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Perceptions of faculty and students regarding Problem Based Learning: A mixed methods study

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Abstract

Objectives: To determine perception of faculty and students regarding problem-based learning.

Methods: The study was conducted at Northern Border University, Arar, Kingdom of Saudi Arabia, from May 21to November 21, 2014. Data was collected on a structured close-ended questionnaire from faculty members. Application of problem-based learning by the faculty was assessed through observations of first such session of medical students. Observations were recorded on a structured checklist. Perceptions of students about learning methodology were determined through focused group discussion which was audio-taped and transcribed. Qualitative data was analysed through content analysis and quantitative data through SPSS 16.

Results: Of the 60 faculty members, 44(73%) took part in the study. Of them, 35(79.5%) were males and 9(20.5) were females. There were 23(52%) assistant professors and 31(70.45%) were trained in problem-based learning. Overall, 22(50%) faculty members thought that it was better than lecture-based learning; and 32(72.7%) stated that they conducted problem-based learning in classic seven jumps. In focus group discussions, students appreciated learning subject content but could not identify other benefits of problem-based learning.

Conclusions: Faculty still had to come to terms with application of problem-based learning methodology.

Keywords: PBL, Faculty development, Facilitator, Mixed methods. (JPMA 65: 1334; 2015)

Introduction

The deficiencies perceived in traditional methods of teaching and learning has led to development and implementation of more effective methods appropriate to a given situation. One such method is problem-based learning (PBL), which is more active and participatory in nature.[1] PBL is an innovative instructional strategy introduced at Canada's McMaster University in 1969.[2] This methodology has the ability to incorporate curricular philosophy. In its 1993 document, 'Tomorrow's Doctors', the General Medical Council (GMC) urged medical schools in the United Kingdom to make curricular changes, with the result that several British medical schools have adopted the PBL pathway.[3]

PBL is the most effective method of improving knowledge, attitude and skills.[4] PBL tutorials are conducted in several ways. Traditionally, these are modelled on the Maastricht "seven jump" process.[5] Benefits of PBL cannot be denied, but they can only be achieved if it is executed through trained faculty. Therefore, it is of paramount importance to ensure that a trained faculty is available to facilitate this instructional strategy.

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The current study was planned to explore the perceptions of faculty and students about PBL.

Subjects and Methods

The study was conducted at the Faculty of Medicine, Northern Border University, Arar, Kingdom of Saudi Arabia, from May 21to November 21, 2014. The university follows student-centered, problem-based, integrated, community-oriented, elective and systematic (SPICES[6,7]) modular curriculum, which is a six-year curriculum in which first year is the basic foundation year.

For this study, a mixed methods equential explanatory design[8] was selected. In this method, quantitative data collection is followed by qualitative data collection. We selected this design to gather data by multiple techniques for better understanding of faculty's perception regarding PBL. Quantitative data was collected from the faculty members on a structured close-ended 5-point Likert scale questionnaire. Likert scale rating was designed on traditional strongly disagree-strongly agree continuum.

The questionnaire was designed after thorough literature review[9-11] and on the basis of expert opinion of three professors in the field of PBL.

Then conveniently available 1st PBL session of 2nd, 3rd, 4th and 5th year MBBS were attended to observe the application of PBL by the faculty members. First year MBBS students were excluded as they were not exposed

to PBL. These four sessions of those faculty members were selected who claimed that they were trained in PBL and were conveniently available. These observations were recorded on a structured checklist form which was developed after thorough literature[9-11] search and on expert opinion of three professors in the field of PBL.

To assess students' perception of PBL, focused group discussions (FGDs) were conducted at the end of the same PBL session once their tutor had left the class. Questions were asked and the students were encouraged to talk freely about their experience of PBL. They were asked for further elaboration of their statements, when needed. FGDs continued till the saturation of data. These discussions were audio-taped and transcribed.

Informed consent was taken from all participants and confidentiality of data was assured. Ethical approval was obtained from the institutional review board.

Quantitative data was analysed through SPSS 16. To create more meaningful categories, data of "agree" and "strongly agree" categories was combined to obtain the percentage of agreement, and the "disagree" and "strongly disagree" categories were combined for the percentage disagreement.

Observational data of four PBL sessions were obtained on checklists and presented in percentages.

Students' FGDs were processed for content analysis.[12] A thematic analysis extracted key themes pertaining to objectives of the study by grouping words, phrases and statements of similar meanings into categories.

Results of quantitative and qualitative data were integrated in the interpretation phase to draw conclusions.

Results

Of the 60 faculty members, 44(73%) took part in the study. Of them, 35(79.5%) were males and 9(20.5) were females. There were 23(52%) assistant professors, 8(18%) associate professors, 7(16%) professors, and 6(14%) lecturers. Overall, 31(70.45%) were trained in PBL. Further, 22(50%) faculty members thought that it was better than lecture-based learning; 36(81.8%) were satisfied with PBL; 30(68.2%) confirmed they gave feedback to the students and 32(72.7%) stated that they conducted PBL in classic seven jumps (Table-1)

In filing their responses, 28(63.6%) faculty members said PBL process is conducted on flip chart or white boards (Figure).

Findings of the observations off our PBL sessions were recorded separately (Table-2).

FGDs were conducted with 2nd, 3rd, 4th and 5th year students to further validate findings of quantitative

Table-1: Perceptions of faculty about PBL.

S.N.	Domain	Disagree n (%)	Neutral n (%)	Agree n (%)
1	PBL has no effect on attitude	32 (72.7)	8 (18.2)	4 (9)
2	PBL develops critical thinking	0 (0)	5 (11.4)	39 (88.6)
3	PBL has longer retention memory	4 (9.1)	10 (22.7)	30 (68.2)
4	PBL develops Self Directed Learning (SDL)	2 (4.5)	7 (15.9)	35 (79.5)
5	SDL means students take responsibility of their learning	5 (11.4)	6 (13.6)	33 (75)
6	PBL develops teamwork	1 (2.3)	3 (6.8)	40 (90.9)
7	PBL develops communication	0 (0)	0 (0)	44 (100)
8	In PBL memorization of content is more important than understanding	32 (72.7)	7 (15.9)	5 (11.4)
9	PBL develops time management skills	2 (4.6)	4 (9.1)	38 (86.4)
10	I am trained in PBL	9 (20.45)	4(9)	31(70.45)
11	I need more training	7(15.9)	11(25)	26(59)
12	PBL is better than lectures	9(20.45)	16(36.4)	19(43.2)
13	PBL should be continued	0(0)	5(11.4)	39(88.6)
14	PBL scenarios are developed by team of faculty members	6(13.6)	12(27.3)	19(43.2)
15	PBL scenarios are discussed among faculty members before presenting to students	16(36.4)	4(9)	24(54.5)
16	PBL scenarios are accompanied by written objectives	8(18.2)	3(6.8)	33(75)
17	I read out PBL scenario for students	22(50)	6(13.6)	16(36.4)
18	I nominate group leader for each PBL session	4(9)	4(9)	36(81.8)
19	I nominate scriber for each PBL session	9(18)	2(4.5)	33(75)
20	I explain difficult terms for students	7(15.9)	1(2.3)	36(81.8)

PBL: Problem-based learning.

Table-2: Observations, findings of the four PBL sessions.

S.No.	Observation	Frequency n (%)
1	Students themselves read scenario	4(100)
2	Scriber and group leader are nominated for the session	1(25)
3	Students are sitting in " C " shape arrangements	0(0)
4	Teacher speaks more than students	0(0)
5	All students are participating in discussion	1(25)
6	Scriber writing discussion points on board/chart	1(25)
7	Group leader engaging all members of PBL in discussion	1(0)
8	Teacher is bringing students back to tract through guiding questioning if distracted	4(100)
9	Students themselves identify learning objectives of PBL scenario	2(50)
10	Teacher is mini lecturing	0(0)
11	steps of PBL are properly following	0(0)
12	Students express their point of view by hand raising and without interrupting other student's point of view	1(25)
13	Teacher is controlling the dominant student	0(0)
14	Teacher is encouraging a quite student to participate in discussion	2(50)
15	Teacher is marking students for their participation in session and taking note of their performance	0(0)
16	Group leader assigns task for self study among the students for next session	0(0)
17	Teacher ensures that students have no doubt about their task for self study	0(0)
18	Teacher interest in feedback on students' performance	0(0)

PBL: Problem-based learning.

analysis. Each FGD had 12 students, and of the total 48 students, 24(50%) were male. One FGD session lasted 30-40 minutes. Content analysis led to consolidated themes.

Students were asked to enumerate benefits of PBL. They appreciated learning the subject content only and remarked PBL was an interesting way to learn. "We learn how to participate with other students in group" but they could not identify other benefits of PBL.

Students also realised the importance of lecture: "Lectures help us learn the basic information to participate in PBL"(4th year male student) but they preferred PBL: "PBL is more interesting than lecture because we have to search and read about the topic at home and then in the next session we discuss topic with our friend so we remember well" (5th year female student).

A student took PBL as a positive competitive environment for learning: "There is competition between the students, so students prepare better."Students were aware of the cognitive benefits of PBL. A student of 3rd year said: "In PBL we learn by searching and discussions". Another group of students of 4th year mentioned benefits of PBLS as: "to discuss together to solve problem." Some students were having different opinion: "We learn more in lectures because everything is explained by the teacher."

Regarding identification of learning objectives of the PBL session one student stated: "We identify our learning objectives, but we ask the teacher to show us objectives to compare." Another group of students also admitted lack of brainstorming in their PBL session: "teacher tells us the objectives."And "teacher clarifies difficult words."

None of the students were familiar with the term "group dynamics."

All students thought that self-directed learning means "learn by ourselves." There was lack of uniformity regarding task distribution in PBL. One student stated: "After PBL session, no distribution of topics/sub-topics (is done) and all students prepare complete topic". Another student remarked: "Some group distributes sub-topics but our group prepares complete topic."

Responding to the question about teacher's role in PBL, a 3rd year student commented: "just sits down and smile." Many students felt presence of teacher in PBL session as a readymade help: "During PBL if we do not understand some information, then the teacher explains that."

Students felt the need for some kind of PBL training: "We need this, of course, because we want to know how to discuss." They also stressed on guidance programme for teachers. "We need a guide on PBL for the teachers because each doctor has a different way for the PBL. Some teachers give us objectives and some let us discuss the problems." A group of students expressed ignorance about PBL: "We need training as nothing is clear to us about PBL." While responding to a question about the need of training in PBL, 4th year students also stressed on

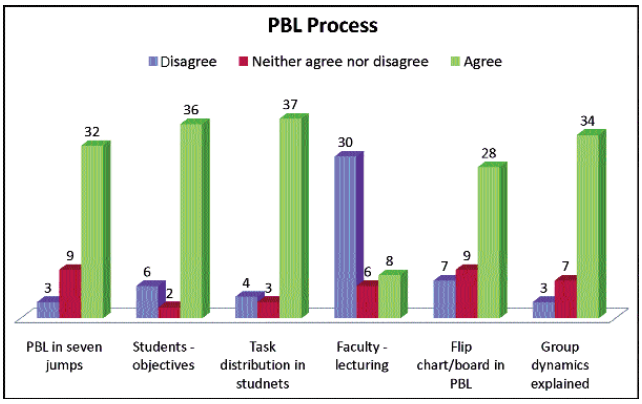

Figure: Faculty response to Problem-based learning (PBL) process.

timing of training: "It is important in 1st and 2nd year to attend some introductory lecture on PBL and not in later years."

Students said that teachers do not give them feedback: "Teacher does not tell us anything." They were well aware of the significance of feedback: "We need feedback. If we perform badly, with feedback we can improve our performance."

A 3rd year student also stressed on reinforcement of his positive performance through feedback: "I need feedback on good things because I know my bad performance and this feedback on my good performance is important to stimulate me for the next session."

Few students were aware of the role of group leader in PBL. "Group leader has a role to make sure that everyone participates in the discussion" but the term scriber was new to all students: "I hear this word for the first time" (5th year student).

Students were not very clear about assessment in PBL: "Some teachers take some notes when we are discussing" (4thyear student).

Discussion

We explored the perceptions of both the faculty as well as the students about PBL. Most of faculty members had sound knowledge of PBL, but during the observation part of the study, they could not demonstrate adequate application of PBL knowledge. For example, 30(68%) faculty members claimed feedback practices, but it was not visible during observation. Interestingly, similar findings were reported earlier. "Faculty members think that they provide regular and effective feedback, but students often complain about not receiving enough feedback."[13] Our students also expressed the need of positive feedback in FGDs.

Besides, 33(75%) faculty members stated that they appoint scriber for each PBL session, but it was not observed.

The teacher facilitates learning process rather than to provide knowledge[11] but 36(81.8%) faculty members admitted that they explain difficult words for the student. Eight (18.18%) faculty members confirmed that they delivered mini-lecture and the same was stated by the students in FGDs that teacher explains for them which is contrary to the basic philosophy of PBL. However, none of the tutors delivered mini-lectures during observation which may be due to their conscious awareness of being observed.

PBL emphasizes that learners should actively construct knowledge in collaborative groups.[7] Students in our study appreciated that they learn through participation in groups and the same has been reflected by the students in a study.[14]

The facilitator helps students to learn to collaborate well.[7,15] But unfortunately none of the students in our study was familiar with the term "group dynamics", while 34(77.3%) faculty members responded that they explain group dynamics to their students which shows lack of application of PBL knowledge on the part of the faculty.

PBL group function relies heavily on several factors; one of them is group dynamics.[16] During observation part of the study it was noticed that none of the facilitators explained ground rules and group dynamics to the student, and, as a result, many students were talking at the same time and even interrupting each other without permission. Setting ground rules is the core value of effective group discussion.[17]

Further, 39(88.6%) faculty members stated that PBL should be continued in contrast to 46.2% in an earlier study[16] which shows that our faculty was highly motivated towards PBL. However, it requires rigorous planning, faculty training and, most importantly, commitment and proper understanding of the philosophy behind its implementation.[10,18] One study reported that 83.9% faculty was in favour of implementation of PBL than traditional teaching.[11] Their findings match our results.

Through PBL, students learn how to use an iterative process of assessing what they know, identifying what they need to know, gathering information and collaborating on the evaluation of hypotheses in light of the data.[19] But we observed and it was later mentioned by

the students as well that teacher explains what the students do not know without giving them the opportunity to think and brainstorm.

In our faculty, 26(59%) felt the need for further training and most of our students thought that teachers should be trained to eliminate discrepancy in their styles of instruction. They even desired for some orientation lecture/training on PBL to get it more beneficial for themselves.

One study[20] reported that PBL improves students' knowledge and critical thinking abilities. In another study, 84% students perceived that PBL had improved their attendance.[21] Our students were aware of few benefits of PBL, but they could not discuss many other benefits like time management, critical thinking development, teamwork and communication ethics that further support the stance of students that they need some training and orientation regarding PBL.

In terms of limitations, the study did not pilot-test the questionnaire and the checklist.

Conclusions

The faculty had basic theoretical knowledge of PBL in the quantitative phase, but the qualitative phase depicted their inability to apply the PBL philosophy adequately. They could not communicate to students to play their roles. Students did not display impressive group dynamics, communication skills and collaborative learning. The faculty needed hands-on PBL training for its successful application. Although students were aware of some benefits of PBL, but they also required training to get maximum benefit from the PBL curriculum.

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