

Comparative Study on Problem Based Learning against Conservative Learning Method among Undergraduate Medical Students

S.P. Jai Prabhu*, K. Prabhu, Balaji Karunakaran and Yuvaraj Maria Francis

Abstract--- *Problem Based Learning (PBL) has been found to be an effective tool for a lifelong learning. PBL and routine lectures are different in so many ways, as PBL require active participation of the students. In PBL, the problem has to be analyzed by the student(s) himself and he has to be understood and has to find a solution to the problem, which will eventually improve the cognitive ability and thought processes of the students. Medical stream is different from others as in this field professionals have to develop lifelong learning habits. More over to become a successful doctor one should develop the skills to integrate the basic medical sciences with the clinical subjects. Through PBL a lifelong learning can be accomplished and it be an effective tool. PBL is different from routine lectures as it makes the students to participate actively. The aim of this study is to analyse the validity of Problem Based Learning (PBL) as teaching tool and perceptions of the students. Phase I MBBS students, 150 in total, has voluntarily participated in the study. All the students were randomly divided in to 10 groups with each group having one teaching faculty as in-charge. Before and after each PBL sessions, Multiple Choice questions (MCQ) test was conducted. Along with regular teaching, most of the students preferred to have PBL. The favourable response and acceptability and positive impact on the students made us to continue using more PBL sessions. Further, conducting workshops on PBL may help the medical faculties who are all involved in curriculum development to consider PBL to be incorporated in medical Curriculum, since it can have a positive impact in the process of learning. And implementation of PBL in Medical curriculum requires more number of multi-centred studies which can establish the need for PBL and it's the benefits in the teaching process of student population.*

Keywords--- *Critical Thinking, MBBS, Medical Curriculum, Problem Based Learning, Teaching Tool.*

I. INTRODUCTION

Simply narrating is not teaching and learning is not merely listening. Learning by conventional method revolves around the instructor and it is teacher centric, where the students does not actively participate but remain as passive receivers of information. While on the other hand in PBL which is students centric, a guide or facilitator will assist the students to solve the problem or to derive a conclusion, and in the modern system of education this is the focal point. In all active learning process, the learners learn according to their own needs and pace (Orhan & Ruhan, 2006). Human beings face problems with multiple dimensions in their lives and everyone try to decode all these

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problems in their own way with the help of all the experiences and understanding. This will ultimately improve their recognition and perception to the problem.

Problem-Based Learning (PBL) is one of the methods of teaching in which complex, day-to-day or real problems are used as the vehicle to promote student learning, by which the concepts and basics are better understood which is in contradiction to the conventional method of teaching where a direct presentation is given about the facts and subjects. PBL represents a major complex widespread change in the educational practice to enhance the integration of basic and clinical sciences. Problem based learning and integrated teaching are made mandatory in competency based medical education for undergraduate medical curriculum by the Medical Council of India (MCI). Hence testing the efficacy of PBL as teaching tool among medical student is need of an hour. Hence the aim of this study is to evaluate the effectiveness of problem based learning as a methodology to teach undergraduate students. The main objective of this study is to provide a critical overview of PBL, to know the effectiveness of PBL for knowledge acquisition and clinical programme and the practicality of its introduction and its acceptance by medical students.

II. MATERIALS & METHODS

The participants were undergraduate medical students (Phase I) who undergone systematically conducted PBL session in the middle of their academic year after having experienced traditional teaching method in Anatomy. The procedures in PBL are 1. The students were presented with Stimulus (problem) by dividing them into a small group and no advanced reading / lectures are done. 2. Identification of key facts, missing information and brainstorming. 3. Students are encouraged to asking questions, self-directed learning and assimilate new relevant information. 4. All solutions to the given problem are presented by students with their reviews. 5. After the discussion, the students were asked to apply the information to solve the problem with the tutor's review of the process. Through conducting pre and post-test after taking a problem solving session on anatomy topics for students. A questionnaire was prepared, designed and validated before the study. The questionnaire was distributed to students and the survey was conducted in the college environment during anatomy hours where the questionnaire was given to the students. The students were asked to fill the questionnaire accordingly and the survey was plotted statistically in a bar graph.

III. RESULT

Traditional teaching method significantly increases the knowledge of specific topic, but it failed to considerably improve problem solving skills and clinical reasoning whereas, knowledge of students who had PBL session remained the same but there was significant improvement in their problem solving skills and clinical reasoning. Assessment of students after their PBL and traditional teaching method shows increase in the mean score of PBL students when compared with traditional teaching method. Even though there is a positive change, it is not significantly difference (Figure 4).Development of interest, motivation, learning efficiency, curiosity, questioning attitude, interpersonal relationship, independent thinking and reasoning are more through PBL as compared to traditional method of teaching which is more in favour of Information gathering and student-teacher relationship. PBL triggered the cognitive and reasoning skills of the students, but was found to be time consuming and the knowledge acquired was not always relevant in solving the problem presented.

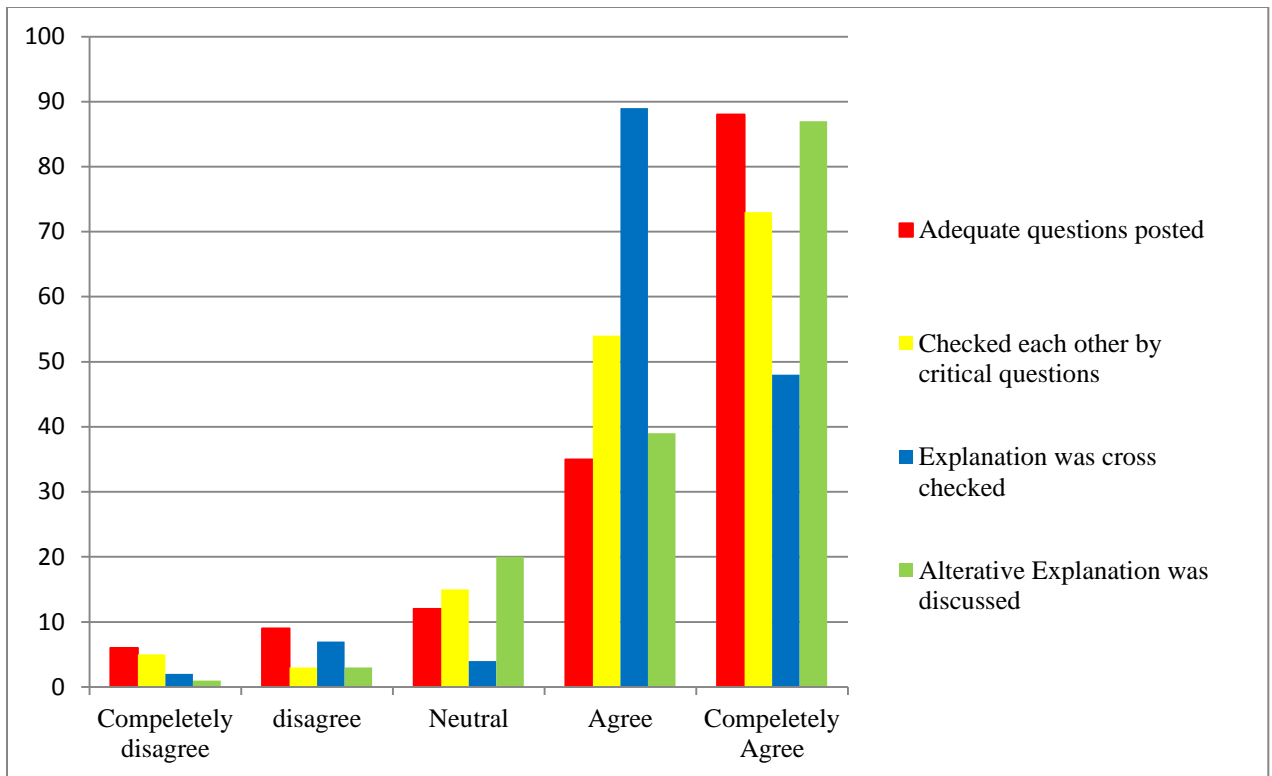


Figure 1: Graph Showing Feedback for Exploratory Questions during PBL Session

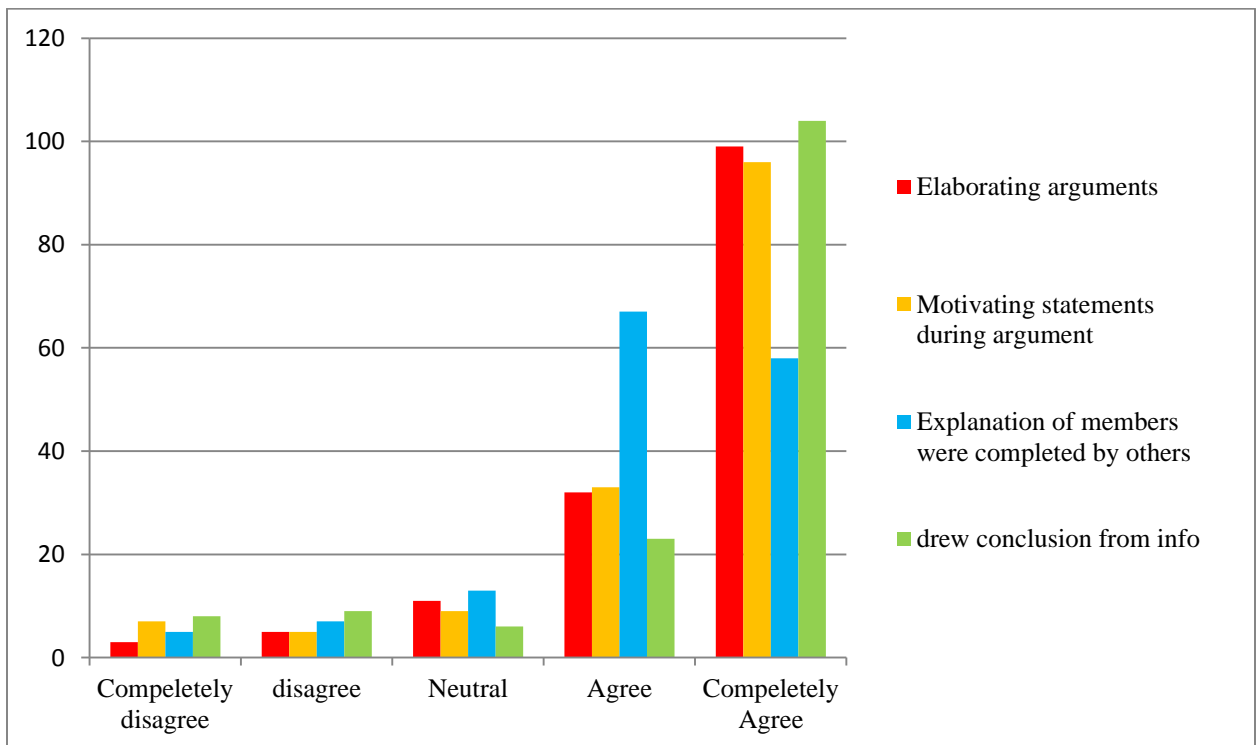


Figure 2: Graph Showing Feedback for Cumulative Reasoning during PBL Session

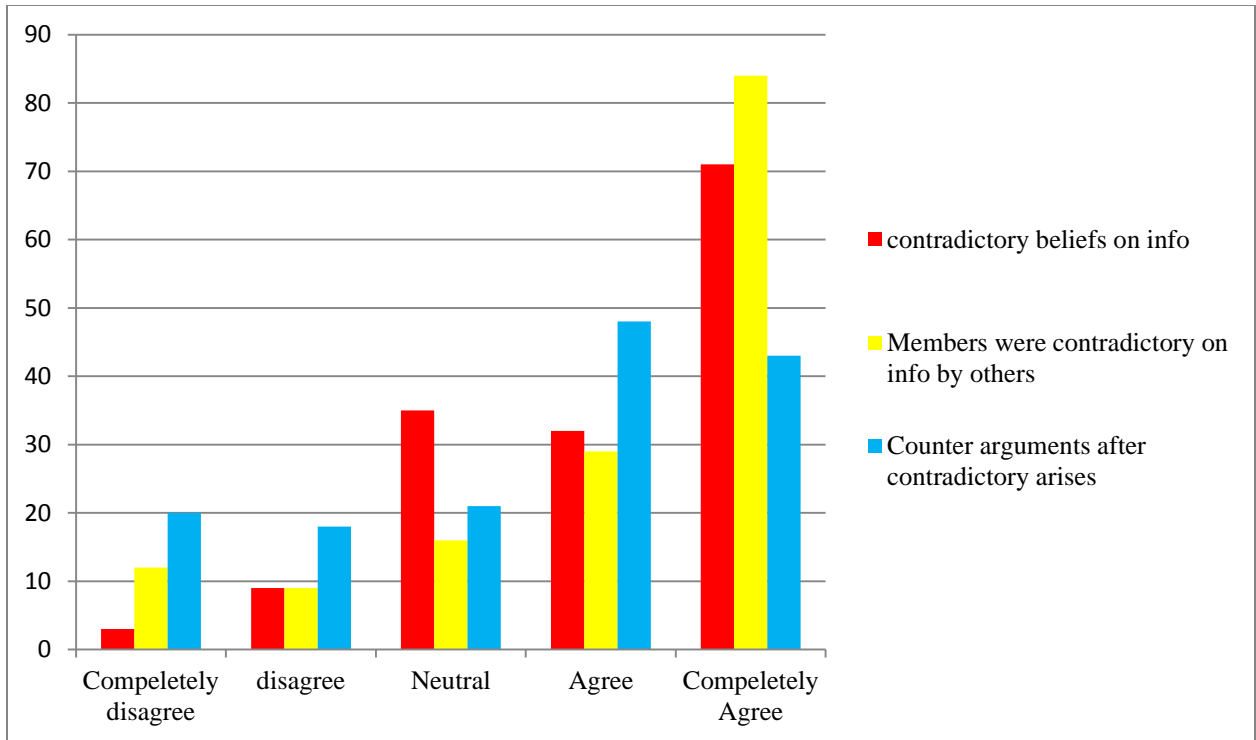


Figure 3: Graph Showing Feedback for Handling Conflict during PBL Session

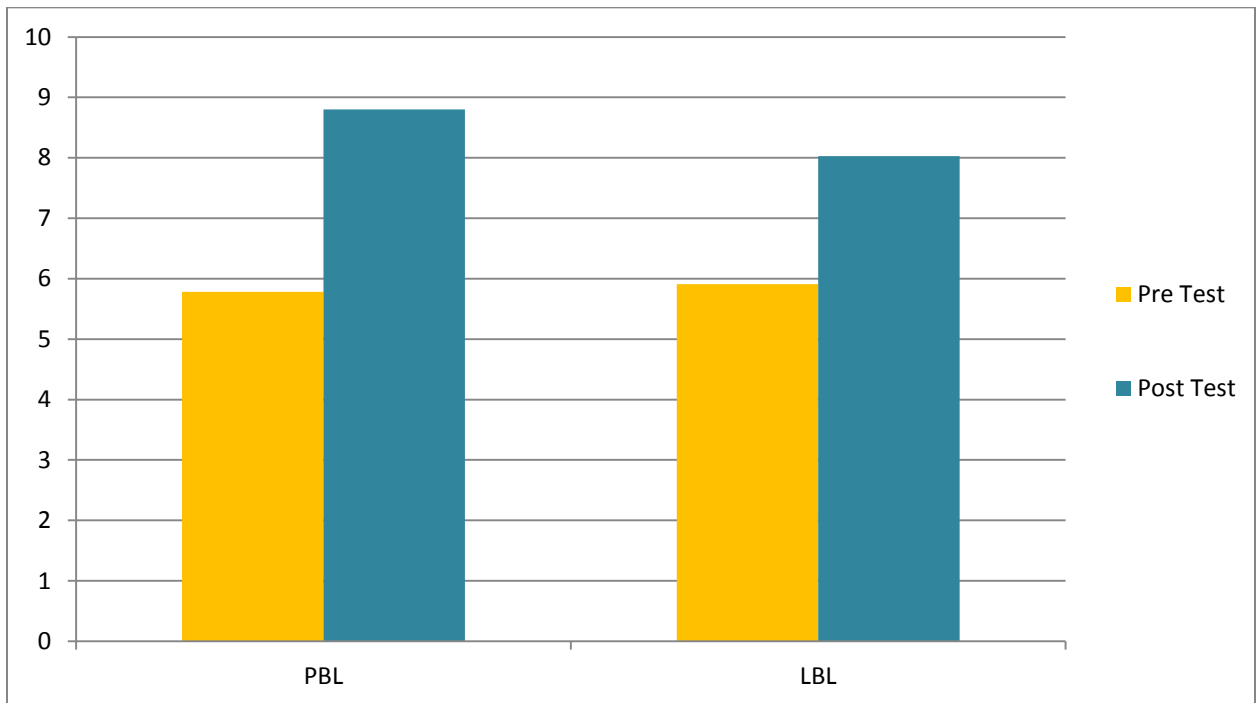


Figure 4: Graph Showing Comparison of PBL Session with Traditional Teaching Method

IV. DISCUSSION

PBL is a student oriented study in small groups with emphasis on self-directed learning and team work. From

this study we found that most students were enthusiastic in brain storming and came up with relevant questions. They were self-driven to acquire knowledge for solving the problem. But a minority did not actively participate in the discussion. Sometimes the questions had little relevance and without the guiding presence of an expert came to erroneous conclusions. According to Katinka JAH Prince et al, PBL Students were found to have the same perceived level of anatomical knowledge as the non PBL Students. However the work of Elstein et.al. and Norman & Schmidt suggest that there is no evidence that one form of curriculum can enhance general problems solving skills. Albanese and Mitchell concluded that PBL did not permit the students to develop adequate cognitive scaffolding and thus lead them to make diagnostic errors and raised doubts as to the adequacy of the fund of knowledge these students had acquired. In Summary, different studies on PBL have conflicting evidence regarding the acquisition and retention of knowledge in the PBL environment. The advantage of PBL are self-directed learning, emphasis on team work, improves communication skills, lateral thinking, and clinical reasoning, enhances critical thinking and evidence based decision making, knowledge acquisition and retention prepares them to face real life situations in future clinical practice. PBL has got its own limitation such as time consuming, lack of expert guidance and initiative among students, uncertainty with information overload.

V. CONCLUSION

PBL lays the foundation for reasoning and lateral thinking which are the basic qualities a budding physician should have to become a good medical practitioner. There is conflicting evidence on the effectiveness of PBL in medical students, because of its dependence on variable factors like individual participation, communication and cognitive skills, team work and tutor facilitation. Hence further studies with large sample size with standard parameters are needed to accept PBL is an effect teaching tool. PBL can be adopted with necessary changes in the medical curriculum.

REFERENCES

- [1] Ahmad, M, 2011. Effect of problem solving teaching strategy on the performance of 8th grade students. PhD unpublished thesis, University of the Punjab, Lahore.
- [2] Albano, M. G., Cavallo, F., &Hoogenboom, R., 1996. An international comparison of knowledge levels of medical students: the Maastricht Progress Test, *Journal of Medical Education*, 239-245.
- [3] Chin, C. & Chia, L. G, 2004. Problem-based learning: Using students' questions to drive knowledge construction, *Journal of Science Education*, 88(5).
- [4] Dyer, J. E, & Osborn, E. W, 1996. Effects of teaching approach on problem solving ability of agricultural education students with varying learning styles. *Journal of Agricultural Education*, 37, No. 4, 1996.
- [5] Iqbal, M, 2004. Effect of cooperative learning in academic achievement of secondary school students in mathematics (Unpublished P.hD. thesis) *University of Arid Agriculture Rawalpindi (Pakistan)* PP. 2-3.
- [6] Khan, A., Akhter, A, &Hukmadad, 2010. Asian school science. *Effect of using problem solving method in teaching mathematics on the achievement of mathematics Students.*
- [7] Kousar, P, 2010. Effect of the problem-solving approach on academic achievement of students in mathematics at the secondary level. *Contemporary Issues in Education Research.*
- [8] Stepin, W. J., & Gallagher, S. A, 1993. Problem-based learning: As authentic as it gets. *Educational leadership*, 50(7).
- [9] Tang, j., & Huang, M, 2006. An application of problem-solving model on the auto mechanics practicum course in vocational high schools *Jouranal of Eductaion and Psychology*, 29(3).
- [10] Yusof, M, Y. & Tall, D. O, 1995. Professors' perceptions of students' mathematical thinking: Do They Get What They Prefer or What They Expect? In L. Meira&D. Carraher, (Eds.), *Proceedings of PME 19*, II,pp, 170-17.