

## Challenges and Opportunities Offered by PBL: Students' and Facilitators' Perspectives

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### Abstract

This paper aims at offering solutions to student's concerns regarding PBL and to highlight the scope of PBL in filling up the knowledge gaps in the curriculum.

Feedback received from MBBS students completing their preclinical phase of training over the last three years was analysed. Feedback included student opinion and suggestions regarding the course, curriculum, teaching learning methods and assessment. Students who were PBL group leaders during their preclinical phase were called in for a focus group discussion with facilitators who were experienced in PBL formulation and facilitation. Subtopics discussed ranged from scheduling of tutorials, punctuality, availability of suitable venues and facilities, role of the facilitator, group dynamics especially the non-participation of certain students. The repetition of learning outcomes in different PBL's and the PBL assessment pattern were also discussed. Solutions suggested included orientation of students, training and briefing facilitators, shuffling of PBL groups and vetting of the PBL material. The students volunteered to simulate and record an ideally and a poorly conducted PBL session. These sessions could be used to orient the new students and faculty to PBL facilitation. The overall objectives of the course and the intended specific learning outcomes of each trigger are key factors to develop PBL into a valuable tool for filling up the knowledge gaps in any curriculum in an active learner driven environment.

### Introduction

The Faculty of Medicine at the Asian Institute of Medical, Science and Technology (AIMST University) follows an integrated curriculum with PBL being used as a teaching learning method. Year 2 of the course at AIMST deals with systems, namely the Cardiovascular system, Respiratory system, Gastrointestinal system, Central Nervous system, Endocrine and Reproductive system and the Renal and Hematology systems.

The PBL case is formulated by the PBL core group along with the respective system coordinators and invited subject experts, with the objective of reinforcing and achieving the overall system learning outcomes. A typical PBL tutorial in Year 2 constitutes three contact sessions of 2 hours each. The tutorial is followed up by a review session of one hour where the subject experts answer the student queries to fill up the gaps in knowledge.

### Objective

This paper aims to review the challenges and opportunities offered by PBL considering the students and facilitators perspectives with the objective of highlighting the scope of PBL in filling up the knowledge gaps in the curriculum.

### Methods

Feedback received from MBBS students completing their preclinical phase of training over the last three years was analyzed. Feedback included student opinion and suggestions regarding the course, curriculum, teaching learning methods and assessment.

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Students who had cleared their preclinical phase and were PBL group leaders at least once were called in for a focus group discussion (Lew & Schmidt, 2006) with facilitators who were experienced in PBL formulation and facilitation to discuss these problems and the possible solutions. The focus group met on eight occasions to brainstorm on different aspects of the PBL. The dual moderator approach was used in six of the sessions and the duelling moderator approach in two of the sessions. Dual moderator approach involves two moderators, one to ensure smooth progression of the session, while the other moderator makes sure that all topics are covered. Duelling moderator sessions are sessions where the moderators played the devil's advocate to ensure all aspects of the problems are covered and looked up at all angles.

### Results of the focus group interviews

Student concerns ranged from improper PBL scheduling, where the time between sessions one and two made achievement of learning outcomes unreasonable, and the process threatening (Steinert, 2004), student's walking in late for PBL, dominant role adopted by certain facilitators who deliver mini lectures on their specialty subject, bad group dynamics especially the non-participation of certain students, the repetition of learning outcomes in different PBL's and the vague PBL assessment pattern. Solutions suggested included orientation of students to the PBL process, formal training for all facilitators (Wilkerson & Irby, 1998), briefing sessions before each PBL tutorial for respective facilitators which would reinforce their training and ensure uniform facilitation, shuffling of PBL groups to ensure the students do not find themselves in the same group or with the same facilitator (Hitchcock & Anderson, 1997) and detailed vetting of the PBL material by the core group and invited subject experts.

To avoid the ill effects certain groups suffer because of the facilitator donning the expert's cap and not doing justice to the entire PBL, a review plenary session attended by all groups and all facilitators is held. In the plenary other groups are encouraged to answer questions raised by a specific group. The subject expert offers his opinion only if none of the groups could answer a core issue.

### Discussion on solutions

The points of concerns raised by the students were accepted by the facilitators and resulted in setting up some solutions.

A core group of faculty members experienced in PBL along with the respective system coordinators and invited subject/content experts vetted the PBL content.

After the content and triggers were finalized, the prospective facilitators of the sessions were briefed. Suggestions from the facilitators were incorporated into the PBL. Facilitator's notes were drafted to ensure uniform standardized approach by all facilitators. It was stressed that the notes were only for the facilitator's use.

PBLs were slotted between 8-10 am on Tuesdays and Thursdays in the master time table. The first PBL tutorial had lesser outcomes to achieve, to ensure that it was feasible to attain by Thursday. The second session's outcomes were to be presented only on the next Tuesday, and the third session had a post PBL exercise, involving a closely related topic, for which the students should apply the prior knowledge to solve. This was to assess if the students have taken home the principles.

The PBL Assessment was standardized. (Sluijsmans *et al.*, 2001). For each system, the two PBL tutorials were allotted 10 marks each. Attendance in each session (including the review session) fetched 0.5 marks to a total of 2 marks per PBL. For the students' participation in each of the PBL tutorial 1 mark was awarded for each session, totalling 3 marks per PBL and 5 marks was ear marked for the assessment of outcomes presentation.

Apart from this, a PBL paper assesses the students on the two PBL case scenarios.

A sample from Respiratory system PBL assessment from PBLs on Pleural effusion and Bronchial asthma is given in Table 1.

Thus the PBLs Evaluation Scheme includes

- Attendance/Punctuality:  
2 marks per PBL (0.5 per session)
- Participation (including communication skills):  
3 marks per PBL
- Learning outcomes (Handwritten assignment):  
5 marks per PBL
- Total: 10 marks

As each system in Year 2 has two assessable PBLs, the PBL tutorial will be marked as recommended above to a total mark of 20. Additionally a PBL based question will be included along with the CA theory paper to a total of 15 marks. The total marks obtained in PBL (inclusive of 2 PBLs and the marks from

the PBL theory question- 10+10+15=35) will be scaled to be determined out of 6 marks. A social seating map with the students sitting in the same pattern was established to ensure the facilitators can easily observe and document

their cooperation, attitude and interactions during sessions. (Rajesh, *et al.*, 2010). With these in place, we feel we have done justice in addressing the focus groups concerns.

**Table 1: Respiratory system PBL assessment from PBLs on Pleural effusion and Bronchial asthma**

<b>Max. Marks</b>	<b>15</b>	<b>BATCH 18 YEAR 2 TERM 1 MBBS MRES PROBLEM BASED LEARNING EXERCISE</b>	<b>Index No:</b>
<b>Time (min)</b>	<b>20</b>		
<b>Date: 08.11.2013, Friday (11.00 – 11.20 am)</b>			<b>Seat No:</b>
<b>Key Feature Question (Total: 7 Marks)</b>			
Q1.	A 40 year old male was brought to the emergency department with severe breathlessness. On examination the medical officer noted the patient was in respiratory distress, looked apprehensive and was restless. Blood pressure was 114/80; pulse 118/min; temperature 37 <sup>0</sup> C. The respiratory rate of 28/min and shallow breathing was also observed.  On palpation there was decreased expansion of the left hemithorax. On percussion there was decreased dullness in the left infrascapular & axillary area. On auscultation decreased breath sounds over the left lung base was observed. An X-ray was requested.		
(a)	x-ray provided Describe the changes observed in X-ray provided		(2 marks)
(b)	Interpret the clinical findings and the X-ray provided and state the most probable diagnosis		(1mark)
(c)	To relieve the breathlessness a pleural tapping was done and the fluid was sent for analysis.  The report revealed a transudative effusion.  List any 2 common causes for each of the exudative and transudative pleural effusion.  Explain the components of Light's Criteria which help to determine if the pleural fluid is exudative.		(1 mark)    (1 mark)
(d)	On further investigated the cause of the effusion was confirmed to be due to pulmonary embolism. The patient was started on unfractionated Heparin given through IV infusion.  Explain the mechanism of action and side effects of Heparin		(2 marks)
<b>Key Feature Question (Total: 8 Marks)</b>			
Q2.	A 16 year old male is rushed to the emergency department with sudden onset of breathlessness and inability to speak full sentences. His high school teacher informs the medical officer that he is an asthmatic		
(a)	List any four further relevant points in the history to be elicited that would point to the confirmation of bronchial asthma		(2 marks)
(b)	Describe the clinical signs of acute exacerbation of bronchial asthma		(2 marks)
(c)	A bedside ABG Is taken  pH : 7.21 PO <sub>2</sub> : 62 PCO <sub>2</sub> : 65 HCO <sub>3</sub> : 23.5  Interpret the ABG and state the diagnosis		(2 marks)
(d)	He is managed with nebulization. He was discharged with a) MDI – Salbutamol b) MDI – Budesonide 2 puffs daily  Explain the rationale for prescribing MDI budesonide and the daily dosage		(2 marks)

## Conclusion

The overall objectives of the course and the intended specific learning outcomes of each trigger are key factors that can develop PBL into a valuable tool for filling up the knowledge gaps in any curriculum in an active learner driven environment.

It is a common error to view a PBL case scenario as a single entity. It should be seen as a continuous process. Even though reinforcement of learning outcomes is permitted, repetition of core issues like for instance "breathlessness" in Cardiovascular and Respiratory systems is best avoided unless for reinforcement of certain must know outcomes or in a spiral PBL where the subsequent case scenario activates the prior knowledge gained in the previous one and adds on new learning outcomes. The activation of prior knowledge, the formulation of learning outcomes derived from and defined by the learners' need to know, and the active construction of concepts through dialogue and reflection promote long-term retention of newly acquired information. (Schmidt 1993; Regehr & Norman, 1996)

With this we firmly believe a PBL formulator's check list should include these questions

- Are there issues to discuss?
- Does this issue provoke interactive discussion?
- Are the learning outcomes relevant to the phase of study?
- Does this problem/s require self-directed study?
- Does this problem/s motivate learning? (Samy, 2007)
- What domains do these problems address?
- To conclude, the objectives of AIMST University PBLs can be summarized in an institutionally appropriate acronym.

Problem based learning should (AIMST)

- ✓ Activate prior knowledge
- ✓ Integrate basic and clinical sciences
- ✓ Motivate interactive learning
- ✓ Stimulate self-directed learning
- ✓ Trigger curiosity and thus further reading

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