

# Flipping the Training in Health Professions Education

Tabassum Naveed <sup>1</sup>, Naveed Mazhar Bhatti <sup>2</sup>, Romana Malik <sup>3</sup>

1. Department of Medical Education,HITEC-IMS, Taxila Cantt;2. Department of Orthodontics,HITEC-IMS Dental College, Taxila Cantt;3. Department of Forensic Medicine & Toxicology,HITEC-IMS, Taxila Cantt.

## Abstract

**Background:** To study the flipping or inverted method of teaching in health professionals involved in medical education

**Method:** A cross sectional study was conducted to collect data about perception of faculty regarding flipped method as a faculty training method. Convenient method of sampling was done to collect data from 31 participants. Specific objective for this purpose was to determine if there was a significant difference from the normal in perception of faculty trained by flipping the classroom? We hypothesized that there will be a significant difference in perception of faculty trained in a flipped classroom as compared to normal. The average score on the questionnaire was taken as a reference for normal.

**Results:** The results of the study were statistically significant at 95% confidence interval,  $t(30) = 7.43$ ,  $p = 0.000 < 0.05$ .

**Conclusion:** Faculty had a positive perception about flipped method of training. This method is useful and feasible for faculty training.

**Key words:** Faculty training methods Faculty training, Flipped classroom,

discussions, think-pair share and the flipped classroom.<sup>1</sup> The flipped classroom is a relatively new method of engaging students in active learning. It is a student-centered approach, compared to a traditional classroom based strategy with a scheduled didactic lecture. In this method students are provided with the learning material, recorded lecture, voice over lecture to study on their own outside scheduled teaching time. They are given enough time before the scheduled class to comprehend and learn the content. The class time is then dedicated to interactive group discussion and feedback between tutor and students and students to students. During the prescribed instruction time, a tutor facilitates discussion of the material allowing for problem solving, peer interaction, and a deeper comprehension of the concepts. An effective flipped classroom enables the students to become critical thinkers, promotes active learning and encourages the progression towards a deeper understanding of the content within the specific context.<sup>2, 3</sup> Problem based learning, peer led team learning, process oriented guided inquiry and case method <sup>4,5</sup>are pedagogical methods used for attaining these goals. This approach to pedagogy has been reported to be successful in undergraduate, nursing, residency and dental education <sup>6,7</sup>However, there is lack of evidence for its utility in faculty training. <sup>6,7</sup> Our research question for this study was to determine how do faculty perceive a flipped classroom training? The purpose of this study was to determine perception of faculty about flipped approach as a training method. We hypothesized that there will be a significant difference in perception of faculty trained in a flipped classroom as compared to average normal score on the questionnaire.

## Introduction

Flipped or inverted method of teaching, although in use in other fields, is a relatively new concept in medical education. The teaching method has received positive results when implemented in undergraduate medical, nursing and residents' education. However, its application in faculty training is sparsely reported. Internationally there is an increasing trend of collaborative learning due to increasing emphasis on team based learning, working and application of digital media and technology in learning and patient management. Methods to encourage collaborative learning are varied, widespread and generally acknowledged within medical education. Examples of structured collaborative learning methods include just-in-time teaching and team-based learning. Examples of less structured methods include case

## Method

A cross-sectional quantitative study was conducted at HITEC-IMS from February to April 2017, after approval from institutional head. Informed consent was received from the study participants according to the principles of the Declaration of Helsinki. Voluntary participation of the participants was

assured. The participants were free to leave the study at any time without causing them any difficulty. A series of five workshops were conducted from January to March 2017 at Institute of Medical Sciences, Heavy Industries Taxila to train faculty on Case based learning (CBL) as a teaching method. Convenient method of sampling was used to collect data from thirty-one participants about their perception of the training program. Participants of the study were lecturers, assistant and associate professors of basic sciences. Collaborative learning by flipped classroom method was used to train the faculty in Case method of teaching also known as case based learning (CBL). A paper based case with learning objectives was prepared and circulated as a soft copy through email to the participants for preparation at their own convenient time. Written material regarding case based learning process was prepared and was also provided as a soft copy to the participants as a guide. The participants were encouraged to reflect in writing while learning. This was followed a week later by scheduled workshop in which the case was discussed and case based teaching session was actually conducted by the participants. The facilitator acted as a guide and provided feedback to participants and clarified and summarized the issues raised at the end. Likert scale with thirteen questions was used to determine perception of participants about the flipped classroom experience (Table 1). The ratings were on a scale of 1-6. Where 1=unsatisfactory, 2=satisfactory, 3=fair, 4=good, 5=very good, 6=excellent. Minimum expected marks for each participant were 13, Maximum were 78. Scale mean was 46. Data was analyzed on SPSS version 22.0 for descriptive statistics and one sample t- test.

### Results

The mean of the thirteen-item scale was  $60 \pm 10.4$  standard deviation, which shows that data was skewed to the left. The teaching was mostly rated as very good, with highest percentage frequency of 55% for “teaching stimulates thought provoking questions” (Table 1). A one sample t-test was run to determine whether perception of participants regarding flipped classroom was different to the normal which was defined as average score of 46. Mean score was not normally distributed but was skewed to the left and there were no outliers. Mean score about perception of flipped classroom  $60 \pm 10.4$  was more than the normal score of 46, a statistically significant difference of 13.9

(95% confidence interval, 10.11 to 17.8),  $t(30) = 7.43$ ,  $p = 0.000 < 0.05$  (Table 2).

**Table 1: Descriptive Statistics for Perception about Flipped classroom**

Questions to assess perception about flipped classroom	Median $\pm$ Standard deviation	Percentage
Teaching stimulates thought provoking questions	5 $\pm$ 0.77	55%
Promotes active listening	5 $\pm$ 0.95	49%
Ensures participation of every student	6 $\pm$ 1.2	36%
Helps the group focus	5 $\pm$ 0.88	49%
Teacher restrains from teaching the topic	5 $\pm$ 1.1	42.4%
Teaching method helps students to develop concept maps	5 $\pm$ 0.88	49%
Students summarize during discussion	5 $\pm$ 0.88	42%
Students critique the learning resources they use	4 $\pm$ 1.1	33%
Students are encouraged to share learning resources with group members	4 $\pm$ 1.2	30.3%
I am able to make connections between information	5 $\pm$ 1.1	42%
Open ended questions promote discussion	5 $\pm$ 1.1	42%
Students provide feedback to their peers	5 $\pm$ 1.1	46%
I am able to summarize learning as key learning points	5 $\pm$ 0.95	39%

**Table 2: One sample t-test**

Test value is the scale mean=46						
	T	Df	Sig. (2-tailed)	Mean difference	95% Confidence Interval of the difference	
					Lower	Upper
Mean score for each participant	7.43	30	.000	13.94	10.11	17.8

## Discussion

Results show that participants had a positive perception about flipped classroom. Although there is a paucity of studies regarding application of flipped classroom in faculty training, but, the results of our study are supported by many studies in different areas of medical education. A study conducted on flipped classroom perception instrument (FCPI), the first validated measure of participants' perceptions of a continuing medical education flipped classroom, advocates the necessity to explore flipped classrooms.<sup>8</sup> Results of a study conducted on ophthalmology clerkship showed that flipped classroom is effective in teaching and helped develop skills of team working, creative thinking and problem solving.<sup>9</sup> Students and teachers were more satisfied with the flipped classroom compared to a lecture. Flipped classroom was also favoured in emergency medicine teaching and by anaesthesia, obstetrics and gynecology residents.<sup>10,11,12</sup> However, an international cross over study found mixed statistical results and both traditional lectures and flipped classroom had comparable results.<sup>13</sup>

Flipped classroom method has also found its grounds in medical education in Pakistan. A study conducted at Department of Anatomy Liaquat University of Medical and Health Sciences Hyderabad, Sindh, found very positive response of students to this approach, and its importance in future medical education.<sup>14</sup> A study conducted at Islamic International Medical College, Rawalpindi<sup>15</sup> reported that 84.5% students liked flipped classroom teaching.<sup>15</sup> Useful interaction, retention of knowledge, concept development and active learning, individual student attention, and applied knowledge were identified as strengths of the class. Noise, inadequate time, deficiency of self-confidence, and indifferent attitude of some students were identified as difficulties in engaging students' in the class.

Flipped learning is an inverted learning approach. The reasons for the positive perception about flipped classroom may be that, it takes into account that learners have different learning styles and abilities and it enables the students to learn at their own pace and style according to their learning needs. Hence it is a truly student-centered approach<sup>16</sup> and addresses the need of international and national accreditors of medical education to promote a self-directed learning environment.<sup>16</sup> It addresses the needs of the digital age students of generation. Internet allows learner access to information in a global perspective and enables them

to be a part of global village. The negative perceptions about flipped classroom and slightly lower rating for learning resources can be addressed by redefining accreditation standards, reforming physical and administrative structures of institutes, introduction of digital learning objects<sup>18</sup>, student and teacher training and development of standards and criteria for assessment.<sup>17</sup> Teachers can adopt the four pillars of "Flipped Learning Network" to design and implement flipped learning. The results of the study are useful for further defining program objectives but cannot be generalized because of small sample size. Further studies should be carried out to compare this method with other faculty training methods. Faculty members not used to the terminologies might be overwhelmed studying at their own with their additional responsibilities hence protected time should be given to participants for this purpose.<sup>18</sup>

## Conclusion

1. Flipped classroom is a promising new approach for faculty training. Learning resources developed for this purpose have to be customized to the need of the program and participants as traditional content used for a traditional lecture based class will not be sufficient.
2. The role of the teacher<sup>19</sup> will have to be accepted from that of a "content deliverer" to that of a "content developer" for which competencies in scholarship and evidence based practices are required.
3. The students will also have to prepare for delivering content and practicing communication and presentation skills.

## References

1. Pluta WJ, Richards BF, Mutnick A. PBL and beyond: trends in collaborative learning. *Teach Learn Med.* 2013;25(1):9-16
2. Gillispie V. Using the Flipped Classroom to Bridge the Gap to Generation Y. *Ochsner J.* 2016;16(1):32-36.
3. Moffett J. Twelve tips for flipping the classroom. *Med Teach* 2015; 37(4): 331-36.
4. Thomas E, Jack K, Vicky M, Richard SM, Terry P. Pedagogies of engagement in science: A comparison of PBL, FOGIL, and PLTL. *Biochem Mol Biol Educ.* 2008; 36(4):262-73.
5. Thistlethwaite JE, Davies D, Exeochoa S, Kidd JM, MacDougall C, Mathews P, et.al. The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. *Med Teach* 2012; 34(6):e421-44.
6. Morgan H, McLean K, Chapman C, Fitzgerald J, Yousaf A, Hamoud M. The flipped classroom for medical students. *Clin Teach* 2015; 12(3):155-60.
7. David G, Evava SP, Gordon A, Karin M, Mark JG. Increased Preclass Preparation underlies student outcome improvement in the flipped classroom. *CBE Life Sci Educ.* 2015 Dec 1;14(4): ar36.
8. Stephenson CR, Wang AT, Szostek JH, Bonnes SL, Ratelle JT, Mahapatra S, et.al. Flipping the continuing medical

- education classroom: Validating a measure of attendees' perceptions. *J Contin Educ Health Prof.* 2016 Fall;36(4):256-62.
9. Lin Y, Zhu Y, Chen C, Wang W, Chen T, Li T, et.al. Facing the challenges in ophthalmology clerkship teaching: Is flipped classroom the answer? *PLoS One.* 2017;12(4):e0174829.
  10. Tan E, Brainard A, Larkin GL. Acceptability of the flipped classroom approach for in-house teaching in emergency medicine. *Emerg Med Australas* 2015;27(5):453-9.
  11. Hendrickse A, VanDyke K, Trawicki MC, Rankin D, Guldan GJ, Hand W, et.al. Results of a flipped classroom teaching approach in anesthesiology residents. *J Grad Med Educ.* 2017;9(4):485-90.
  12. Hampton BS, Raker CA, Sung VW. Implementation and evaluation of a novel operating room curriculum for the obstetrics and gynecology clerkship. *J Surg Educ* 2014;71(4):521-9.
  13. Riddell J, Jhun P, Fung CC, Comes J, Sawtelle S, Tabatabai R, et.al. Does the flipped classroom improve learning in graduate medical education? *J Grad Med Educ* 2017;9(4):491-96.
  14. Memon S, Goswami P, Iqbal AI, Baloch S. Second year MBBS students' views about flipped class room practice in neuroanatomy course. *J Postgrad Med Inst* 2016; 30(3): 244-9.
  15. Raveendranath V, Venkatesh SM, Parkash C. Perception of MBBS students to "flipped class room" approach in neuroanatomy module. *Anat Cell Biol.* 2015 Jun; 48(2): 138-43.
  16. Ramnanan CJ, Pound LD. Advances in medical education and practice: student perceptions of the flipped classroom. *Adv Med Educ Pract.* 2017;8(1):63-73.
  17. Clark RC, Mayer RE. In: Taiiff R eds. *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning.* 4th edition. John Wiley & Sons, Inc, USA:2012.
  18. Sharma N, Lau CS, Doherty I, Harbutt D. How we flipped the medical classroom. *Med Teach* 2015; 37(4): 327-30