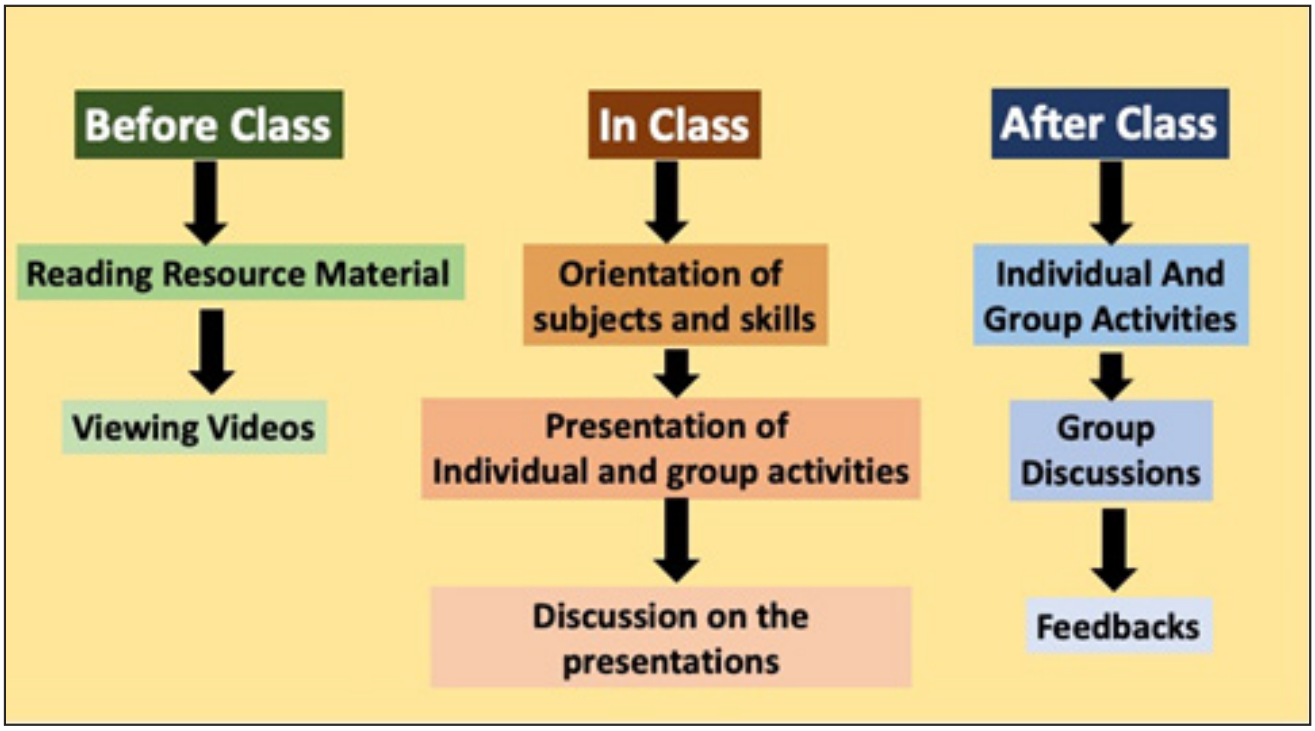

Appendix 2. Adopted Model of Flipped Classroom

Appendix 3

Objectives of the Workshop

Training medical faculty was planned to enable them to design the curriculum for ODL programmes. After completion of the workshop, the participants were expected to be able to:

- Design curriculum for a module/ course in ODL mode;
- Create own website, Google Classroom, and videos for uploading on YouTube;
- Demonstrate integration of different types of media like Google Sites, Google Classroom, and YouTube in the teaching-learning process;
- Design an assessment tool using Google Forms and Hot Potatoes application and incorporate them in the Google Sites and Google Classroom; and
- Analyse the strengths and weaknesses of the Open and Distance Learning (ODL) mode and multiple media used in ODL.

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Appendix 4

Rubric for the Measurement of Outcome of the Online Workshop by Assessing the Performance of the Participants

Component	Distinguished (4)	Proficient (3)	Satisfactory (2)	Unsatisfactory (1)
Learning outcome of the module	All the learning outcome objectives of the module/ course are in behavioural terms.	More than 50% of the learning objectives are in behavioural terms.	Less than 50% but more than 10% of the learning objectives are in behavioural terms.	Less than 10% of the learning objectives are in behavioural terms.
Alignment of learning objectives with the content and assessment	The content, and assessment techniques are correctly aligned with the objectives.	Either the content or the assessment techniques are correctly aligned with the objectives.	Either the content or the assessment techniques are partially aligned correctly with the objectives, but not all objectives have been covered.	Neither the content nor the assessment techniques are correctly aligned with the objectives.
Use of multiple media in the Module	Developed multiple media, like print, e-content, audio, and video and all are appropriately used or linked to each other in this module	Developed multiple media, like print, e-content, audio, and video but they are not appropriately linked to each other in this module (more than 50% developed and more than 50% aligned properly)	Only a few components of required media are developed and partially linked appropriately (at least 25% developed or more than 25% aligned properly)	Required components of different media are not developed and not linked appropriately (Less than 25% developed and less than 25% aligned properly)
Development of Google Sites	The following were achieved: • Google Sites developed • Has multiple pages • Shared with the other participants • Links with videos from the website established	Google Sites developed and any other two outcomes achieved	Google Sites developed and any other one outcome achieved	Not able to develop Google Sites (or not able to achieve even another single outcome)

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Development of an assessment tool in Google Forms	The following were achieved: • An assessment tool developed in Google Forms • Has different types of questions like MCQ, checkboxes, dropdown and checkbox grid • Point values to questions and allow auto-grading. • Has been integrated with the Google Sites	An assessment tool developed in Google Forms and any other two outcomes achieved	An assessment tool developed in Google Forms and any one other outcome achieved	Not able to develop an assessment tool in Google Forms (or not able to achieve another single outcome)
Development of assessment tool in the Hot Potatoes	The following were achieved: • An assessment tool developed in Hot Potatoes • Has different types of questions like MCQ, checkboxes, dropdown and checkbox grid • Point values to questions and allow auto-grading • Has been integrated with the Google Sites	An assessment tool developed in Hot Potatoes and any other two outcomes achieved	Assessment tool in Hot Potatoes developed and any one other outcome achieved	Not able to develop an assessment tool in Hot Potatoes (or not able to achieve another single outcome)
YouTube video	The following were achieved: • Prepared a teaching video • Uploaded the same on YouTube as unlisted • Established link in the Google Sites • Found and used a creative common YouTube video for the proposed learners	Prepared a teaching video and any other two outcomes achieved	Prepared a teaching video and any other one outcomes achieved	Not able to prepare a teaching video (or not able to achieve another single outcome)
Development of own Google Classroom	The following were achieved: • Created own Google Classroom • Added learning objectives, syllabus, assignments, classroom announcements etc • Added students, • grading and returning assignments to the students	Prepared a Google Classroom and any other two outcomes achieved	Prepared a Google Classroom and any other one outcomes achieved	Not able to prepare a Google Classroom (or not able to achieve another single outcome)

Excellent: 25–28
Moderate: 24–18
Average: 12–17
Poor: < 12

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