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Research article

**FACULTY PERCEPTION OF PBL CURRICULUM IN MELAKA MANIPAL MEDICAL COLLEGE,
MANIPAL, INDIA**

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ABSTRACT: Present study was carried out to gauge the perception of the faculty members of Melaka Manipal Medical College (MMMC), Manipal, India regarding the problem-based learning (PBL) curriculum. The faculty were divided into those with prior experience of PBL (group A) and those without it (group B) and were asked to respond to a Likert scale questionnaire regarding the PBL curriculum. Majority of the faculty members agreed that PBL curriculum helps students to acquire critical thinking skills and has made them more responsible towards self-study. Majority of the inexperienced faculty members felt that students tend to selectively prepare for certain learning objectives rather than for the entire problem whereas majority of the experienced faculty disagreed ($p < 0.01$). A greater majority of those in group A than group B opined that students initially reluctant to participate in PBL discussions improve their participation over the year ($p < 0.05$). Majority of faculty in group A agreed that student assessment method currently followed in PBL is adequate to grade student involvement in PBL whereas half of those in group B disagreed. Most of the faculty members in both groups felt that the present PBL-lecture hybrid system is better than the entirely lecture-based curriculum. Most faculty in group B would like more PBL sessions to be introduced whereas most of those in group A disagreed. A good number in both groups felt that greater integration of the different disciplines in PBL is desirable.

Key words: Problem Based Learning (PBL), curriculum, faculty, perception

INTRODUCTION

Problem-based learning (PBL) was initiated in the 1960s at the McMaster University's School of Medicine, Canada and is now widely adopted in medical curricula in many countries (Butler R et al, 2005). PBL is an instructional method in which students use 'triggers' from clinical scenarios to define their own learning objectives and perform independent research, the findings of which are refined in group discussions (Wood DF, 2003). Knowledge is thus acquired in an active and self-directed way, unconstrained by subject divisions (Maudsley G, 1999). Nevertheless, PBL is still to become part of the curriculum in most Indian medical schools. Melaka Manipal Medical College (MMMC), Manipal conducts a twin campus MBBS program in which students undergo training in basic sciences (Phase I) for the first two and a half years in the Manipal campus in India and continue their clinical training (Phase II) for the next two and half years in Melaka, Malaysia. The MBBS degree is awarded by Manipal University. The curriculum followed is a hybrid of didactic lectures with self-directed learning strategies including PBL. PBL was introduced for the Phase I students of MMMC, Manipal in the year 2006 and covers about 10% of the course content. Students go through 12 problems over the period of one year with three problems per teaching units known as blocks. Students brainstorm a problem in groups of 12 or 13 and come out with learning objectives. One week later, they present the learning objectives and both the brainstorming and presentation sessions are moderated by a faculty member serving as a facilitator. The facilitators assess the student involvement in the PBL sessions based on brainstorming, participation and presentation by giving scores out of five which counts for internal assessment marks. Some of the senior faculty members had a prior experience of PBL under the University of West Indies (UWI) twinning program with Manipal University for about five years whereas most of the junior faculty members had no prior training in PBL. Serving as a PBL facilitator or tutor is a study in patience and being able to resist the urge to be 'the sage on the stage' rather than 'a guide by the side.

The objective of the present study was to gauge the perception of the faculty members of MMMC, Manipal regarding the PBL curriculum contrasting the views of faculty members with experience in PBL with those of new faculty members inexperienced in PBL.

STUDY SUBJECTS AND METHODS

The faculty members of Melaka Manipal Medical College, Manipal served as the study subjects. The faculty members were divided into two groups, those with prior experience of PBL (Group A, n = 15) and those without prior experience of PBL (Group B, n = 20). In order to assess their perception of PBL curriculum, faculty members were requested to respond to a questionnaire in the five-point Likert scale format comprising strongly agree (5), Agree (4), Uncertain (3), Disagree (2) and Strongly disagree (1) responses for each question (Appendix 1). The questionnaire was validated by experts and the consent was obtained from the participants in the study. The completed questionnaires were collected and the answers were analyzed. Prism statistical software package was used to analyze the results and the values for each question were expressed as mean \pm SEM. A p value less than 0.05 was considered as statistically significant when comparing the means of the two groups using unpaired t test.

Appendix 1

FACULTY PERCEPTION OF PBL CURRICULUM IN MMMC

Dear colleague

Please take time to respond to the following questions regarding your perception of the PBL curriculum being followed in MMMC, Manipal. Circle the number that most closely corresponds to your views about each of the following statements. Be aware that by responding to the questions you are consenting to participate in the study and allowing me to publish the results. Your responses are anonymous and confidential. I appreciate your assistance with this evaluation

Dr. Guruprasad Rao

Were you exposed to PBL before it was introduced for Melaka program students: yes/ no

Would you prefer to have an orientation to PBL before attending PBL sessions: yes / no

		Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1	PBL helps students acquire critical thinking skills	5	4	3	2	1
2	Makes students more responsible towards self-study	5	4	3	2	1
3	Students tend to selectively prepare for certain learning objectives rather than for all the objectives	5	4	3	2	1
4	Students initially reluctant to participate in the PBL discussions have increased their participation over the year	5	4	3	2	1
5	Student assessment method currently followed in PBL is adequate to grade student involvement in PBL	5	4	3	2	1
6	I found it difficult to adjust to PBL from the traditional lecture-based curriculum	5	4	3	2	1
7	I am able to design problems to adequately address important subject areas	5	4	3	2	1

8	Would like to see more PBL sessions introduced	5	4	3	2	1
9	Would like to have PBL with greater integration of disciplines	5	4	3	2	1
10	Current PBL-lecture hybrid system is better than the entirely lecture-based curriculum	5	4	3	2	1
11	In examinations, students tend to					
	a. perform better in topics covered only in PBL as compared to those covered in lectures	5	4	3	2	1
	b. perform worse in topics covered only in PBL as compared to those covered in lectures	5	4	3	2	1
12	After introduction of PBL, overall performance of students					
	a. Has improved	5	4	3	2	1
	b. Has worsened	5	4	3	2	1

RESULTS

A majority of faculty members of MMMC, Manipal in both the groups agreed that PBL is helping students acquire critical thinking skills and also that PBL has made students more responsible towards self-study (Table 1). There was no significant difference between the two groups on these questions. Majority of faculty members in group B felt that students tend to selectively prepare for certain learning objectives rather than prepare for all the objectives whereas most of the faculty members in groups A disagreed (Table 1). There was a statistically significant difference between the means of these two groups for this question ($p < 0.01$, Table 3). A greater majority of those in group A than group B opined that students initially reluctant to participate in PBL discussions have increased their participation over the year (Table 1). There was a significant difference between the means of the two groups regarding this question ($p < 0.05$, Table 3). Majority of the members in group A felt that student assessment method currently followed in PBL is adequate to grade student involvement in PBL whereas half of those in group B disagreed (Table 1). Though the means of the two groups for this question were considerably different, there was no statistical significance for the difference (Table 3). Majority of the faculty members in group B were in favour of having an orientation to PBL before attending PBL sessions. A great majority of the members in both the groups reported no difficulty in adjusting to a PBL curriculum from a lecture-based curriculum (Table 2). Majority of the members in both groups were confident about their ability to design problems to adequately address important subject areas though the percentages were greater for group A (Table 2). Most of the faculty members in both groups think that the current PBL-lecture hybrid curriculum is better than the entirely lecture-based curriculum (Table 2). A majority of the members in group B wanted more PBL sessions to be introduced whereas a majority of those in group A did not support such an idea (Table 2) and means for the two groups for this question differed considerably though not statistically significant (Table 3). A good number in both groups however feel that greater integration of the different disciplines in PBL is desirable (Table 2). Majority of faculty in group A (60%) and group B (70%) were uncertain regarding whether students tend to perform better in examinations in topics covered only in PBL as compared to those covered in lectures. Though 46% of the respondents in group A did not think that students performed worse in topics covered only in PBL, 40% of the respondents were uncertain about it. Majority (55%) of the respondents in group B were uncertain whether students performed worse in topics covered only in PBL.

When asked whether the overall performance of students has changed after the introduction of PBL, most of the faculty in group A felt that it has improved (47%) and no one felt that it has worsened. However, majority of members in group B were uncertain (55%) regarding this question.

Table 1: Faculty perception of student participation in PBL and its impact on their learning

Question	Group	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. PBL helps students acquire critical thinking skills	Group A	3 (20)	8 (53)	3 (20)	1 (7)	0
	Group B	4 (20)	10 (50)	5 (25)	0	1 (5)
2. PBL makes students more responsible towards self-study	Group A	5 (33)	5 (33)	5 (33)	0	0
	Group B	4 (20)	11 (55)	2 (10)	2 (10)	1 (5)
3. Students tend to selectively prepare for certain learning objectives in PBL	Group A	1 (7)	4 (27)	3 (20)	5 (33)	2 (13)
	Group B	6 (30)	10 (50)	2 (10)	2 (10)	0
4. Student participation in PBL discussions improves over the year	Group A	3 (20)	10 (67)	2 (13)	0	0
	Group B	2 (10)	9 (45)	6 (30)	3 (15)	0
5. Student assessment method currently followed in PBL is adequate to grade student involvement in PBL	Group A	1 (7)	9 (60)	2 (13)	2 (13)	1 (7)
	Group B	1 (5)	6 (30)	3 (15)	7 (35)	3 (15)

Group A: faculty with prior experience of PBL (n=15)

Group B: faculty without prior experience of PBL (n=20)

Values in parentheses are percentages

Table 2: Faculty perception of implementation of PBL curriculum in MMMC, Manipal

Question	Group	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
6. I found it difficult to adjust to PBL from the traditional lecture-based curriculum	Group A	1 (6.5)	1 (6.5)	0	7 (47)	6 (40)
	Group B	1 (5)	1 (5)	0	9 (45)	9 (45)
7. I am able to design problems to adequately address important areas in my discipline	Group A	5 (33)	9 (60)	0	1 (7)	0
	Group B	4 (20)	11 (55)	2 (10)	2 (10)	1 (5)
8. More PBL sessions need to be introduced	Group A	3 (20)	2 (13)	2 (13)	4 (27)	4 (27)
	Group B	5 (25)	7 (35)	3 (15)	4 (20)	1 (5)
9. Greater integration of disciplines is needed in PBL	Group A	6 (40)	5 (33)	1 (7)	2 (13)	1 (7)
	Group B	10 (50)	5 (25)	5 (25)	0	0
10. PBL-lecture hybrid system is better than entirely lecture-based curriculum	Group A	6 (40)	4 (27)	3 (20)	2 (13)	0
	Group B	7 (35)	7 (35)	2 (10)	3 (15)	1 (5)

Group A: faculty with prior experience of PBL (n=15)

Group B: faculty without prior experience of PBL (n=20)

Values in parentheses are percentages

Table 3: Comparison of mean values \pm SEM of some of the responses of two groups of faculty to questions

Question	Group A	Group B	p value (unpaired t test)
Students tend to selectively prepare for certain learning objectives in PBL	2.8 \pm 0.31	4 \pm 0.2	<0.01
Student participation in PBL discussions improves over the year	4.06 \pm 0.15	3.5 \pm 0.2	<0.05
Student assessment method currently followed in PBL is adequate to grade student involvement in PBL	3.47 \pm 0.27	2.75 \pm 0.27	0.07 (n.s)
More PBL sessions need to be introduced	2.73 \pm 0.4	3.55 \pm 0.28	0.09 (n.s)

Group A: faculty with prior experience of PBL (n=15)

Group B: faculty without prior experience of PBL (n=20)

n.s = not statistically significant

DISCUSSION

PBL is being increasingly favoured by medical educationalists. A study showed more PBL graduates than non-PBL graduates indicated that they had learned profession-specific methods, communication skills and teamwork in medical school (Prince KJ et al, 2005). In our study, majority of faculty both with and without prior experience of PBL agreed that PBL helps students acquire critical thinking skills and that PBL has made students more responsible towards self-study. Inexperienced faculty members felt that students tend to selectively prepare for certain learning objectives rather than for all the objectives during the presentation, an opinion not shared by their more experienced colleagues. It has been reported earlier that in peer-facilitated groups, students sometimes took short cuts in the PBL process that may undermine some of the intended goals of PBL (Steele DJ et al, 2000). Inexperienced PBL facilitators in our institution may have felt that students are taking a short cut during presentations, whereas experienced facilitators do not feel that way possibly because they know a better way to handle such issues. This suggests that more training needed for new faculty in getting acclimatized to handling the challenges during conduct of PBL. A study from another Indian medical college suggested that a workshop focused on developing facilitator skills would be essential to enable faculty to emerge as facilitators of group learning rather than providers of information (Pandya H and Ghosh S, 2008). A study in Nepal reported that a PBL training workshop was highly beneficial to inculcate new competencies in PBL in the faculty (Baral N et al, 2010). PBL tutors in Dalhousie University, Canada expressed a need for further training in group facilitation, questioning and evaluating students (Kaufman DM and Holmes DB, 1996). Most of the inexperienced faculty members in our study were in favour of having an orientation to PBL before attending PBL sessions. The institution has now introduced an orientation to PBL process to students as well as new faculty using a video demonstration (Abraham R et al, 2011). Greater number of experienced faculty than inexperienced ones felt that students initially reluctant to participate in the PBL discussions have increased their participation over the year. This could be due to the ability of experienced faculty in motivating students to participate more through various approaches which the new faculty will need to adopt. A study in our institution reported that student scores in brainstorming, active participation and presentation during PBL improved as they progressed from the first PBL to the third during the year suggesting improved communication skills, constructive thinking and greater familiarity with the PBL process (KL Shobha and Pallath V, 2011). The student participation in the PBL process in our institution was being assessed by giving scores out of five. The inexperienced PBL facilitators were less supportive of this method than the experienced ones. Assigning numbers to complex behaviors such as group dynamics in PBL sessions may be counterproductive to cooperative group learning (Bollela VR et al, 2009). Subsequently MMMC, Manipal adopted a new system of student assessment in PBL based on awarding of grades for brainstorming, presentation, active participation and content coverage based on objectives (KL Shobha and Pallath V, 2011). Majority of the faculty members in both the groups reported no difficulty in adjusting to a PBL curriculum from a traditional lecture-based curriculum and were confident about their ability to design problems to adequately address important subject areas though understandably the experienced faculty were more comfortable with designing problems. Most of the faculty in both the groups perceived the present PBL-lecture hybrid curriculum to be better than the traditional lecture-based curriculum. Earlier studies have reported varying opinions regarding the effectiveness of PBL based curricula. Nursing students educated through PBL reportedly had higher conflict resolution skill scores (including empathy, listening skills) than those in non-PBL schools (Seren S and Ustun B, 2008).

PBL tutors from different U.S & Canadian medical schools evaluated PBL more positively than traditional methods in the ratings of student interest and enthusiasm, reasoning and preparation for clinical rotations. However, traditional methods were judged to be superior for teaching factual knowledge of basic sciences (Vernon DT, 1995). PBL curriculum resulted in better performances in USMLE & improved evaluations from residency program directors for University of Missouri-Columbia students (Hoffman K et al, 2006). Older studies say that PBL students do less well in basic science exams, better in clinical exams and do backward reasoning (from clinical information to theory) and show gaps in knowledge (Albanese MA, Mitchell S, 1993). Performance of PBL and conventional graduates in Medical Council of Canada qualifying examinations were reported to be similar (Kaufman DM and Mann KV, 1999). There was no evidence that PBL graduates were better than conventional graduates in performance outcome (McMaster and other graduates) (Norman GR et al, 2008). No difference in clinical competence and research were found between PBL and conventional graduates in Netherlands (Cohen schotanus J, 2008).

Majority of the newer faculty members at MMMC, Manipal support the idea of incorporating more PBL sessions but this feeling is not shared by their more experienced colleagues. In an institution like ours with two intakes of MBBS students per year and annual admissions for BDS and allied health science courses, it will be a challenge to incorporate more PBL sessions in view of the packed schedule of faculty. An earlier study in our institution revealed that majority of students were not in favour of introducing more PBL sessions either (Roche M & Abraham RR, 2010). Similar opinion was voiced by the authors of a study on comparing PBL and traditional curriculum in another Indian medical school (Mane Manisha et al, 2012). A study in a medical school in Pakistan revealed that senior faculty were less enthusiastic than junior faculty towards implementation of PBL-based curriculum (Usmani A et al, 2011). However, greater integration of disciplines in PBLs was desired by all the faculty members in our study.

Majority of both experienced and inexperienced faculty were uncertain regarding whether students performed better or worse in examinations in topics covered only in PBL and not in lectures. This aspect needs to be looked into and a study is in progress to compare the scores of students in examinations on topics covered only in PBL as opposed to those covered in lectures. Most of the experienced faculty felt that the overall performance of students has improved after the introduction of PBL whereas majority of the inexperienced faculty were uncertain about this question. A later study reported that the success rate of students in the university examinations in our institution improved subsequent to adoption of PBL (Abraham RR et al, 2012).

In conclusion, most of the teachers in MMMC, Manipal opined that PBL is encouraging development of critical thinking skills, self-study and group participation among medical students. Faculty with less experience of being PBL facilitators felt that students tend to do selective preparation for certain learning objectives, PBL assessment being followed is inadequate and that more PBL sessions should be introduced. In general most faculty members are confident about their problem-designing ability, prefer to see greater interdisciplinary integration in PBL and are more supportive of the present PBL-lecture hybrid curriculum than the earlier lecture-based curriculum. Most of the experienced faculty felt that the overall performance of students has improved after the introduction of PBL in MMMC, Manipal. Further studies may elucidate whether students actually understand topics covered in PBL better than those covered in lectures and whether PBL is achieving its goal of making students of MMMC, Manipal lifelong learners.

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