

**PREFERENCE OF TEACHING AND LEARNING METHODS IN A
MEDICAL SCHOOL OF INDIA****PREETY LACHHIRAMKA^{*1}, SUJAY PATIL² AND PRAMILA YADAV³**¹Associate Professor in Department of Pharmacology, D Y Patil University School of Medicine, Nerul, Navi Mumbai, Maharashtra, India.²Resident in Department of Pharmacology, D Y Patil University School of Medicine, Nerul, Navi Mumbai, Maharashtra, India.³Professor in Department of Pharmacology, D Y Patil University School of Medicine, Nerul, Navi Mumbai, Maharashtra, India.**ABSTRACT**

Teaching and learning are self-evolving process. There is a strong correlation between the methods used in transforming information by the lecturer's and assimilation of knowledge of the students. Purpose of this study is to assess the teaching and learning expectations of the medical students from the lecturer and the institution. A questionnaire based study was carried out at DYPUSM, Navi Mumbai. MBBS students studying in Phase 2 were enrolled in study after taking informed consent. 100 students were selected randomly out of 150 Phase 2 medical students from Batch 2015 to answer the questionnaire study. Study was conducted on 20 October 2015. The main teaching and learning methods for pre-clinical phase includes lecture, tutorial, practical, problem based learning (PBL) and early clinical exposure (ECE). Validated and pretested questionnaire was obtained after taking permission from authors who carried out a similar study in Malaysia. Questionnaire was divided into 7 sections. Data was analyzed using appropriate statistical tests. This study showed that 37 (37 %) out of 100 respondents chose a lecture as most preferred teaching and learning method. Other methods favored are problem-based learning 20 (20 %), early clinical exposure 1 (18 %), practical 10 (10 %), tutorial 8 (8 %) and computer learning activity 7 (7 %). Most preferred methods were lecture and problem-based learning to acquire knowledge in a medical school. Final outcome of this study would definitely help medical universities in improving learning and teaching methodologies which would contribute towards development of knowledgeable and highly skilled medical graduates.

KEYWORDS : lecture, problem-based learning, teaching, knowledge.**PREETY LACHHIRAMKA**Associate Professor, Department of Pharmacology, D Y Patil University School of Medicine,
Nerul, Navi Mumbai, Maharashtra, India.

INTRODUCTION

Learning is possible with or without teaching. A teacher teaching without understanding or learning is just talking. A focused approach should be carried out on improving learning rather than teaching.¹ Tremendous pressure is exerted on teachers, clinicians and investigators by medical institutions with the never ending demands of creativity and effectiveness. The pressure is derived from curriculum reform, competition in the healthcare market and limitation of available resources to support research. With these changes, it is imperative that faculty members upgrade new skills, knowledge and teaching abilities. Faculty members need to master these new skills in order to promote academic excellence.² Major hurdles and different challenges are being faced by faculty members in teaching tomorrow's physicians.³ A recent shift is needed towards competency-based curriculum emphasizing the learning outcome, not the process, of education.⁴ Teaching is a process which is considered as 'ever evolving' especially in medical schools across world. Continuous modernization of teaching techniques is consequently needed.⁵ Medical school teachers are under pressure to deliver enormous amount of knowledge in very tight and narrow schedules and students need to retain, remember and interpret it.^{5,6} Day to day innovations in medical education has led to emergence of transformative learning in which emphasis is on improvement of professional competencies such as clinical/practical skills, leadership, professionalism and ethical practice rather than focus on knowledge only.⁷ In early centuries, context expertise teachers were assumed to be teacher expertise as well. Academic leaves, sabbaticals, research funding and travel to professional meetings were considered to be primary mechanisms for enhanced and innovative teaching techniques.² Most faculty members gain knowledge of teaching not by learning but from observing the way being taught.⁸ Experience alone can act as a slow and painful mediator to gain knowledge about teaching. Faculty development programs are being carried out in every medical college to reduce the time required to learn teaching and provide guidance for improvement in teaching. Conceptualized faculty development in medical education will help improve teachers in acquiring new instructional skills, better curriculum design and a well-organized environment for education.⁹ Variety of approaches are being taken to successfully improve teaching in succession with changing theories of learning.¹⁰ For the purpose of improving instruction, teaching feedback forms rated by students were institutionally collected. Feedback forms act as indicators to instructors on automatic improvement of their skilled knowledge.¹¹ Workshops and consultations have been the emerging mainstays of teaching improvement programs which couple skill training activities with discussions and help understand faculty members to develop a conceptual understanding of learning principles underlying teaching behaviors.¹² Adapting new teaching styles is only possible for teachers if they know

students way of learning.¹³ Learning styles have been defined as individuals preferred method, in which he gathers, process, interprets, organizes and analyses information.¹⁴ Teacher-centered to student-centered learning is a current global trend to reform medical curriculum. Medical students with the fact being adults have already developed their unique way of learning. So it is very essential for the medical educators to appreciate student's way of learning and lay down instructions accordingly.¹⁵ A sensory model naming VARK model is being developed by many educational scholars with objective to compile information. Abbreviation for VARK is Visual (V), Auditory (A), Read/Write (R) and kinaesthetic (K) sensory modalities. Visual learners are known to process information best if they see it. Auditory learners process best when they hear it. Read/Write learners have habit to read and write. Kinaesthetic learners are the ones which acquire knowledge and information through experience and practice.¹⁶ Coin has two sides, similarly teaching and learning are the two sides of same coin. Quality of teaching always depends on the amount of students learned. Currently, the MBBS Programme in D Y Patil University School of Medicine (DYPUSM) is held over a span of five and half years inclusive of internship. It has 3 phases. Phase 1 is of 1 year, Phase 2 of one and half year. Phase 3 is split in two parts – third minor and third major, each of 1 year followed by 1 year of internship. Phase 1 students are integrated to learn and understand human anatomy, physiology and biochemistry. Phase 2 is one of crucial time when students enter the clinical arena of postings. The idea behind this is early clinical exposure along with study curriculum. Medical quizzes, conferences and workshops are additional learning methods which are carried out at the university. The aim of this study has been to assess learning and teaching expectations of the Phase 2 medical students enrolled at DYPUSM. As Phase 2 being a stage where students start gaining clinical knowledge along with non-clinical subjects, we targeted such students in our study. Rationale of this study is to make suggestions and improve learning/teaching methods with an incentive that such studies would improve quality and efficiency of teaching by the faculty. The results of this study would definitely help every medical university to take valuable actions by faculty to improve student's credibility as future doctors.

MATERIALS & METHODS

This is a questionnaire based cross-sectional study which was conducted among Phase 2 students in DYPUSM, Nerul Navi Mumbai, India. Total study population was 100 out of 150 Phase 2 medical students. Students were selected randomly from Phase 2 medical batch of year 2015. The study was done on 20 October 2015 before a scheduled lecture. Data was collected by Associate Professor and Junior Resident of Dept. of Pharmacology. An English language Questionnaire was developed through extensive review of literature. Questionnaire was pretested and a validated one. This would help to obtain

information regarding student's problems in learning and most preferred learning and teaching methodologies favored among medical students. Questionnaire has been in divided in 6 sections in order to achieve objectives of study. Data obtained was compiled and analyzed using appropriate statistical tests. P values were calculated from Z score using a calculator. The study was first approved by Ethics Committee of the DYPUSM with Registration number ECR/195/Inst/MH/2013 and later conducted. Prior written informed consent was taken before participation in study.

RESULTS

Total respondents were 100 medical students of Phase 2. Out of 100, male participants were 43 (43 %) and girl participants were 57 (57 %). Majority 37 (37%) of study population are of opinion that lecture is the most preferred method of teaching. Other methods opted by students were problem based learning 20 (20 %), early clinical exposure 18 (18 %), practical 10 (10 %), tutorial 9 (9 %) and computer activity learning 7 (7 %). (Figure 1)

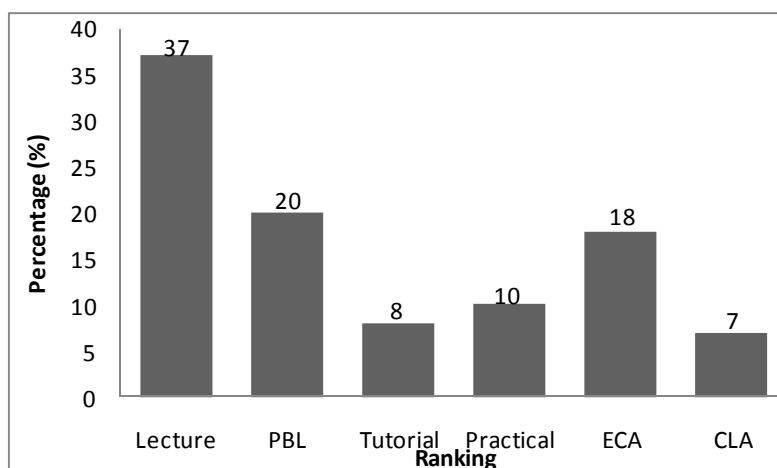


Figure 1
Preference of students of Teaching and Learning methods.

No significant difference was found in gender wise preference of problem based learning ($p = 0.218$), lecture ($p = 0.226$), tutorial ($p = 0.423$), practical ($p = 0.429$), early clinical exposure ($p = 0.568$), computer learning activity ($p = 0.952$) (Table 1). Medical students have shown more importance according to Table 2, when they know the topic is clinically important 63 (63 %) rather than creativity presented by the lecturer 37 (37%). Table

3 highlights issues on problems encountered during teaching and learning session. Main problems encountered during this session were related to lecture, practical and self-study. Regarding lecture class, respondents are of opinion that lecturers teaching method is non-interactive [64 (64 %)], the topic itself is hard to understand [26 (26 %)] and rest feel student's attitude (sleep during class, not focus) [10 (10 %)]

Table 1
Comparison between Gender Ranking of Teaching and Learning Sessions.

Lecture	1.69 (0.75)	1.52 (0.85)	-0.03, 0.37	0.226
Problem Based Learning	1.74 (0.95)	1.95 (0.72)	-0.38, -0.04	0.218
Tutorial	3.02 (0.87)	2.86 (0.96)	0.01, 0.31	0.423
Practical	3.97 (1.08)	4.16 (1.25)	-0.37, -0.01	0.429
Early Clinical Exposure	5.168 (0.77)	5.09 (0.74)	-0.17, 0.17	0.568
Computer Learning Activity	5.34 (0.88)	5.25 (0.74)	-0.02, 0	0.952

*independent Z test, 1-highest, 6-lowest scores.

Table 2
Respondent's opinion regarding the factors that affect their interest in study.

Factors affecting interest in study	Respondents Answer (%)
The clinical importance of the topic	63 %
Creativity of lecturer in teaching	37 %

is incorrect. Lack of technological facilities 52 (52 %) and too many students in one class 48 (48 %) are other

concerns raised by medical students for the practical classes being conducted. From table 3 we also came to

know that almost 71 (71 %) are finding it difficult to remember during self-study and only 29 (29%) are dependent on lecture notes only. A good sign seen from table 4 is that nearly 49 (49%) read topic ahead of lecture class and 51 (51 %) do not go through the topic before being taught. In contrary majority 90 (90 %) of students agree that it would be helpful to read and understand

topic before lecture class and only 10 (10 %) denied to this opinion. Also 69 (69 %) are of opinion that it's difficult to read and understand the topic before lecture class. If the students were mandatory told to prepare a list of problems regarding the topic then majority students agreed 77 (77 %) that they will read topic before the lecture

Table 3
Problems encountered during teaching and learning session

Problem Encountered During	Problems	Respondents Answer (%)	
		Yes	No
Lecture	Lecturers teaching method is non-interactive	64 %	
	The topic itself is hard to understand	26 %	
	Students attitude (sleep during class, not focus)	10 %	
Practical	Too many students in a group	48 %	
	Lack of technologies facilities	52 %	
Self-study	Dependent on lecture note only	29 %	
	Difficult to remember	71 %	

Table 4
Respondent's opinion regarding the preparation before the lecture

Questions	Respondents Answer (%)	
	Yes	No
Imagine this. Tomorrow, your lecturer will give you a lecture about 'Anti-Epileptic Drugs', do you read about this topic on the day before the lecture will be held?	49 %	51 %
In your opinion, do you think that reading about the topic before the lecture will help you to understand the lecture better?	90%	10%
Is it hard to be done in your circumstance as a student?	69%	31%
If it is mandatory as a part regulation that student needs to read the topic and list down the problems they encountered to understand and conceptualized the topic-will it trigger you to read first before entering the lecture class on next day.	77%	23%
If the mentioned technique is one of the method of continuous assessment for your merit system, do you think it will trigger the students to read the topic in advance?	77 %	23%

class. Seventy-seven percent students think technique mentioned will help to build their academic achievement if it is part of their continuous assessment (Table 4). Thirty two percent students think at least 1-2 question lecturers should answer, but 65 % expect 3-5 and 3 % think more than 5 to be answered in last 5 minutes time (Table 6). A student friendly environment is fruitful for transferring information to students along with lecturer's personal creativity, a common acceptance shared by everyone (Table 5). Nearly 91 (91 %) students believe if the lecturer uses a whiteboard to draw pictures, which will enhance their imagination power and efficient remembrance rather than using a power point presentation only. Around 78 (78 %) of students are of opinion agreed that after 20-30 minutes of lecture that are based on talks only is followed by lack of concentration. Majority of students 90 (90 %) agreed or preferred a two way communication in lecture class compared to a one way communication. Among medical students 76 (76 %) think a few of lecturers practice interactive learning methods (pneumonic, analogy, storytelling) during lecture session (Table 4). If medical students discuss among friends, this might improve their understanding for a certain topic and around 99 (99 %) vouched for it (Table 6). Three to four students in one group are sufficient according to 69 (69 %) of them. Another opinion lay by 56 (56 %) medical students

regarding group discussion is improvement of language skills and confidence levels in speaking. Majority 64 (64 %) of students are of opinion that the best time for discussion is same day of lecture or just after the lecture. While others 17 (17 %) and 19 (19 %) had different opinions saying best time is after 2/3 days of lecture or during weekends respectively. In the current study population 91 % agreed that problem based learning would be the best method to access the critical thinking (Table 7). For better development and understanding, PBL (75 %) is very useful as a thought of the present study population but other groups which think just a little bit (24 %) and not at all (1 %). At least 5 minutes time should be kept by the lecturers at the end of class so that medical students can ask their queries.

DISCUSSION

Students are one of the best resources available to know the quality of teaching which can be 'productive, informative, satisfying or worthwhile'.^{17,18} Research scholars have highlighted and have a belief saying that sincere efforts often give a meaningful result and teaching will get better and better when they accept criticism of students.¹⁹ Teaching evaluation done by

Table 5
Respondent's opinion regarding the interactive lecture session

Questions	Respondents Answer (%)			
Lecturer's creativity in transferring the information during lecture session is important to create a fund loving environment.	Agree (100)	Disagree (0)		
Do you think pictures drew by the lecturers on the whiteboard will help you to imagine and remember efficiently, rather than power point presentation only?	Yes (91%)	No (9%)		
Based on your experience, did you felt that your focus is easier to waver after 20-30 minutes of lecture that based on talk only?	Yes (78%)	No (22%)		
Which of the following methods that you prefer to be done during the lecture?	One way communication (10%)	Two way communication (90%)		
Did your lecturers practice interactive learning methods (pneumonic, analogy, story-telling) during lecture session?	None (14%)	Few of them (76%)	Most of them (10%)	

students can lead to changes in teaching behaviors, particularly accompanying individual consultation in which teacher is provided with an assistance in interpreting the results and devising changes in teaching practice in a non-scary and student friendly environment.²⁰ Student's better performance in an exam would definitely make the academic faculty's teaching more effective.^{21,22} Everyday Medical science is expanding broadly. Information updated today soon becomes outdated very quickly. Every health

professional, including doctor needs to update their knowledge every day. This is the reason the medical education system has a huge amount of burden on their shoulders of training new doctors in such a way that they can adopt and cope up with the new facts.²³ High concern especially for higher studies is being allotted by educational authorities of both developing and developed countries in lieu of a strong correlation between academic performance and effective

Table 6
Respondent's opinion regarding group discussion

Questions	Respondent's Answer (%)		
Do you think discussing with your friends can improve your understanding in a certain topic?	Yes (99%)	No (1%)	
How many people are you prefer to be involved in the discussion?	≤2 (21%)	3-4 (69%)	≥ (10%)
How much do you think a group discussion can help you in improving your language skills and confidence in speaking?	0%-45% (21)	46%-75% (56)	76-100% (23)
Which of the following is the best time to do the discussion?	Just after the lecture or same day of lecture (64%)	After 2/3 days of lecture (17%)	During weekends (19%)

Table 7
Respondent's opinion regarding the question-based learning.

Questions	Respondent's Answer (%)		
Do you think problem-based learning (PBL) is the best way to access your critical thinking?	Yes (91%)	No (9%)	
How far PBL methods can help you in your understanding about the topic?	Very helpful (75)	Just a little bit (24)	Not at all (1)
How many questions you expect from the lecturer to give to you to answers within 5 minutes before the lecture ends?	1-2 (32)	3-5 (65)	>5 (3)

teaching.²⁴ Studies feedback coupled with consultation would definitely improve students rating in feedback forms across the term.^{25,26} Lecture is one of the oldest preferred methods of teaching and learning in all types of education including medical sciences. Lecture is also been considered as one of the prime methods of teaching by Medical Council of India.²⁷ In our study as well, study population also considered lecture as the most preferred mode of teaching for students of DYPUSM. {Figure 1} Problem Based Learning, is defined as self-driven process in which student sets his pace and

role of the teacher becomes as a guide, facilitator and resource.²⁸ A tag of a student centered approach rather than traditional teaching method is being given to PBL making it to be more substantial and pleasant to learn. It also makes medical student to a better understanding of the topic being learnt.²⁹ Respondents in our current study also reported as high as 91 %, making PBL a topic which generates critical thinking process and also it will help to understand the topic (Table 7). Quality leaders are required for efficient educational programs capable of reframing the thinking of those who they guide and

encouraging changes as an essential component of institutional vitality.³⁰ Interactive teaching and learning methodologies need to be applied in the study procedure was the voice of majority of medical study participants. A lecturer's creativity in the transfer of information, clear illustrations, imagination and demonstration about the core concept of topic and practice of two way communications during lecture classes should be a preferred method of teaching and learning. Fellowship programs for faculty development in recent years are gaining popularity which comprise of mechanisms for strengthening instructional skills and scholarly abilities of faculty members. Such fellowships are being provided nationally and locally, providing an educational experience along with sufficient time to learn, practice and publish research.^{31,32,33} Current study noticed, in order to embrace knowledge and multi skills of learning students group discussion could play a crucial role in taking learning to a new level of understanding but some students may find it difficult to practice due to time limit and improper understanding of core concepts. Question based learning would create interest and stimulate critical thinking areas of students, empowering attention during a lecture class was also one of outcomes of this study. For successful continuous quality improvement, meaningful effort like quality skills in design and proper

implementation of program evaluations needs to be taken.³⁴

CONCLUSION

The preclinical students of DYP SUM actively participated in this questionnaire based study. The final outcome of this study would definitely help DYP SUM and other medical universities in improving learning and teaching methodologies which would contribute towards the development of knowledgeable and highly skilled medical graduates in near future. As teaching and learning is self-evolving process, a well-designed and systematic prospective research needs to carry out very often so that students get updated every year ensuring outcome of a quality efficient healthcare professional.

ACKNOWLEDGEMENT

Authors are grateful to the medical students for their participation in this study. We would also like to thank Dr. Mainul Haque for his guidance in the study. No financial issues are involved. Authors have no conflict of interest in the current study.

REFERENCES

1. Angelo TA, Cross KP. Classroom Assessment Techniques: A Handbook for College Teachers. Second Edition. San Francisco: Jossey-Bass Publishers 1993. p. 3-4.
2. Gaff JG. Faculty development in the United States. *Innov High Edu*; 1994.18:p.167-76.
3. Ozuah PO. Undergraduate medical education: thoughts on future challenges. *BMC Med Educ*; 2002, 2: p.8-10.
4. Leung WC. Competency based medical training: review. *BMJ*; 2002, 325: p. 693-96.
5. Samarakoon L, Fernando T, Rodrigo C, Rajapakse S. Learning styles and approaches to learning among medical undergraduates and postgraduates. *BMC Medical Education*; 2013, 13: article 42.
6. Koh GC, Khoo HE, Wong ML, Koh D. The effects of problem-based learning during medical school on physician competency: a systematic review. *CMAJ*; 2008, 178(1): p. 34-41.
7. Mubuuke AG, Mwesigwa C, Maling S, Rukondo G, Kagava M, Kitara DL et al. Standardizing assessment practices of undergraduate medical competencies across medical schools: challenges, opportunities and lessons learned from a consortium of medical schools in Uganda. *Pan African Med J*; 2014, 19:p. 382.
8. Jason H, Westberg. Teachers and teaching in U.S. Medical Schools. Norwalk, CT: Appleton-Century-Crofus. 1982.
9. Gaff JG, Toward Faculty Renewal. San Francisco, CA: Jossey-Bass. 1975.
10. Skeff Km, Berman J, Stratos G. A review of clinical teaching improvement methods and a theoretical framework for their evaluation. *Clinical Teaching for Medical Residents: Roles, Techniques, and Programs*, New York: Springer; 1988, p. 92-120.
11. Eble KE, McKeachie WJ. *Improving Undergraduate Education through Faculty Development*, San Francisco, CA: Jossey-bass, 1985.
12. Skeff KM, Stratos G, Campbell M, Cooke M, Jones HW. Evaluation of the seminar method to improve clinical teaching. *J Gen Intern Med*; 1986, 1: p. 315-22.
13. Newble DI, Entwistle NJ. Learning styles and approaches: implications for medical education. *Med Educ*, 1986, 20(3): p. 162-75.
14. Kharb P, Samanta PP, Jindal M, Singh V. The Learning Styles and the Preferred Teaching-Learning Strategies of First Year Medical Students. *Journal of Clinical and Diagnostic Research*; 2013, 7(6): p. 1089- 92.
15. Collins J. Education techniques for lifelong learning: principles of adult learning. *Radiographics*; 2004, 24(5): p. 1483-9.
16. Fleming ND, Mills C. Not another Inventory, Rather a Catalyst for reflection. *To Improve the Academy*; 1992, 11: p. 137-55.
17. Theall M, Franklin J. Looking for bias in all the Wrong Places – A Search for Truth or a Witch

- Hunt in Students Rating of Instruction? In: the students rating Debate: Are they Valid? How can we Best Use Them? Theall P, Abrami L, Lisa Mets (Eds.) New Directions in Educational Research, no. 109. San Francisco: Jossey Bass, 2001, p. 45-56.
18. Ellet CD, Teddlie C. Teacher Evaluation, Teacher Effectiveness and School Effectiveness: Perspectives from the USA. *Journal of Personnel Evaluation in Education*; 2003, 17(1) p. 101-28.
 19. Guilbert JJ. *Education Handbook for Health Personnel*. Delhi 110032. Shahadara CBS Publishers & Distributors, 1991, 4.p. 15.
 20. Cohen PA. Effectiveness of student-rating feedback for improving college instruction: a meta-analysis of findings. *Res High Educ*; 1980, 3:p. 321-41.
 21. Goe L, Courtney B, Little O. Approaches to evaluating teacher effectiveness. A research synthesis. Washington DC: National comprehensive center for teacher sponsored under government cooperative agreement. 2008.
 22. Archibong IA, Nja ME. Towards improved teaching effectiveness in Nigerian public universities.
 23. Jaffery N. *Medical Education, A collection of articles*. 2nd Ed. Ziauddin medical University, Karachi; 2005,p. 58
 24. Frost P, Fukami C. Teaching effectiveness in the organizational sciences: Recognizing and enhancing the scholarship of teaching. *Academy of management journal*; 1997, 40(6): p. 1271-81.
 25. Erickson GR, Erickson BL. Improving college teaching evaluation of a teaching consultation procedure. *J High Educ*; 1979, 50: p.670-83.
 26. Cohen PA. Effectiveness of student-rating feedback for improving college instruction: a meta-analysis of findings. *Res High educ*; 1980, 13: p. 321-41.
 27. Sarkar AP, Majumdar G. Perception on lecture class in Community Medicine among MBBS of West Bengal in India. *Review of Progress*; 2013, 1(17): p. 1-7.
 28. Donner RS, Bickley H. Problem based learning in American Medical education: An overview. *Bull Med LibrAssoc*; 1993, 81(3): p. 294-98.
 29. Weimer M. Problem-Based learning: Benefits and Risks. 2012. Cited 2015 Dec 12. Available at <http://www.facultyfocus.com/articles/effective-teaching-strategies/problem-based-learning-benefitsand risks>.
 30. Wilkerson L, Hodgson CS. A fellowship in medical education to develop educational leaders at UCLA. *Acad Med*; 1995, 70: p. 115-60.
 31. Skeff KM, Stratos GA, Bergen MR, Albright CL, Berman J, Farquhar JW et al. The Stanford Faculty Development Program for Medical Teachers: a dissemination approach to faculty development for medical teachers. *Teach Learn Med*; 1992, 4:p. 180-87.
 32. Bland CJ, Stritter FT. Characteristics of effective family medicine faculty development program. *Fam Med*; 1988, 20: p. 282-88.
 33. Ullian JA, Stritter FT. Types of faculty development programs. *Fam Med*; 1997, 29: p. 237-41.
 34. LuAnn Wilkerson, EdD, and David m. Irby. PhD Strategies for Improving Teaching Practices: A Comprehensive Approach to Faculty Development. *Academic Medicine*, 1998, Vol. 73, No.4/April.