

# Facilitative Learning in Physiology-Problem Based Learning Approach.

R. Sirisha<sup>1</sup>, Pitta Paramjyothi<sup>2</sup>

<sup>1</sup>Assistant Professor of Physiology, Guntur Medical College, Guntur, Andhra Pradesh

<sup>2</sup>Associate Professor of Physiology, Guntur Medical College, Guntur, Andhra Pradesh

## ABSTRACT

**Background:** Problem-Based Learning is a student-centred and self-directed teaching approach. The role of the teacher is to facilitate learning by the student. The Students and faculty were introduced to Problem Based Learning for better understanding the Physiological mechanisms and to improve the scoring. **Methods:** To introduce Problem Based Learning and to reinforce active, self-directed learning, problem solving skills and to improve the performance. Conventional Tutorial was conducted on the topics of endocrinology and 40 marks test taken. Orientation towards conducting sessions for Problem Based Learning was given to faculty and evaluated after the presentation by students. **Results:** All aspects of Problem Based Learning received higher rating than conventional tutorial. Students preferred Problem Based Learning with highest score 62%. Both Problem Based Learning and conventional sessions are opted by 27% of students. Only 11% .Students showed interest towards Conventional Tutorial. Mean score of the written test assessment after Problem Based Learning showed significantly higher than the Conventional Tutorial. Z test is applied.  $Z = 3.26 > 1.80$ ,  $P < 0.05$ . **Conclusion:** When compared with the conventional tutorial teaching, Problem Based Learning facilitated learning and inspired the students' activity, creativity, train their comprehensive abilities and improved their performance.

**Keywords:** Facilitation, Performance, Problem Based Learning (PBL).

## INTRODUCTION

Normal educational process can be considered as an interaction between teacher and the student. The role of the teacher is being to facilitate the performance of tasks by the student. Low scores noted in the formative assessment examination have various reasons apart from academic stress. They are rankers in qualifying examination. The present study was undertaken to know the students perception towards a conventional tutorial, to introduce Problem Based Learning to reinforce active, self-directed learning, problem solving skills and their performance. The aim of the study was to adopt the student to problem solving approach by applying the concepts and principles of physiology to clinical problems.

### Name & Address of Corresponding Author

Dr. R. Sirisha  
Flat No: 102, A-Block, Swarna Arcade, 6/10,  
Brodipet, Guntur- 522002,  
Andhra Pradesh.  
E mail: sirisha.mahesh999@gmail.com

## MATERIALS AND METHODS

To introduce and facilitate learning through the PBL approach in physiology in order to improve performance skills in clinical aspects to correlate the Physiological mechanisms. After obtaining permission from the Institutional Ethical Committee, the study was conducted on 184 1st year MBBS students of 2015 batch at Guntur Medical College, Guntur AP. The student willingness to participate in

the sessions and their awareness about PBL was assessed. Conventional tutorial was conducted on the topics of endocrinology with 40 marks test taken. The scheduled classes time allotted for tutorial classes in Physiology are converted to PBL for orientation, sessions, evaluation and presentation by students. Well-designed structured questionnaire collecting information on different aspects was formulated based on literature review. The responses of the students were evaluated on various aspects on 3-point Likert scale as yes, sometimes, no. They are encouraged to opine freely about their views. Students were subjected to test for 40 marks again after PBL. The same questions are given and evaluated.

PBL sessions are divided in to 3 phases. 1) Preparation 2) Conduction 3) Evaluation.

### 1) Preparation:

a) Orientation to faculty and students: Teaching faculty whoever interested was briefed about methodology and their role as facilitator to make the sessions to be interactive. The student willingness to participate in the sessions and their awareness about PBL was assessed.

b) Selection of topics; Topics are brief, formulated and framed to match the student level of acquisition of knowledge. The construction of cases was done in such a way that they will stimulate learners to pursue relevant learning issues, facilitate small group discussions, give learners feedback and guidance as needed. The same topics covered in conventional tutorial are converted in to PBL questions.

### 2) Conducting PBL:

After the interactive session to orient the students, about PBL and they were divided into groups. Each group was given a clinical problem in which the symptoms of a particular endocrine disorder were made very clear and questions were given. The group was further sub divided and faculty kept an eye on all the students and are encouraged to participate. The students were given enough time to study, discuss among them-selves and follow the textbooks of physiology, clinical medicine depending upon the problem given. The faculty facilitated the learning process of each student though out the class. Finally, students presented seminar on the topics allotted.

**3) Evaluation:**

The response of the students was evaluated on various aspects on Conventional tutorial and PBL.

**RESULTS**

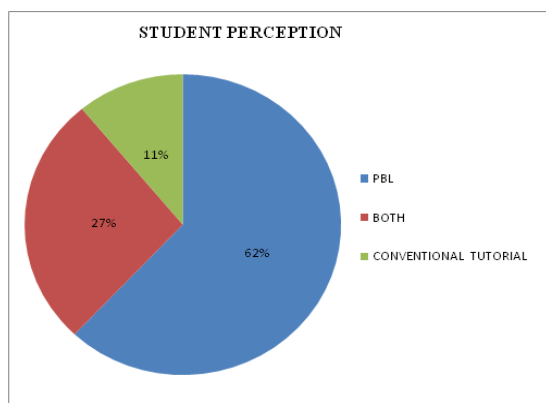
184 students out of 200 students answered to the questionnaire. 44 students have some idea about PBL. All aspects of PBL received higher rating than conventional tutorial [Table 1; Figure 1]. Conventional Tutorials did not receive yes rating to different aspects. Mean score of written test assessment (Short essay questions) after PBL was significantly higher than the conventional tutorial [Table 2; Figure 2]. PBL had highest score against conventional tutorial [Table 3; Figure 3]. Z test is applied.  $Z = 3.26 > 1.80, P < 0.05$

**Table 1: Overall response of Students**

PBL	Conventional Tutorial	Both
62%	11%	27%

**Table 2: Student perception**

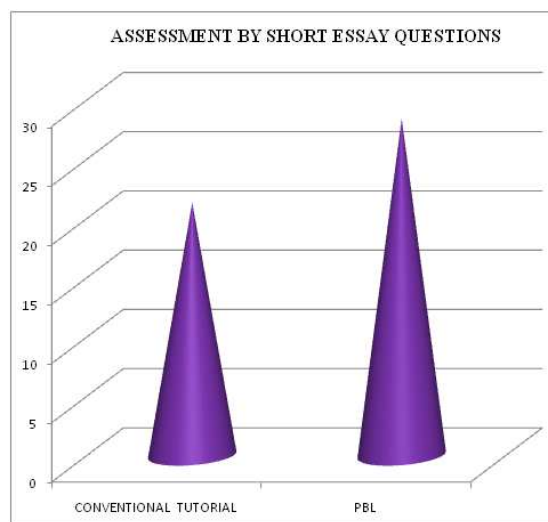
Response	Conventional Tutorial (n = 184)	Problem Based Learning (n = 184)
Interaction	14.1	78
Participation	34.2	71.4
Understanding	32.6	88



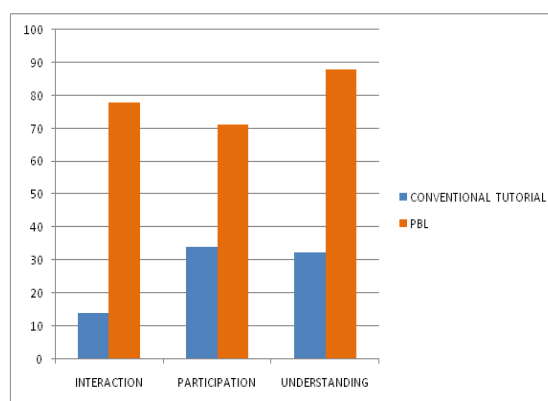
**Figure 1: Overall response of students**

**Table 3: Student performance in Short Essay Questions.**

Maximum Marks (40)	Conventional Tutorial (Mean ± SD)	PBL (Mean ± SD)
Marks obtained	21.3±5.71	28.4±6.42



**Figure 2: Student perception**



**Figure 3: Student performance in short essay questions**

**DISCUSSION**

PBL is a student-centred and self-directed teaching approach. Compared to traditional teaching approaches, PBL breaks the traditional discipline-based boundaries, inspires the students' activity, creativity and train their comprehensive abilities. There is evidence that active learning, student-centred approaches to teach physiology work, they work better than approaches that are more passive. The problems engaged curiosity in students to drive their learning. Students have learnt to ask critical questions, to identify what they need to know to answer their questions, and where to find the answers. They are able to apply the disciplinary content, develop critical thinking abilities, acquired skills of communication, and team building. Early

exposure of students to clinical settings and motivation to learn is self-imposed; Students can apply practical knowledge acquired during their studies, acquisition of various skills for lifelong learning. PBL also helped to improve tutors' professional competence. PBL emphasizes student-directed learning to make use of knowledge stimulated by the challenge of solving real-world problems in tutor-led small groups. Learners benefit most from opportunities to solve authentic problems in tutor-led groups, which stimulate study of individually determined "learning issues" followed by application of the information. Students are motivated to participate in-group discussion to study outside of the class because of their interest in the case and to contribute their share. Preparation for an end-of-unit exam is a motivation, but to a lesser extent. The exam tends to emphasize essay questions. PBL improved ability to solve problems, reason critically, content acquisition, understanding, ability to communicate and work effectively in tutor-led groups.

## CONCLUSION

PBL is a student-centred self-directed teaching approach when compared to the conventional tutorial teaching. PBL facilitated learning, inspired the students' activity, creativity to train their comprehensive abilities, and improved their performance. PBL found to be the most useful tool in terms of independent learning, interaction, orientation and student presentations.

## REFERENCES

1. Boss S. Project-Based Learning: A Short History. *Edutopia* 2003;13:145-50.
2. Carrió M., Larramona P., Baños J. E., & Pérez J. The effectiveness of the hybrid problem-based learning approach in the teaching of biology: a comparison with lecture-based learning. *J Biol Edu.* 2011;45(4):229-232.
3. Reynolds JM, Hancock DR. Problem-based learning in a higher in medicine. *Br Med J* 2010;23:115-9.
4. Tait E. Problem based learning. *Br Med J.* 2010;326(7384):328.
5. Mikkila-Erdmann M, Sodervik I, Vilppu H, Kaapa P, & Olkinuora, E. First year medical students' conceptual understanding of and resistance to conceptual change concerning the central cardiovascular system. *Ins Sci Int J Learn Sci.* 2012;40(5):745-754.
6. Tatar E, Oktay M. The effectiveness of problem-based learning on teaching the first law of thermodynamics. *Research in Science & Technological Education.* 2011;29(3):315-332.
7. Wirkala C, Kuhn D. The Experiential Learning Center. (n.d.). *What is scenario-based learning?* Retrieved September 8, 2012, from <http://learnpbl.com>.
8. Tait E. Problem-based learning in K-12 education: is it effective and how does it achieve its effects? *Am Edu Res J.* 2002;48(5):1157-1186.
9. Chi MTH. *Instructional Science: An International Journal of the Learning Sciences*, 40(5), 745-754.
10. Tatar E, Oktay M. The effectiveness of problem-based learning on teaching the first law of thermodynamics. *Research in Science & Technological Education.* 2011;29(3):315-332.
11. Wirkala C, Kuhn D. The Experiential Learning Center. (n.d.). *What is scenario-based learning?* Retrieved September 8, 2012, from <http://learnpbl.com>.
12. Bransford JD, Brown AL, and Cocking RR (editors). *How People Learn: Brain, Mind, Experience, and School.* Washington, DC: National Academy; 1999.
13. Briscoe C, LaMaster SU. Meaningful learning in college biology through concept mapping. *Am Biol Teacher.* 1991; 53: 214-219.
14. Burrowes PA. Lord's constructivist model put to a test. *Am Biol Teacher.* 2003;65:491-502.
15. Chi MTH. Commonsense concepts of emergent processes: why some misconceptions are robust. *J Learn Sci.* 2005;14: 161-199.
16. Chi MTH, de Leeuw N, Chiu MH, and LaVanher C. Eliciting self-explanations improves understanding. *Cog Sci.* 1994;18: 438-477.
17. Chi MTH, Bassok M, Lewis MW, Reimann P, and Glaser R. Self-explanations: how students study and use examples in learning to solve problems. *Cog Sci.* 1989;13:145-182.

**How to cite this article:** Sirisha R, Paramjyothi P. Facilitative Learning in Physiology-Problem Based Learning Approach. *Ann. Int. Med. Den. Res.* 2016;2(1):248-50.

**Source of Support:** Nil, **Conflict of Interest:** None declared.