

# Perceptions of Students and Faculty Regarding Problem Based Learning- Private and Public Sector Comparison

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## Abstract

**Background:** To study and compare the perception of students and faculty regarding problem based learning, in a public and a private sector medical college of Pakistan.

**Methods:** In this mix method study in a private sector and a public sector medical college, in both these institutes, the curriculum for first year was divided into system based modules. Basic Sciences teaching was augmented by problem-based learning (PBL) in an integrated manner. Students were allocated randomly to batches, each comprising of 14-15 students. One facilitator was randomly allocated to each student's batch. The response of students was evaluated based on structured questionnaires and their assessment was done by the faculty on structured evaluation forms.

**Results:** Student's response was categorized in four groups; quantitative analysis showed that majority of students from group A and B agreed that all members were involved as a team (62.6% & 57%), newly introduced PBL facilitated their learning process (64.9% and 61.8%), the learning environment was beneficial (55.3% and 67.1%), and facilitator was helpful to complete the task given (78% and 64.54%). The facilitators rated the performances of the students based on a scoring system. The mean score of the students regarding their performances was 14.74 (SD±3.255) in group A and 10.64 (SD±4.55) - in group B; the maximum attainable scores being 20. The difference between their scores was statistically significant (P value <0.01).

**Conclusion:** There is no difference in perception of students in a public and private medical college regarding PBL but there is statistically significant difference in performance of students, public sector students getting higher scores.

**Key Words:** PBL, Learning environment, Small group teaching

## Introduction

The old model of passively learning facts and reciting

them out of context is no longer sufficient to prepare students to survive in today's world. Solving highly complex problems requires that students have both fundamental skills (reading, writing, and math) and digital-age skills (teamwork, problem solving, research gathering, time management, information synthesizing, utilizing high tech tools). With this combination of skills, students become directors and managers of their learning process, guided and mentored by a skilled teacher. PBL helps students to gain these skills.<sup>1</sup> PBL is not just a way of learning; it's a way of working together. If students learn to take responsibility for their own learning, they will form the basis for the way they will work with others in their adult lives. Accordingly, students are encouraged to take responsibility for their group and organize and direct the learning process with support from a tutor or instructor. Advocates of PBL claim it can be used to enhance content knowledge and foster the development of communication, problem-solving, and self-directed learning skill.<sup>2</sup> PBL is typically organized with small groups of learners, accompanied by an instructor or facilitator. During the PBL process learners discuss problems, define what they know, generate hypotheses, derive learning goals and organize further work.<sup>3</sup> A PBL cycle should conclude with learners reflecting on the learning that has taken place.<sup>4</sup> The available evidence indicates that factual knowledge is the essential base for developing the problem solving skills of a good clinician. PBL does not sacrifice important areas of knowledge; thus, PBL can be summarized as a small group teaching method for both acquisition of knowledge and development of generic skills. The debate whether "new" integrated curriculum augmented with PBL will actually produce better doctors compared to the traditional curriculum is still going on.<sup>5</sup> But PBL is a highly resource rich activity, requiring not only well furnished tutorial rooms, but also ready access to first-class libraries and computer facilities.<sup>6</sup> There is a lot of enthusiasm for problem-based learning (PBL), yet there is very little experimental evidence regarding its effectiveness.<sup>7</sup> So it

was decided to start PBL with integrated modules and compare the perception of students in a public and a private medical college.

### Subjects and methods

The study was carried out in a class of first year MBBS students at a government sector medical college (Group A) during the year 2007-08 and at a private sector medical college (group B) during 2013-14 for a duration of six months. Total 370 students were included in the study by convenient sampling technique. All the students of first year from both institutes, both male and females were included in the study and informed consent was taken from the students. Ethical permission was taken from ERB of both Rawalpindi Medical College and Rawal Institute of Health Sciences. First year undergraduate class in both institutes was exposed to Problem Based Learning sessions of two hours. The whole class was randomly divided into batches of 14/15 students each. There were 20 batches in group A and 7 in group B. Each batch was facilitated by a randomly assigned faculty member from the basic and clinical sciences. These PBL facilitators were trained through workshops and the 'training of trainer' program, in the same manner as documented in literature. Initially RMC used space in its library and anatomy museum for the small group sessions and RIHS used the basic sciences laboratories.

PBL tutorials implemented in this study has been modeled after the Maastricht 'seven jump process'. Standardized questionnaire forms were used for evaluation after exposure to PBL. The questionnaires were designed to evaluate different aspects of PBL. The facilitator and the PBL was evaluated from student by ten statements assessing the facilitator and the PBL process on a five point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. The evaluation form was filled in by the students anonymously. The entire group was evaluated by facilitator by marking each student individually for their role in the group process. There were four categories and the marks were given out of a maximum of 20. p-value of <0.05 was considered statistically significant.

### Results

Majority of students from group A and B agreed that all members were involved as a team (62.6% & 57%). Newly introduced PBL facilitated their learning process (64.9% and 61.8%), the learning environment

was beneficial (55.3% and 67.1%), and facilitator was helpful to complete the task given (78% and 64.54%) (Table 1). Environment is the basic of any kind of learning and this was appreciated by more than half of the students. Regarding assessment of facilitator by students, participants in both groups agreed that facilitators created a supportive group climate during the sessions and showed concern with progress of individuals. The difference in mean values of the student's response was statistically insignificant (Table 2). Facilitators rated the performances of the students. The mean score of the students out of 20 was 14.74 (group A) and 10.64 (group B), the difference being statistically significant (Table 3).

**Table1: PBL- Response of students**

Category	Students response mean Group A	Students response mean Group B	p value
Self perception of learning: All members of group participated in discussion equally; Working as a team was productive	62.6%	57%	≥ 0.5
Process of learning: The use of problems as learning tool facilitated your learning; Working in groups improved understanding of the subject; Completing assignments related to PBL problems was easy	64.9%	61.8%	≥ 0.01
Environment of learning: Using electronic resources, primarily the internet, to find information was easy; Library resources, other than electronic ones, were accessible; Use of computers as an investigative tool in the laboratory was beneficial	55.3%	67.1%	> 0.01
Facilitator's assessment: Facilitator did not dominate group discussion; Facilitator created a supportive group climate; Facilitator showed concern with progress of individuals; Encouraged involvement of group members; Facilitator kept the group focused on the task; Facilitator addressed group problems when asked	78%	64.54%	> 0.01

### Discussion

Regarding self-perception of learning, PBL is more interesting and enjoyable than lectures. The feeling of satisfaction derived from the act of discovery certainly adds to the enjoyment of learning<sup>8</sup>. Secondly working in a team is beneficial for them and all members of group participated equally. Literature proves that PBL promotes student's interpersonal skills and ability to work as team members<sup>9</sup> and Learning and teaching is more enjoyable for students and teachers. Furthermore

student's mood, class attendance, faculty attitudes, academic process variables has shown supporting

**Table 2: Facilitators response**

Category	SD	D	NC	A	SA
All members of the group participated in discussion equally	18.7	42.7	10.7	25.3	2.7
Working as a team was productive	2.7	17.3	4	62.7	13.3
The use of problem as learning tool facilitated your learning	5.3	14.7	12.0	53.3	14.7
Working in Groups improved understanding of the subject	4.0	18.7	9.3	48.0	20.0
Completing assignments related to PBL problems was easy	16.0	24.0	10.7	38.7	10.7
Using electronic resources, primarily the internet , to find information was easy	5.3	12.0	6.7	50.7	25.3
Library resources, other than electronic ones, were accessible	5.3	28.0	9.3	46.7	10.7
Use of computer as an investigative tool in the laboratory was beneficial	12.0	12.0	8.0	50.7	17.3
Facilitator did not dominate group discussion	5.3	17.3	10.7	57.3	9.3
Facilitator created a supportive group climate	8.0	22.7	5.3	52.0	12.0
Encourage involvement of group members	10.7	12.0	10.7	56.0	10.7
Facilitator kept the group focused on the task	8.0	13.3	20.0	52.0	6.7
Facilitator address group problems when asked	9.3	17.3	6.7	50.7	16.0

Likert Scale: 1=strongly agree(SA), 2=agree(A), 3=uncertain(NC), 4=disagree(D), 5=strongly disagree(SD)  
 \*=agree and strongly agree combined together

**Table 3: Mean score of the students**

Category	Group A	Group B	p- value
Mean score of the students	14.74 ± 2.34	10.64± 1.99	≤ 0.001

results with superiority of PBL over traditional curriculum.<sup>10</sup>Two important aspects applicable to PBL are: first the ability of students to make real assessments of their knowledge needs and secondly the awareness of the presence itself of knowledge gaps motivate students for further self-directed learning<sup>11</sup>. As the learning process advances and more health problems are studied in units to come and beyond in

the curriculum, knowledge and problem-solving skills will certainly increase in both depth and breadth in a spiral fashion, amplifying vertical integration<sup>12</sup>. Most of the students agreed that PBL problems facilitated their learning. The reason behind is that PBL approach is based on adult learning principles<sup>13</sup>. The closer the resemblance between problem and real life situation better would be the performance of students. Most educators have come to believe on the basis of hundreds of less rigorous reports—that, compared with traditional learning, problem based learning has beneficial effects on some psychosocial outcomes of undergraduate medical education. Optimum time for telling is once students have discerned the features and structures that differentiate relevant aspects of the phenomena to be understood. Findings of Schwartz and Bransford support that superior processing of didactic material occurs when a student has first engaged in analyses of pertinent dimensions of the phenomena that are to be explained.<sup>14</sup> Regarding the learning environment most of the participants agreed that it was conducive. A study compared the level of stress in traditional and PBL curriculum, found PBL to be less stressful; learning environment is more stimulating and more humane. Literature showed that ready access to library and computer facility is a necessity for successful PBL.<sup>15</sup> From constructivist perspective role of a facilitator is to guide learning process rather than provide knowledge. The facilitators were in favor of PBL sessions as they thought that class attendance increases and it encourages the students to spend more time in studying. PBL as Literature has also proved that PBL promotes interaction between students and faculty. It is also proven in literature that PBL foster collaborative research, improve the delivery of clinical services and thus itself enhances working requirement<sup>16</sup>. Actually this facilitator role was a challenge for some faculty members because to know how to work with group, asking open- ended questions, maintaining interest and motivation level and how to resolve conflicts in group. All these issue need proper faculty training and this is one of the limitations of PBL. <sup>16</sup>The benefit of problem-based learning lies not in superior acquisition or recall of new concepts but in the potential for greater understanding reflected in an integration of the new concept with existing knowledge, and with it, the possibility of restructuring and enhanced conceptual coherence. Research in this area, shows that students who experience an extended problem-based curriculum exhibit to a greater degree than a control group individual characteristics such as self-

monitoring, self-regulation, planning, a positive orientation toward learning, and satisfaction with the learning process.<sup>17</sup>

The facilitators rated the performance of students with public sector students getting higher scores. This is probably due to the fact that higher achievers get admission in public sector medical colleges. While in private sector medical colleges mostly those students are entertained who do not get admission in public sector medical college.<sup>18</sup>

## Conclusion

1. There is no difference in perception of students in a public and private medical college regarding PBL but there is statistically significant difference in performance of students, public sector students getting higher scores.

2. Students overall achieved satisfactory learning outcomes from PBL methodology.

## References

1. Amelvoort M., Andriessen J, Kanselaar G. Representational tools in computer-supported collaborative argumentation-based learning: How dyads work with constructed and inspected argumentative diagrams. *Journal of the Learning Sciences*.2007; 16: 485–521.
2. Allen DE, Donham RS, Bernhardt SA. Problem-based learning. *New Directions for Teaching and Learning*, 2011; 128: 21–29.
3. Almajeda, Skinner V, Peterson R, Winning T. Collaborative Learning: Students' Perspectives on How Learning Happens. *Interdisciplinary Journal of Problem-Based Learning (IJPBL)*. 2016;10 (2):
4. Wood DF. ABC of learning and teaching in medicine: Problem based learning. *BMJ*. 2003; 326: 328-30
5. Leung W-C. Is PBL better than traditional curriculum? The jury is still out. *Student BMJ*. Sep 2001;9:306-07
6. Allen DE, Donham RS, Bernhardt SA. Problem-based learning. *New Directions for Teaching and Learning*, 2011; 128: 21–29.
7. Pease M and Kuhn D. Experimental analysis of the effective components of problem-based learning. *Science Education*, 2011; 95: 57–86.
8. Hmelo-silver C, Barrows H. goals and strategies of a Problem based learning facilitator. *The Interdisciplinary Journal of Problem-Based Learning*.2006; 1:21-39.
9. Butlet R, Inman D, Lobb D. Problem-based learning and the medical school: another case of the emperor's new clothes. *Adv Physiol Educ* 2005; 29:194-96.
10. Pawson E, Fournier E, Haight M, Muniz O, Trafford, J., and Vajoczki S.. Problem-based learning in geography: Towards a critical assessment of its purposes, benefits and risks. *Journal of Geography in Higher Education* 2006; 30 (1): 103–16.
11. Capon N, Kuhn D. What's so good about problem-based learning? *Cognition and Instruction*.2004; 22: 61–79.
12. Barron B. When smart groups fail. *Journal of the Learning Sciences*, 2003;12: 307–59.
13. Blumbrerg P, Micheal J. Development of self directed learning; behaviour in a partially teacher directed problem-based learning curriculum. *Teach learn Med* 1992; 4: 3-8.
14. Bligh J. Problem based, small group learning. *BMJ*.1995; 311(7001): 342–43.
15. Vernon D, Blake RL. Does problem based learning work? A metanaylysis of evaluative research. *Acad Med*. 1993; 68: 550-63.
16. Schwartz D, Bransford, J. A time for telling. *Cognition and Instruction*, 1998;16: 475–522.
17. Strobel J, Van B A. When is PBL More Effective? A Meta-synthesis of Meta-analyses Comparing PBL to Conventional Classrooms. *Interdisciplinary Journal of Problem-Based Learning*, 2009;3(1): Available at: <http://dx.doi.org/10.7771/1541-5015.1046>
18. Pease MA and Kuhn D. Experimental analysis of the effective components of problem-based learning. *Science Education*, 2011; 95 (1):57-95.