Original Article

The Transition towards Virtual Teaching Learning Environment during COVID Pandemic : Medical Educator's Perspective

Jarina Begum[1], Syed Irfan Ali[2], D Lakshmi Lalitha[3], Manasee Panda[4], Padmini Thalanjeri[5]

Introduction : We are moving towards a technically advanced Medical Education. However, effectiveness of online Teaching, Learning (T/L) remained unknown until COVID-19 pandemic.

Aim : This study was planned to assess the perception of e-educators towards online T/L, the challenges and possible solutions during pandemic.

Methodology : A mixed method cross-sectional study was conducted among 126 medical educators through online google survey from July to September, 2020 in a Tertiary Heath Care Institute & 2 neighbouring medical college.

Result : Non-response rate was 32%, 72.2% were males, 63.9% were between 31 to 50 years of age, 58% were having 10 or more years teaching experience. 36.2% were from basic sciences, 69.5% were holding higher academic post. 61% preferred combination of face to face and e-learning Although online classes were helpful in terms of 63.8% convenience, (54%) flexibility, 77.5% felt difficulties teaching and assessing skills domain. The major challenges encountered were technical glitches, no active participation and suggested solutions were technical assistance, formative assessments and use of new T/L, assessment tools.

Conclusion : Although the change was negatively perceived, it's inevitable. Training of faculties, sensitization of students and conducive environment is needed to combat the challenges, to improve the e-education system in health profession.

We are moving towards a system where use of technology in education is very common. Although lockdowns and sudden closure of educational institutes occurred, educational programs were retained by adapting the solutions as per local condition and available resources[1].

The education sectors of India as well as World are badly impacted by this pandemic. Around 32 crore learners in India were restricted home bound unable to access the educational institute. However, it has worked as a catalyst for academic growth opportunity for various platforms and techniques, which have not been used before. The education sector has been fighting with digitising the challenges to wash away the threat of the pandemic[2]. The COVID-19 Pandemic has created uncertainty and disruption of education systems in human history, affecting teachers and

Department of Community Medicine, Great Eastern Medical School and Hospital, Ragolu, Andhra Pradesh 532484
[1]MD, Professor and Corresponding Author
[2]MD, Associate Professor
[3]MD, Professor, Department of Biochemistry
[4]MD, Professor, Department of Community Medicine, Bhima Bhoi Medical College & Hospital, Balangir, Orissa 767001
[5]MD, Associate Professor, Department of Physiology, Yenepoya Medical College, Deralakatte, Karnataka 575018
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Editor's Comment :
■ The medical education system has been affected adversely by the pandemic. However, planning appropriate strategies and timely action could help medical educators to handle challenges better and save the future of the young doctors.

learners adversely in all aspects of their lives in countries all over the Globe[3]. Online learning is an exciting way to learn about almost anything. It has bought a positive impact on the lives of students as well as teachers, using technology in the field of education. However, there is always much room for improvement and challenges in implementation as far as online teaching and learning concerned[4].

The present study was planned to assess the perception of e-educators towards the online T/L, the challenges and possible solutions during pandemic to pave the path for future transformations in Medical Education.

MATERIALS AND METHODS

A cross sectional study was carried out among 126 medical educators engaged in online teaching at a tertiary health care institute & 2 neighbouring medical colleges from July to September, 2020 after taking Ethical Committee approval (92IEC/GEMS & H/2020), using a pre-validated semi-structured

questionnaire through online google survey form. Validation was done through sending the questionnaire to 6 medical education experts and piloting it among 12 faculty members of the institution, who were excluded from actual study. The value of Cronbach alpha was 0.76 which was at acceptable range. The questionnaire was then refined further as per the suggestions & expert comments.

Perception of medical educators involved in Online Classes was collected with the help of pre-validated semi-structured questionnaire through online google survey form. The medical educators were approached by complete enumeration of all faculties of 3 Medical Colleges which was around 185 faculties. Those who responded to the questionnaire completely were included in the study and those did not respond after multiple reminders were excluded. only 126 people responded to the questionnaire, thus accounting to non-response rate of 32%. The questionnaire was sent through personal WhatsApp messages. The questionnaire had total 20 questions with 6 MCQs on demographic details, 8 MCQs on use of different online platforms, experience of teaching & assessment of knowledge, skill competencies, 2 questions of advantages, limitations on 5-point Likert scale and 4 open ended question based on what is good or bad about these online classes, various challenges & possible solutions suggested.

RESULTS

Non-response rate was 32%.72.2% were males, 63.9% were between 31 to 50 years of age. 36.2% were from basic sciences, most of them were holding higher academic post. (69.5%). Around 77.8% have no previous experience of online teaching (Table 1).

Although majority had no experience of online teaching & learning, all of them were aware of e learning and teaching through institutional orientation programme. Some of the synchronous way of e learning that the participants have used were cisco WebEx (80.9%), zoom (47.6%),WhatsApp (38.8%), google meet (35.7%), Microsoft team (16.7%), You tube (19%), Skype (7.9%) and others (6.3%) like go to Webinar, Moodle, Hangout etc. and asynchronous ways were WhatsApp(72.2%), google classroom (7.9%), google groups (2.4%), websites (35.7%), institutional LMS (9.5%) and others (2.4%).

Currently majority 47.2% were engaged in both UG and PG teaching activities, followed by only Ug or PGteaching.52.8% were contributing around 2-5 hours per week followed by 5-10 hrs/week (19.4%).

Majority (87%) of them were not comfortable with online teaching learning although it is more convenient.

Table 1 — Socio demographic profile of E- Educators (N=126)			
	Variables	Percentages	Frequency
Gender :	Male	72.2%	91
	Female	27.8%	35
Age :	<30	23.5%	29
	31 to 50	63.9%	81
	>50 years	12.6%	16
Department :	Basic science	36.2%	46
	Para Clinical	34.5%	43
	Clinical	29.3%	37
Academic Position :	Professor	27.2%	34
	Assoc. Prof	42.3%	53
	Asstt. Prof	20.3%	26
	Tutors	8.7%%	11
	Others	1.5%	2
Teaching Experience :			
	<5 years	16.7%	21
	6 -10 years	25%	32
	>10 years	58.3%	73
Online teaching experience :			
	yes	22.2%	28
	No	77.8%	98
Target learners :	UG and PG	47.2%	59
	Only UGs	36.2%	46
	Only PGs	16.6%	21
Online T/L time duration :			
	<2 hours/week	27.8%	35
	3-5 hours/Week	52.8%	67
	5-10 hours/week	19.4%	24

The common advantages perceived were continuation of teaching & learning (78%), learning new skills (72%) and digital literacy(68%) (Fig 1).

About practice of e-learning after pandemic, most of the faculties (61%) preferred combination of F2F classroom & e-learning compared to only online or F2F teaching learning.

The limitations perceived by participants were cheating (83%), difficulty in teaching and assessing Skill Component (77.5%), Less Interaction (69.5%), online fatigue (62%) and difficulty in engaging students (59%) etc (Fig 2).

All of them used PPT (100%), few used SGD (55.6%), Webinars (44.2%), Journal (23.9%) club and others like Virtual Black board or White Board
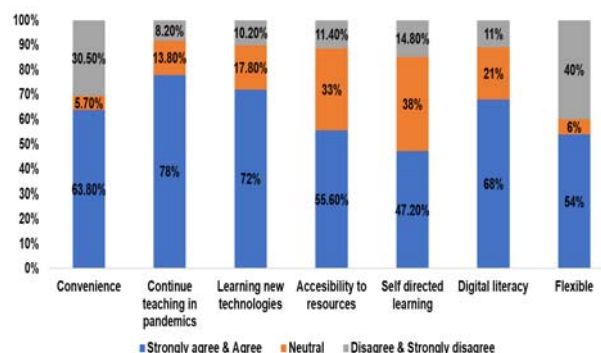

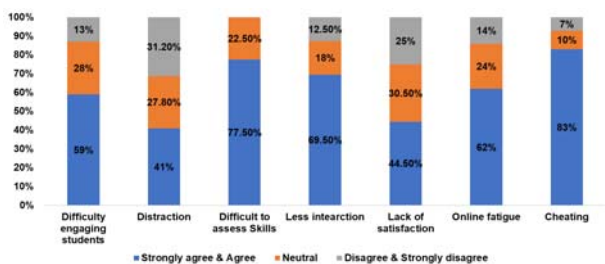Fig 1 — Advantages of online Teaching-learning (N=126)

Fig 2 — Limitations of Online Teaching- Learning:(N=126)

presentations, video-based discussion as online techniques.

Majority (62.8%) confined teaching to cognitive domain, similarly 72.2% tried formative assessment focusing on cognitive aspect (89.3%) only. The common assessment tools used were MCQ, Extended matching questions, Viva, Kahoot quiz, Google Forms, written test with essay and short answered questions etc.

32.9% tried teaching skill related competency related to their subject through video demonstration, clinical examination on family member, drawings, online roleplay, images, case scenarios and visual illustrations, very few 8.6% tried assessing the same skills.

Challenges and Possible Solutions :

The main challenge encountered was technical glitches which could be managed only by uninterrupted internet connectivity, continuous power supply and adequate training on digital literacy for both teacher and students. Similarly, there was a huge problem of non-engagement during online classes, attributed to lack of active participation and interaction among students which could be easily tackled by using new innovative and challenging teaching learning techniques and an appropriate Learning Management system, teacher training and effective feedback system (Fig 3).

The overall opinion towards the changed system of Medical education due to COVID Pandemic brought up few important verbatims (Table 2).
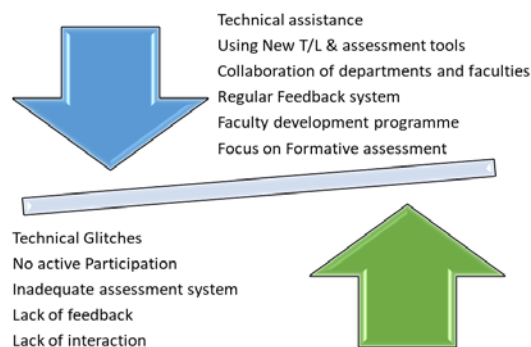

Fig 3 — Challenges and possible solutions perceived by E-educators (N=126)

DISCUSSION

In India, the COVID-19 outbreak has been declared an epidemic and lockdown was imposed on March 25, 2020, which has changed the traditional education system to the educational technologies (EdTechs) model, where teaching and assessments are conducted online[5].

In present study, majority started teaching and learning online using synchronous and asynchronous online platforms. Open education has widened the scope of learning, opened up the creative minds and scope of online learning enabling them to receive the necessary educational inputs, training and skills even during the current pandemic situation[6].

The current study observed majority were not satisfied. However, they found it as an opportunity to continue teaching during pandemics, learning new skills and becoming a digital literate. The COVID-19

Table 2 — *Verbatim by the Participants (Medical educators)*	
Positive Verbatim	**Negative Verbatim**
Online T/L is the best alternative during pandemic for keeping pace with syllabus and continue education.	Not satisfactory, non-sustainable yet only option we had, thus could be practiced as a temporary measure till pandemic ends
Change is difficult, but we had to do it anyways, so every educator must get adapted to online T/L as it provides opportunities to reach a larger section of students.	I am worried as online platforms are not much useful for medical education. Most students encounter technical problems and teachers not successful in engaging students, thus making it boring for both.
Taking the situation as curse takes us nowhere... so taking it as a challenge and keeping students engaged somehow during pandemic by online activities has helped unleashing the creativity and killing the boredom literally.	Theory is ok, but clinics, practical skills is difficult through online session, implementation of CBME components like ECE, AETCOM, FC, Integrated teaching etc were way more difficult than regular teachings.
If traditional classroom is a dish, Online/Virtual classroom teaching & learning is the salt & spice mixture. Without it the dish is bland... so we need it in future, but I must agree salt & spice only can't make up for the dish.	Online teaching is fine but can't replace physical face to face teaching and learning or assessment. We need to upgrade our entire education system to the highest level where both would be blended and become a routine part of curriculum. Or else no one can save our medical students from upcoming academic crisis.

pandemic forced us onto online platforms yet in the process medical educators evolved gradually, yet students felt that they learn better in physical classrooms (65.9%). The students also felt that the professors have improved their online teaching skills (68.1%) and online education is useful right now (77.9%), but it is stressful and affecting their health and social life.Similarly,few other studies found advantages of online learning were the ability to stay at home (69%), continuous access to online materials (69%), learning at your own pace (64%), and comfortable surroundings.The use of technologies has converted the entire teaching pedagogy to a learner centred, following which the digital literacy and expertise in technology are to be considered as the most essential qualifications[6-8].

As perceived by the study participants it was observed that cheating, difficulty in teaching and assessing skill, online fatigue were the limitations of online classes. Similarly in another study student experienced various disadvantages of online classes. There was no statistical difference between face-to-face and online learning in terms of increase knowledge, however, E-learning was considered less effective than face-to-face learning in terms of increasing skills and social competences . Students assessed that they were less active during online classes compared to traditional classes[8].

Likewise, a study showed that 54.1% of the respondents agreed that interactive discussion is achievable by means of e-learning. However, only 21.1% agreed that e-learning could be used for clinical aspects. It suggested a system for support and enthusiasm for providing valid solutions to reduce this disruption, such as online training and virtual clinical experience[9].

Despite limitations most of the faculties (61%) preferred combination of F2F classroom & e-learning compared to others after the pandemic. Likewise, among dental students, majorities agreed blended learning that combined classroom and distance learning can be implemented as Distant Learning resulted in more difficult communication and gave less learning satisfaction[10].

The current study has suggested possible solutions to challenges like training of faculties on online-teaching learning, effective feedback system and well-functioning Learning Management System (LMS). Few other studies recommended training faculty on using online modalities and developing lesson plan with reduced cognitive load and increased interactivities for maintaining academic integrity[11].

Studies has shown the pressure to deliver the content in a different platform as an e-educator made the faculties anxious and stressed. Barriers such as lack of skill and infrastructure, poor time management, and communication encountered which were planned to be tackled by encouraging effective time management, collaboration, engagement, positive online culture and maintaining interesting learning environment among student, teacher and online contents[12].

In the current study it was shown that, technical glitches and non-engagement during online classes were the major challenges faced by teachers. Similarly, four categories of barriers were noticed in another study related to home environment, institutional support barriers, technical difficulties and personal problems identified to damper their engagement in online teaching and assessments[5].

Faculties perceived it in both ways, positively and negatively mentioned in the verbatim which describes online teaching learning and assessment as best possible solution but a temporary measure to prevent academic crisis. Similarly, there was policy paralysis in handling the sudden shifting scenario of educational planning, management and organization during pandemic with their fractured technical infrastructure, academic incompetency and lack of resources. They recommended steps should be accounted in the wake of this pandemic; to develop such a curriculum that reflects the perceptible change in the content knowledge and learning experience of students as well as enable them to think critically[13].

As mentioned earlier in faculty verbatim which was collected by the open ended questions in the questionnaire, theory part was ok as far as imparting knowledge and finishing the syllabus was concerned, but the actual concern was teaching and assessing practical aspects with clinical skills and implementation of CBME components will be more difficult. Looking forward to a high quality, pedagogically sound, engaging, and collaborative online learning in the context of recently implemented CBME model and thus the COVID-19 pandemic can be realized if the medical education regulatory body (NMC), institutions and medical educators accept its need and make available-accessible and dependable digital infrastructure and technical support at institution level; training opportunities for medical educators, facilities and time for medical educators to structure and develop pedagogically sound online teaching and learning activities by aligning learning objectives, content, activities and assessment while ensuring optimal virtual

contact with learners[14].

Many faculties were concerned about the outcome of current type of medical education (where a medical student was not able to interact with a real patient).They felt online education was not much useful for medical students and for teacher Online teaching is Boring.While every student features a story of how COVID-19 has impacted their education, there is no doubt that the impacts of COVID-19 are going to be felt on a large scale. The panic within the community is visible with many confused minds. This is no different for medical students and faculty and the questions that arise regarding medical education and their future careers[15].

In another study the researcher identified vulnerabilities for students at several phases and addressed the hidden curriculum of COVID-19, its potential erosion of empathy among current medical students, and possible long-term consequences for future physicians and patients[16].

This study observed use of innovative online teaching learning strategies for covering the skill domain apart from knowledge among students. This is not only a time for advancement of medical education within the setting of active curricular innovation and transformation, but also a seminal moment for many disciplines in medicine.Several medical educators during the pandemic have used a 'develop, test and apply' model for educational innovations, reinforcing the concept of 'evidence-based medical education'[17,18].

Despite the challenges posed by the SARS epidemic, several resourceful initiatives were implemented, like the online problem-based learning technique sresulting in progress of medical education. These impressive feats illuminate how even in times of distress, solace can always be found[19].

As highlighted taking the situation as a curse takes us nowhere but taking it as a challenge will unleash the creativity. The same thoughts were shared by the author in a study where the students were satisfied with the overall shift into this collaborative e-learning environment and digital learning tools facilitated the performance and their peer sharing of knowledge. The role of informatics computer technologies was evident in promoting the students, research skills, and technical competencies[20].

Similarly, studies have found effectiveness of online teaching learning for undergraduate medical students and suggested its use in future teaching, learning and assessment programme. Other studies have mentioned that online teaching cannot replace classroom teaching, but it can complement the learner by making learning self-directed & an appropriate blending of both modes can be a step towards attaining the competency of lifelong learning[21,22].

CONCLUSION

Although the change was negatively perceived, it's inevitable. Training of faculties to become digitally literate, sensitization of students towards online education and conducive e learning environment is needed to combat the challenges during the pandemic. We must get prepared for future by addressing the issues of concern now as perceived by e-educators which will help embracing the change while transformation of medical education system.

Recommendations :

Inclusion, integration of online teaching learning at all levels of under-graduate medical education curriculum.

Development of Online teaching learning modules for future reference.

Implementation plan for online deliverable components of competency based medical education curriculum.

Awareness & Training of educators on digital literacy and use of technology and simulation-based teaching & assessment.

Innovative strategies for engaging students, remote learning, automated assessments (Formative), secured online examination (Summative) and analysis of learning outcomes.

Limitations : Online google forms, non-response, small sample, only medical educators'inclusion

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