COMPARISON OF E-LEARNING AND CONVENTIONAL BED SIDE TEACHING FOR MEDICAL STUDENTS IN OPHTHALMOLOGY

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ABSTRACT

BACKGROUND

E-learning is a system of learning where the content is delivered electronically. E-learning involves using computers or IT for delivery of at least some part of the content.

The objectives of the study were-

1. To assess the difference in knowledge of medical students after conventional bed side teaching vs e learning method of ophthalmic case demonstration.
2. To assess the differences in perception of medical students about two teaching methodologies.

MATERIALS AND METHODS

This study was a comparative study conducted among 60 seventh semester MBBS students posted in Dept. of Ophthalmology at Jubilee Mission Medical College for a period of 2 months (November 2017 to December 2017). They were divided into group A and group B based on their roll numbers. For group A, 6 different ophthalmic cases were demonstrated by conventional bed side method of teaching and for group B, same cases were recorded and demonstrated as photos and videos. They were evaluated using OSCE and questionnaires.

RESULTS

In our study, after evaluating the OSCE scores using independent two sample- t test / Mann Whitney test, students who attended e-learning had a mean score of 43.23 i.e. 72.05% and conventional learning had a mean score of 42.15 i.e. 70.25% which is significant statistically (p value > 0.005).

CONCLUSION

After evaluation of OSCE marks, students who were demonstrated with e-learning method fared better than conventional learning methods. Statistical analysis showed a significant P value. Hence it can be concluded that e-learning method is preferably better than conventional learning.

KEYWORDS

E-learning, Conventional Learning, Comparison, Qualitative, Quantitative, Bed side teaching.

HOW TO CITE THIS ARTICLE: Kakkanatt CVA, Kuriakose A, Sasidharan A, et al. Comparison of e-learning and conventional bed side teaching for medical students in ophthalmology. J. Evid. Based Med. Healthc. 2018; 5(31), 2268-2274. DOI: 10.18410/jebmh/2018/470

BACKGROUND

E-learning or electronic learning is a system of learning where the content is delivered electronically. It can be a learning based on internet or a learning based on virtual learning environment. The basic of e-learning is that it involves using computer or IT for delivery of at least some part of the content and may involve some degree of simulation of reality.[1]

Financial or Other, Competing Interest: None.
Submission 04-07-2018, Peer Review 07-07-2018,
Acceptance 22-07-2018, Published 24-07-2018.
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DOI: 10.18410/jebmh/2018/470

E-learning is the latest entrant in teaching learning (T-L) methodology. The integration of learner with the material to construct the learner's knowledge is the key for the successful e-learning. Skilful integration of media with learning is required to attain the desired result in e-learning. The entry of electronic resources, easy and quick access to book and journals helped for an effective e-learning. The e-resources act on a platform for rapid access for multiple users at the same time and thus save time also.[2]

The easy availability of internet as dominant tool in medical education has influenced the study pattern of medical students. Medical students can exert more control over their learning by flexibility over content and pace. E - learning models help the education to evaluate competencies (CBME) objectively by online assessment so that students can receive feedback for further improvement.[3]

Instructional material includes, power point presentation slide, tutorials, case-based learning, web and cyber media links. Multimedia like text, graphic, animation, audio, video are used and delivered by computer.

Conventional learning is followed for long decades as our way of education in India. In ophthalmology, conventional (traditional) learning is by communicating with the patients, establishing rapport, taking their history, examination of their eyes after obtaining consent from the patient with a torch light. The disadvantage is inconvenience to the patient, all students are not able to appreciate the signs or findings demonstrated in the same way. In e-learning students will be able to understand the findings better as images register easily in their mind. Disadvantage is that they will not be able to master the art of communication skill and how to establish rapport with the patient.

Objectives

- To assess the difference in knowledge of medical students after conventional bed side teaching vs. e learning method of ophthalmic case demonstration
- To assess the differences in perception of medical students about two teaching methodologies

MATERIALS AND METHODS

Study Design

Comparative study.

Study Setting

Department of Ophthalmology, Jubilee Mission Medical College, Thrissur.

Sample Size

60 seventh semester MBBS students posted in ophthalmology.

Inclusion Criteria

Students posted for training in ophthalmology who are willing to participate in the study.

Exclusion Criteria

a) Students who are not willing to participate in the study.
b) Students who are absent on the day of demonstration or evaluation.

We got Institutional Ethics Committee cleared from Jubilee Mission Medical College and Research Institute with reference number of 50/17/IEC/JMMC&RI approved on 01/11/2017.

Seventh semester MBBS students posted for ophthalmology training in November - December (30 x 2 batches = 60 students) based on consecutive sampling were included in this study. They were divided into two groups based on their roll numbers - Group A (15 x 2 batches = 30 students) and Group B (15 x 2 batches = 30 students).

For group A, 6 different ophthalmic cases were demonstrated by conventional bed side method of teaching. As part of e- learning same 6 cases were recorded by digital fundus camera or by slit lamp photography as photos and videos which were demonstrated to group B .This group A and B was assessed separately at the end of their case presentation by OSCE - 6 different stations based on the 6 cases demonstrated (Quantitative assessment) and 2 questionnaires to assess their preference, opinion and acceptance (Qualitative assessment) .The marks obtained were analysed statistically.

Before the end of one month posting after demonstrating and assessing cases for 2 weeks, Group A was given e- teaching and group B was subjected to conventional teaching in order to avoid any mode of discrepancy in education provided to the medical students. After the completion of their posting, a feedback was taken from the students to get their opinion regarding the new e-learning methodology of teaching. The reliability of questionnaires was tested using Chronbach Alpha (value obtained is 0.740, value >0.7 is reliable). The data's obtained were statistically analysed and tested using independent two sample – t test / Mann Whitney test.

The following were the common cases attending the ophthalmology OPD and is important for the medical students in the examination point of view, which was demonstrated to the students.

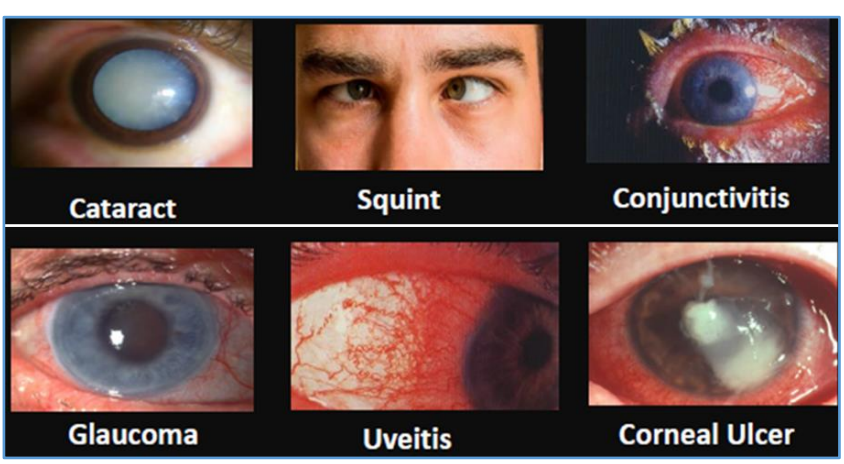

Image 1. (a) Cataract (b) Squint (c) Conjunctivitis (d) Glaucoma (e) Uveitis (f) Corneal Ulcer

RESULTS

Data was collected from 60 students after categorising them into 2 groups of 30 each. Data obtained from 60 students was coded and entered in Microsoft excel sheet and analysed using SPSS vs. 20.

Type of Learning	N	Score (Out of 60)		p Value
		Mean	SD	
E-learning	30	43.23	1.51	0.005
Conventional learning	30	42.15	1.38	

Table 1. Score Comparison between Conventional and E- Learning Method

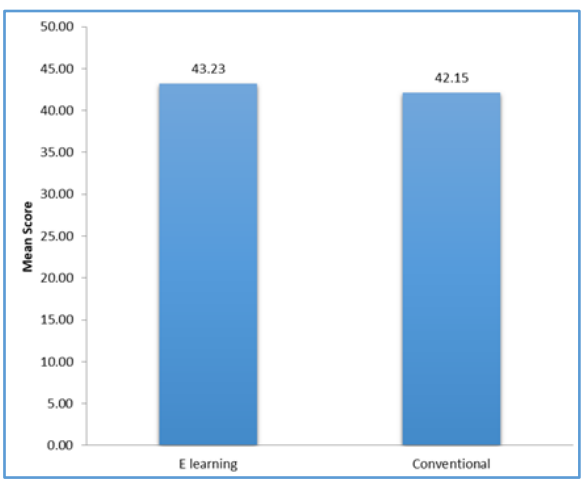

Figure 1. Score Comparison between Conventional and e-Learning Method (OSCE- out of 60 marks)

Students who attended e-learning had a mean score of 43.23 i.e. 72.05% and conventional learning had a mean score of 42.15 i.e. 70.25% which is significant statistically (p value > 0.005).

Question 1	e-learning	Conventional
Very Good	10.0	10.0
Good	23.3	20.0
Acceptable	56.7	70.0
Poor	10.0	0.0

Table 2. (Question 1) Attention Span of Student

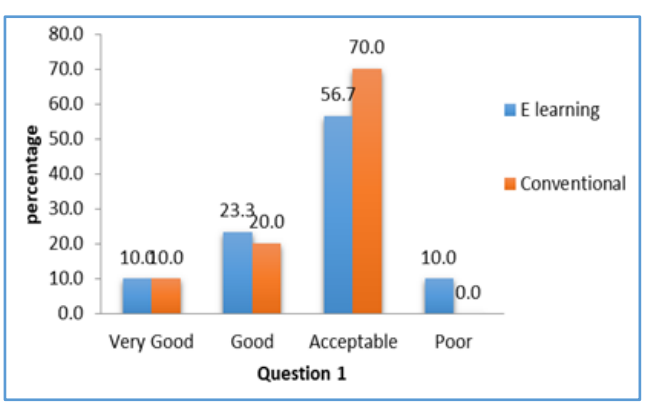

Figure 2. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 2	e-learning	Conventional
Very Good	3.3	16.7
Good	56.7	50.0
Acceptable	30.0	30.0
Poor	10.0	3.3

Table 3. (Question 2) In Understanding the Sequential Steps of Ocular Examination

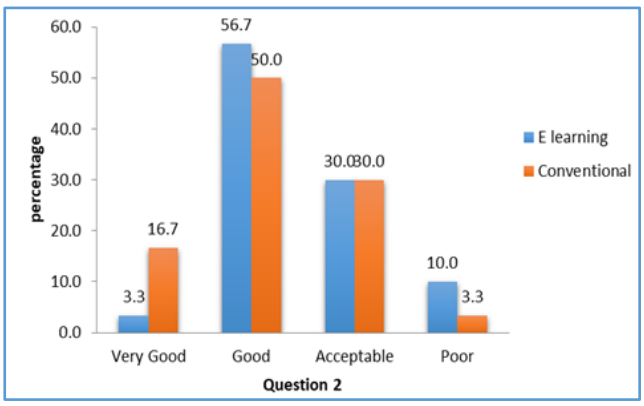

Figure 3. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 3	e-learning	Conventional
Very Good	13.3	10.0
Good	23.3	36.7
Acceptable	53.3	46.7
Poor	10.0	6.7

Table 4. (Question 3) Comfort of Student and Patient

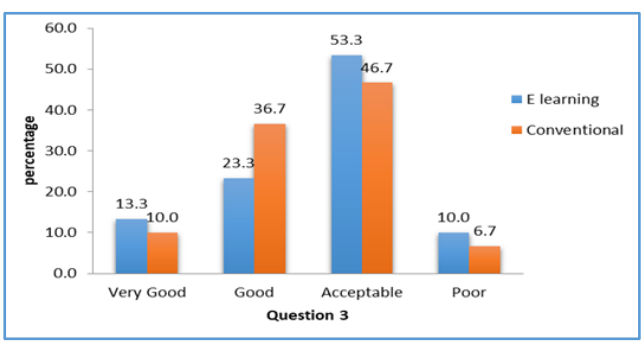

Figure 4. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 4	e-learning	Conventional
Very Good	16.7	3.3
Good	6.7	23.3
Acceptable	66.7	66.7
Poor	10.0	6.7

Table 5. (Question 4) Co-operation of Patient

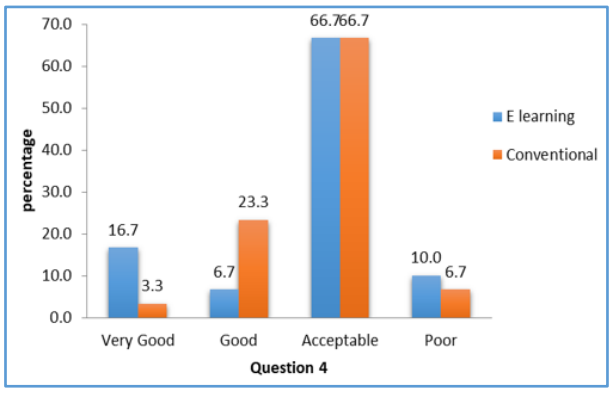

Figure 5. Comparison between Conventional and e Learning Method from Questionnaire in Percentage

Question 5	e-learning	Conventional
Very Good	16.7	6.7
Good	13.3	50.0
Acceptable	56.7	30.0
Poor	13.3	13.3

Table 6. (Question 5) In Generating Interest in the Subject

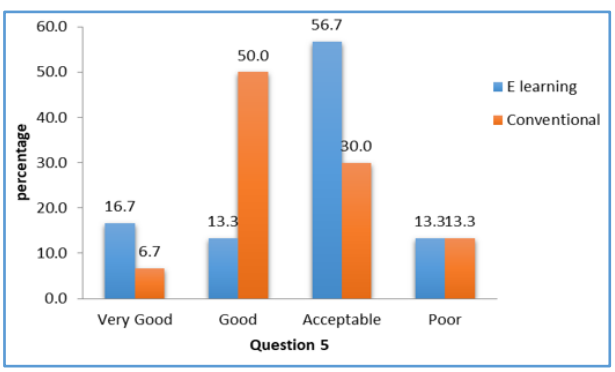

Figure 6. Comparison between Conventional and e-Learning method from Questionnaire in Percentage

Question 6	e-learning	Conventional
Very Good	6.7	0.0
Good	13.3	40.0
Acceptable	36.7	36.7
Poor	33.3	16.7
Very poor	10.0	6.7

Table 7. (Question 6) Interactive Discussion

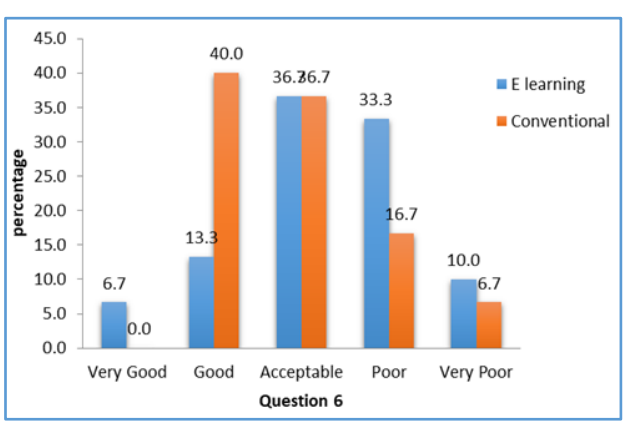

Figure 7. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 7	e-learning	Conventional
Very Good	26.7	10.0
Good	40.0	53.3
Acceptable	13.3	23.3
Poor	20.0	13.3

Table 8. (Question 7) Understanding of Clinical Findings

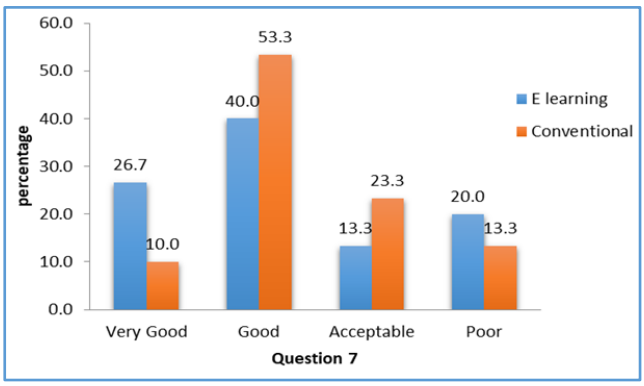

Figure 8. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 8	e-learning	Conventional
Very Good	6.7	0.0
Good	40.0	36.7
Acceptable	46.7	53.3
Poor	6.7	10.0

Table 9. (Question 8) To Recommend as the Preferred Option for Future Teaching

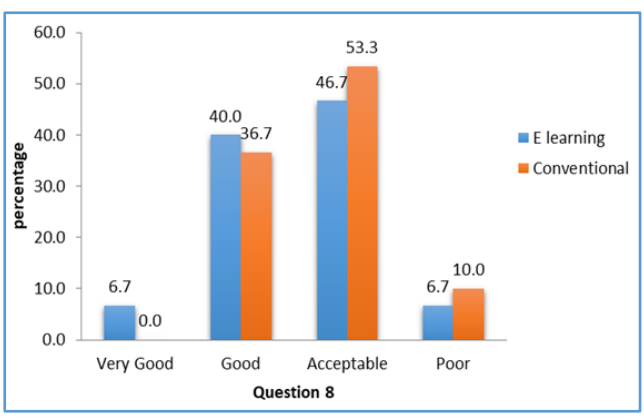

Figure 9. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 9	e-learning	Conventional
Very Good	0.0	10.0
Good	16.7	13.3
Acceptable	70.0	66.7
Poor	13.3	10.0

Table 10. (Question 9) To Recommend as the Preferred Option n for Other Subjects

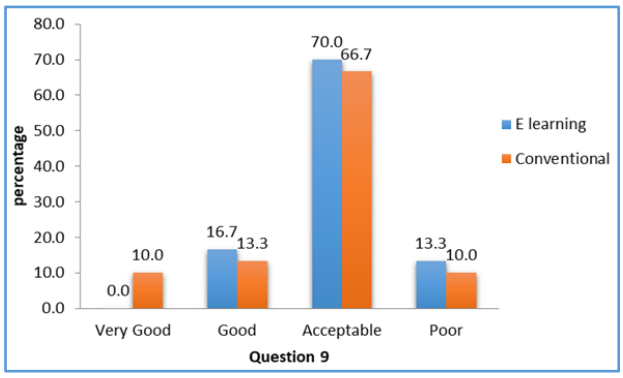

Figure 10. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Question 10	e-learning	Conventional
Very Good	0.0	10.0
Good	23.3	23.3
Acceptable	66.7	60.0
Poor	10.0	6.7

Table 11. (Question 10) Overall How do You Assess the Teaching Method

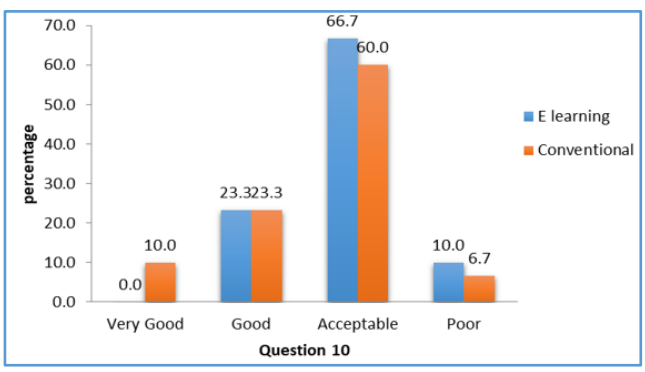

Figure 11. Comparison between Conventional and e-Learning Method from Questionnaire in Percentage

Feedback	Agree	Disagree
Q1	83.3	16.7
Q2	88.3	11.7
Q3	76.7	23.3
Q4	68.3	31.7
Q5	66.7	33.3
Q6	51.7	48.3
Q7	51.7	48.3

Table 12. Feedback Questionnaire

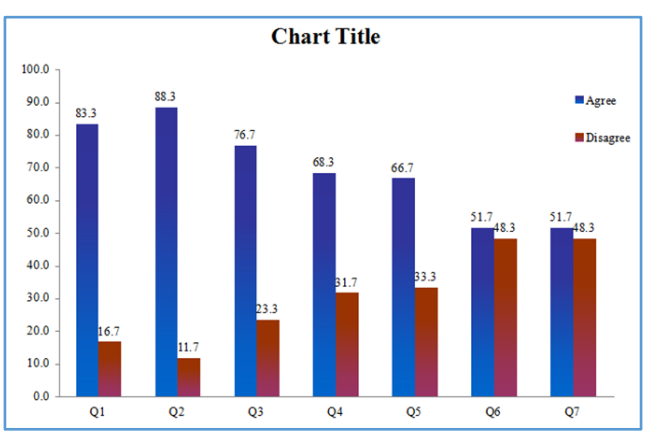

Figure 12. Feedback Questionnaire Regarding their Opinion on E- learning in Percentage (60 students)

Analysis

Numerical variables were presented as mean and standard deviation and categorical variables were expressed as frequency and percentage. The mean differences of OSCE score between two groups, were tested using independent two sample t - test / Mann Whitney U test.

DISCUSSION

E-learning is the use of technologies for the purpose of education. It serves to store the instructional material of diverse forms such as print, pictures, animations and videos electronically.

This study was a comparative study conducted among 60 seventh semester MBBS students posted in Dept. of Ophthalmology at Jubilee Mission Medical College for a period of 2 months during November 2017 to December 2017. They were divided into two groups (group A and group B) based on their roll numbers. For group A, 6 different ophthalmic cases were demonstrated by conventional bed side method of teaching. And for group B, same cases were recorded and demonstrated by digital fundus camera or by slit lamp photography as photos and videos. This group A and B was assessed separately at the end of their case presentation by OSCE.

Seema Dutt Bandhu and Swati Raje et al, in their study concluded that e- learning is well accepted among MBBS students. About 70% of students desired to have e - learning as their medium of instruction for better scores. In our study, majority of students fared well by e-learning method of teaching (mean score of 43.23 out of 60) than conventional method of teaching (mean score of 42.15 out of 60). P value is also significant (P >0.005).[4]

Josie Naomi Iyeyasu et al concluded in this study the effectiveness of e learning method within a graduate medical education group and it has improved the participation of the students. In our study, we have inferred that 70.8 % students preferred e-learning than conventional learning based on the qualitative questionnaire.[5]

Nahid Zarif Sanaiey et al in his study showed that blended learning (e-learning and traditional way of learning) is more effective approach than E leaning alone.[6]

Kristine Rasmussen et al concluded that offline e-learning is equivalent and possibly superior to traditional learning regarding knowledge, skills, attitudes and satisfaction which is similar to result obtained in this study.[7]

Fariborz Moazami et al in his study concluded that virtual learning was more effective than traditional learning.[8] Maryam Fooladvand et al in their study concluded that virtual approach of education must be introduced in schools.[9] Armin Ariana et al concluded that the use of e-learning tools such as virtual microscopy and interactive online resources for delivering pathology instruction can be an effective supplement for developing dental students' competence, confidence, and satisfaction.[10] All these studies have similar results.

CONCLUSION

The detailed analysis of our study "Comparison of e-Learning and Conventional Bed Side Teaching for Medical Students in Ophthalmology" which was conducted among seventh semester MBBS students posted for ophthalmology training in November - December 2017 was compared and reviewed with reported statistics and literature.

After evaluation of OSCE marks, students who were demonstrated with e-learning method fared better than conventional learning methods. Statistical analysis showed a significant P value.

As part of qualitative assessment, questionnaires were evaluated which revealed that students preferred e-learning method to conventional learning methods. Based on feedback questionnaire, majority of students wanted e-learning method to be continued in ophthalmology and to be incorporated to other subjects.

Hence it can be concluded that e-learning method is preferably better than conventional learning method.

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ANNEXURE IA & IB

The reliability of feedback questionnaire was tested using Cronbach 'Alpha. (Value obtained is 0.740, value >0.7 is reliable).

QUESTIONNAIRE 1**: E- LEARNING METHOD**
(PLEASE TICK YOUR RESPONSE)

Sl. no.	QUESTIONS	Very Good	Good	Acceptable	Poor	Very Poor
1	Attention span of student					
2	In understanding the sequential steps of ocular examination					
3	Comfort of student and patient					
4	Co-operation of patient					
5	In generating interest in the subject					
6	Interactive discussion					
7	Understanding of clinical findings					
8	To recommend as the preferred option for future teaching					
9	To recommend as the preferred option for other subjects					
10	Overall how do you assess the teaching method					

QUESTIONNAIRE 2**: CONVENTIONAL METHOD**
(PLEASE TICK YOUR RESPONSE)

Sl. no.	Questions	Very Good	Good	Acceptable	Poor	Very Poor
1	Attention span of student					
2	In understanding the sequential steps of ocular examination					
3	Comfort of student and patient					
4	Co-operation of patient					
5	In generating interest in the subject					
6	Interactive discussion					
7	Understanding of clinical findings					
8	To recommend as the preferred option for future teaching					
9	To recommend as the preferred option for other subjects					
10	Overall how do you assess the teaching method					

ANNEXURE II
FEEDBACK QUESTIONNAIRE ABOUT E- LEARNING

Sl. no.	Questions	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
1.	Is E learning suitable for Ophthalmic case presentation					
2.	Will it motivate you in learning process					
3.	Does it increase your self confidence					
4.	Does it reduce your stress level during learning					
5.	Are you able to perform better in exams or OSCE					
6.	Do you recommend it to other subjects					
7.	Do you think it should be continued					