A Descriptive Study to Assess the Perceptions of Undergraduate Medical Students Towards Acceptance of E-Learning Vs Conventional Methods in An Integrated Curriculum in Physiology

Syed Sadat Ali[1], Hifzur Rehman[2], Praveen Kumar BA[3]

[1]Associate Professor, Department of Physiology, Kanachur Institute of Medical Sciences, Mangaluru, India, [2]Assistant Professor, Department of Physiology, Career Institute of Medical Sciences & Hospital, Lucknow, India, [3]Professor, Department of Community Medicine, PES Institute of Medical Sciences & Research, Kuppam, Chittoor District, India

Abstract

Background: Institutions across the world have shifted to virtual education to keep the academic activities going due to the COVID-19 pandemic jeopardizing the academiccalendars. E-learning was being used as a part of distance learning courses but the preparedness, designing and effectiveness in using it towards conducting regular courses have been the main concern in countries where students are not used to virtual classes due to technical constraints like faculty training, suitability of devices and bandwidth availability posing a serious challenge. **Methods:** A cross-sectional, web-based study was done among 50 second year medical undergraduate students in 2020. A standardized, electronic, self-administered, Google Form data collection sheet was distributed. It included the seven components to evaluate; Course Schedule, objectives, time management, teaching methods, assessment methods, academic achievement and student concerns. Descriptive, inferential statistics were applied. **Results:** e-learning has been accepted very well by the students (48%) and they found it to add as a better learning resource (44%). About 25% of students find both e-leaning and conventional methods as convenient in learning.The major advantage in conventional methods were due to peer interaction, student-faculty interaction and active participation of faculty with feedback. **Conclusion:** Most of the students appraised that e-learning can be used as complementary to conventional methods. The conventional methods had an upper hand in long term; teaching concepts, peer interaction and faculty feedback with better planning and implementation of curricular activities holding the key for success in fulfilling the expected outcomes by either of the methods.

Keywords: *Conventional, E-learning, Perceptions, Covid-19, Pandemic, Curriculum,Virtual Education, Blackboard.*

Introduction

The outbreak of the COVID-19 pandemic led to the closure of conventional way of academic activities which made a way to the e-learning platform asan alternate method of learning across the world.

In view of the ongoing pandemic, many theories towardse-learning application have been framed. E-learning is considered as a modern and flexible mode of education and some studies have shown it to be a better alternative even though it was continuously used as a part of distance learning courses since more than a decade.

[C]orresponding author:
Dr. Syed Sadat Ali
Associate Professor, Department of Physiology, Kanachur Institute of Medical Sciences, Mangaluru – 575018, India, Ph: +91 9964318714

Recent studies project that, effectiveness of e-learning is influenced by many more factors. Access to e-learning, sudden interchange from traditional to online teaching for regular courses, social and psychological wellbeing including student and pandemic specific demographic variables have been found to have a major influence on the effectiveness of online teaching and learning process.[1-5]

The uncertainties about the preparedness, designing and effectiveness of e-learning methodologies is still not clearly understood under diverse settings. Thereby, we did a web-based study among second year medical undergraduate students following integrated curriculum to assess their perceptions towards effectiveness of the E-learning platform in comparison with traditional methods of learning by using a validated questionnaire through electronic, self-administered, Google Form data collection sheet.

Materials and Methods

A cross-sectional design was conducted under the auspices of Department of Physiology targeting second year medical undergraduate students who utilized e-learning for Immune Blood & lymphatics (IBL) module during the Covid-19 pandemic closure time. The same set of students were taught Musculoskeletal system (MSS) module earlier using traditional methods.

An online written consent was taken from each participant through the invitation to participate in the study.An electronic, self-administered data collection sheet using a Google Form was used. Three experts assessed the face and content validity of the data collection sheet.

Statistical Analysis

The data was analyzed using SPSS version 14. Descriptive statistics were done. The sample size was calculated using the formula for the calculation of samples from the cross-sectional study. At 95% Confidence interval, Z equals 1.96, and 0.05 margins of error was used. P value of ≤ 0.05 was considered significant. The sample size was calculated to be 80. About 50 students volunteered to participate in the study and the same sample was analyzed to see the effectiveness in the implementation of e-learning module.

Results

The students in the study group have observed that the course of the schedule had been framed appropriately (64%) and clearly defined (62%) in e-learning platform compared to conventional methods (18% & 30% respectively). There were complaints by majority of the students (62%) with overcrowding in the learning sessions by the conventional methods which significantly affected their learning process. The majority of the students (54%) gave positive response using e-learning towards course outline across the other courses in comparison to conventional methods (20%) (Table I).

The course objectives were clearly defined, represented well and matched the program expectations in the e-learning module but did not have any significant impact on learning behavior over the students by both the methods. (Table II).

e-learning has been accepted very well by the students (48%) and they found it to be a better learning resource (44%). Most were of opinion that e-learning can be used as complementary to conventional methods. About 25% of students find both e-leaning and conventional methods as convenient in learning. (Table III)

The assessment methods were clearly defined, familiar and students could complete the tasks without any help fulfilling the expected outcomes in both the methods. But, in e-learning students could submit the assigned tasks conveniently (40%) in comparison to conventional methods (18%). (Table IV).

Table I:Section A: Schedule of the Course and course objectives								
Q. No.	**Questionnaire**	**Module**	**Strongly Agree (%)**	**Agree (%)**	**Neutral (%)**	**Disagree (%)**	**Strongly Disagree (%)**	**P-Value**
1	The Course schedule has been framed appropriately	IBL	38	26	14	12	10	0.000*
		MSS	8	10	24	20	38	
2	The course outline is appropriate across the other courses	IBL	30	24	26	6	14	0.008
		MSS	10	10	34	10	36	
3	The course schedule is clearly defined	IBL	42	20	22	6	10	0.003*
		MSS	12	18	24	10	36	
4	The course schedule is congested	IBL	10	12	26	18	34	0.002*
		MSS	32	30	12	10	16	
5	I am able to follow the schedule on Blackboard	IBL	40	12	18	18	12	0.004*
		MSS	14	24	14	12	36	

Table II: Section B: Course Objectives								
Q. No.	**Questionnaire**	**Module**	**Strongly Agree (%)**	**Agree (%)**	**Neutral (%)**	**Disagree (%)**	**Strongly Disagree (%)**	**P-Value**
1	The course objectives are clearly defined	IBL	34	20	26	8	12	0.030
		MSS	14	12	30	10	34	
2	The course objectives are informed before the start of the course	IBL	28	26	8	20	18	0.004*
		MSS	12	16	26	8	38	
3	The course objectives match the expected outcomes of the course	IBL	34	14	28	10	14	0.012
		MSS	12	18	18	12	40	
4	I am able to follow the objectives in each lecture across the course	IBL	32	16	26	18	8	0.001*
		MSS	10	18	22	10	40	
5	All the course objectives are covered in the virtual lectures using blackboard	IBL	34	14	26	18	8	0.000*
		MSS	8	6	18	14	54	
6	All the teaching faculty defines and follow the objectives of concerned lectures	IBL	32	16	28	8	16	0.011
		MSS	10%	10%	26%	10%	44%	

Table III: Section C: Teaching Methods								
Q. No.	**Questionnaire**	**Module**	**Strongly Agree (%)**	**Agree (%)**	**Neutral (%)**	**Disagree (%)**	**Strongly Disagree (%)**	**P-Value**
1	Blackboard teaching is appropriate for my leaning skills	IBL	32	16	22	16	14	0.500
		MSS	28	24	18	8	22	
2	Virtual lectures are excellent teaching resource compared to traditional teaching methods	IBL	38	6	28	8	20	0.424
		MSS	34	16	18	12	20	
3	Virtual lectures should be taken as complementary to the traditional teaching methods	IBL	36	16	20	14	14	0.692
		MSS	30	10	28	12	20	
4	Blackboard teaching should be used for the entire course rather than complementary	IBL	32	18	30	6	14	0.162
		MSS	28	12	18	18	24	
5	All the course objectives were followed in the teaching methods using blackboard	IBL	32	22	22	12	12	0.015
		MSS	16	14	14	16	40	

Table IV: Section D: Assessment Methods								
	Questionnaire	Module	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	
1	The assessment methods of the courses are clearly defined	IBL	30	20	14	14	22	0.475
		MSS	20	18	14	10	38	
2	I am familiar with the assessment methods used on blackboard	IBL	28	16	16	20	20	0.182
		MSS	14	12	18	16	40	
3	The coordinator has informed me about the expected outcomes from courses	IBL	28	8	26	16	22	0.258
		MSS	18	14	16	14	38	
4	I am able to complete the assessment tasks without any help	IBL	32	8	22	18	20	0.072
		MSS	12	6	22	18	42	
5	I am able to submit the assessment tasks on time conveniently on blackboard	IBL	32	8	20	20	20	0.068
		MSS	14	4	20	18	44	

Table V: Section E: Feedback and Complaints									
Q.No.	Questionnaire	Module	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Not Applicable (%)	P-Value
1	The internet speed was sufficient to follow virtual lectures	IBL	10	32	22	18	18	0	0.000*
		MSS	0	13	23	21	44	22	
2	I am able to upload the assignments at ease on the blackboard	IBL	32	22	16	16	14	0	0.000*
		MSS	0	3	24	18	55	24	
3	I am able to follow the discussion boards	IBL	34	16	24	16	10	0	0.000*
		MSS	0	8	23	18	51	11	
4	The tools provided in the blackboard are student friendly for use	IBL	28	18	26	16	12	0	0.000*
		MSS	0	3	26	15	56	22	
5	I am satisfied from the faculty participation in completion of their teaching activities	IBL	34	16	18	18	14	0	0.000*
		MSS	2	12	21	16	49	7	
6	The lectures were conducted in scheduled hours	IBL	34	16	24	16	10	0	0.000*
		MSS	5	10	26	12	48	8	
7	I am satisfied from the faculty participation in completion of their teaching activities	IBL	28	12	34	14	12	0	0.000*
		MSS	4	13	24	11	47	5	
8	I am able to clarify my doubts among the peers	IBL	28	16	26	18	12	0	0.000*
		MSS	7	7	33	11	42	5	
9	Overall, I am satisfied in the implementation of the course	IBL	32	14	24	12	18	0	0.000*
		MSS	2	14	16	14	53	7	

The students also had issues and concerns using e-learning pertaining to internet speed, uploading of assignments, follow-up of topics and active involvement of faculty which significantly affected their learning in comparison to conventional methods. The major advantage in conventional methods were due to peer interaction, student-faculty interaction and active participation of faculty with feedback for improvement. (Table V)

Discussion

Following the outbreak of the Covid-19 pandemic, there has been renewed interest on the role and utility of virtual and digital learning across the whole world. E-learning has appeared as a unique learning approach with major concern in medical education continuity during the pandemic. [6]A web-based study was done using a standardized, validated, electronic, self-administered, Google Form data collection sheet towards effectiveness of the e-learning tool. We also investigated significant challenges faced by the students during this unique learning experience.

In our study, we found that the e-learning was acceptable for the young generation as effective learning tool. Students' rating e-learning as not a bad experience, and their rating it as better or similar to on-campus learning found that younger students had a higher level of e-learning acceptance. A study by Toe, et al. also reported that age was negatively associated with all facets. [7]One of the studies among Polish students also showed better acceptance of e-learning as learning resource. [8]But these was completely contradictory to another study.[9]

It has been seen in providing equal access to education, guaranteeing equity and justice,ensuring timely delivery of need-based educational contents, engaging the learners through acarefully planned pedagogical support with the latest online learning technologies.[10] Gaining a better understanding of medical students' acceptance of e-learning can improve our knowledge of their computer-related behaviours and obstacles. [7] The results from a recent meta-analysis, 2019, found that none of the sixteen studies included in their analysis reported that online learning was less effective than offline methods. [11]

In our study, the students had concerns using e-learning pertaining to internet speed, uploading of assignments, follow-up of topics and active involvement of faculty which significantly affected their learning in comparison to conventional methods. Similar findings with varied reasons including the advantage of face-to-face interactivity, immediate feedback and sense of community amongst many other were found. One reason could also be related to difficulty inteaching skills, as in practical classes.[10]Similar findings were found in other studies too. [12]

In our study, students expressed that the major advantage in conventional methods were due to peer interaction, student-faculty interaction and active participation of faculty with feedback for improvement. Similar findings were observed in a study done in Saudi Arabian university and Sudan. [12, 14] One of the major driving forces for accomplishment of objectives and utmost satisfaction of participants of online classes is interactivity and collaborative learning.[15]

Limitations of the study:

Only 50 students volunteered for participation in the study. We could evaluate only two modules due to technical issues and time constraints. Evaluation across all the modules would give more beneficial outcome towards implementation and productive use of E-learning in the curricular activities.

Conclusion

E-learning can be used as complementary to conventional methods with better planning as using both in a timely fashion and as per the needs of the students have an upper hand in long term teaching concepts with peer and faculty interaction and feedback for improvement. Proper implementation of curricular activities holds the key for success in fulfilling the expected outcomes by either of the methods.

Conflict of Interest –Nil

Source of Funding- Self Funding

Ethical Clearance: EC is obtained from institutional ethical clearance committee.

References

1. Abbasi, S., Ayoob, T., Malik, A., Memon, S.I., Perceptions of students regarding E-learning during Covid-19 at a private medical college. Pakistan J. Med. Sci. 2020;36 (COVID19-S4), 57–61.
2. Almaghaslah, D., Ghazwani, M., Alsayari, A., Khaled, A. Pharmacy students' perceptions towards online learning in a Saudi Pharmacy School. Saudi Pharm. J. 2018; 26 (5), 617–21.
3. Alqurshi, A. Investigating the impact of COVID-19 lockdown on pharmaceutical education in Saudi Arabia–A call for a remote teaching contingency strategy. Saudi Pharm. J. 2020; 28 (9): 1075–83.
4. Alsuraihi, A.K., Almaqati, A.S., Abughanim, S.A., Jastaniah, N.A. Use of social media in education among medical students in Saudi Arabia. Korean J. Med. Ed. 2016; 28 (4), 343.
5. Alavudeen SS, Easwaran V, Mir JI, Shahrani SM, Aseeri AA, Khan NA et al. The influence of COVID-19 related psychological and demographic variables on the effectiveness of e-learning among health care students in the southern region of Saudi Arabia. Saudi Pharmaceutical Journal, 2021; 29(7):775-780. Available at: https://doi.org/10.1016/j.jsps.2021.05.009
6. Ibrahim NK, Raddadia RA, Al-Darmasia M, Al-Ghamdia A , Gaddourya M , Al-Bara HM. Medical students' acceptance and perceptions of e-learning duringthe Covid-19 closure time in King Abdulaziz University, Jeddah. Journal of Infection and Public Health 14 (2021) 17–23.
7. Teo T. Development and validation of the E-learning acceptance measure (ElAM). Internet High Educ 2010;13(3):148–52.
8. Czek MB, Zaganczyk-Baczek M, Szpringer M, Jaroszynski A and zakowska-Kapłon BW, Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish medical students, Medicine (2021) 100:7.
9. Chen E, Kaczmarek L and Ohyama H. Student perceptions of distance learning strategies during COVID-19. J Dent Educ. 2021;85(Suppl. 1):1190–1191.
10. Bordoloi R, Das P and Das K. Perception towards online/blended learning at the time of Covid-19 pandemic: academic analytics in the Indian context, Asian Association of Open Universities Journal 2021; Vol. 16(1): 41-60.
11. Pei L, Wu H. Does online learning work better than offline learning inundergraduate medical education? A systematic review and meta-analysis. Med Educ Online 2019;24(1):1666538, http://dx.doi.org/10.1080/10872981.2019.1666538 . Epub 2019/09/19; PubMed PMID: 31526248; PubMed CentralPMCID: PMCPMC6758693.
12. Sawarkar G, Sawarkar P, Kuchewar V. Ayurveda students' perception toward online learning during the COVID-19 pandemic. J Edu Health Promot 2020; 9:342.
13. Khalil R, Mansour AE, Fadda WA, Almisnid K, Aldamegh M, Al-Nafeesah A et al. The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: a qualitative study exploring medical students' perspectives, BMC Medical Education, (2020) 20:285.
14. Gismalla MD, Mohamed MS, Ibrahim OSO, Elhassan MMA and Mohamed MN. Medical students' perception towards E-learning during COVID 19 pandemic in a high burden developing country, BMC Medical Education, (2021) 21:377.
15. Johnson, R. D., Hornik, S., & Salas, E. An empirical examination of factors contributing to the creation of successful e-learning environments. International Journal of Human-Computer Studies; 2008; 66(5), 356–369.