Reflections: Evolution of PBL in the International Medical University

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Abstract: This paper traces the evolution of PBL in the International Medical University over a period of twenty years; since its inception in 1992 till 2012. It is a record of the reasons for the evolution, the people involved and the strategies adopted. The PBL in IMU has metamorphosed over the years from a paper-based complete case history into its present form of staggered release of information, paper-based or otherwise (videos, web-based, newspaper cuttings, debates). Strategies to improve student and facilitator buy-in, strengthening of facilitator training, adoption of PBL templates, innovations to improve student participation are discussed.

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Key words: IMU, twenty-year history, PBL, innovations

Introduction

Conversations in the University often turn towards the issue of short-lived institutional memories, and how these memories often become inaccurate because many of us remember in fragments. Most institutions do not invest time or money in record-keeping and the history and contributions of people go largely unrecorded, lost in the mists of time. The irony is that we spend more than a third of our waking lives at work; and we in the International Medical University (IMU) have put in so much effort trying to give our students the opportunity of spreading their wings, widen their horizons, and reach their full potential through the magic of problem-based learning (PBL). And yet, the exciting phases of evolution in IMU have not been adequately recorded.

Historical perspectives

The IMU was founded in 1992 as the International Medical College (IMC) to meet the needs of students who wished to pursue a career in Medicine, but could not do so because of the limited places in government institutions. Problem-based learning (PBL) was adopted as an important means of delivery right from the inception of the IMC largely due to the fact that Professors Ronald Harden and Ian Hart, who had been the advisers when the Medical School of the Universiti Sains Malaysia (USM) was founded, were also on board. This was a challenge, because Malaysian students had been brought up in an education system which encouraged learning by rote, in teacher-centred learning environments.

Not many problems were encountered in the early days as student numbers were small and the handful of staff could discuss how the sessions would be run. However, with student numbers increasing as a result of IMU's growing reputation and the 1997 economic downturn, problems with PBL surfaced. The double intake a year had begun in 1997, and that meant that the staff workload had also doubled. Briefing and debriefing sessions on PBL were no longer possible, and students and faculty buy-in were waning.

In 1999, it was decided that a PBL Working Group reporting to the Faculty Board be formed. This was done *impromptu* at a Faculty Board meeting with a show of hands. This original group consisted of Ammu Radhakrishnan, Chu Wan Loy, Gnanajothy Ponnudurai, Hla Yee Yee, Paul Jambunathan, Vishna Devi Nadarajah and Yu Sui Chen. This group functioned as a team, and there was no designated leader. This group tried to reactivate Facilitator meetings before PBL sessions, propagated the PBL philosophy and identified the objectives of PBL as a curriculum delivery tool. A video of "good" and "bad" PBL sessions were shot with the group members as actors. This was used for new staff to critique during PBL Facilitator training workshops which were conducted once a year. PBL triggers were reviewed to check for authenticity. However, all triggers were case-based, covering a single case from beginning to end, with the whole story revealed to students.

Over the years, some group members (AR & CWL) left to better focus on laboratory-based research, but others remained; and new members joined. Ultimately,

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CYS was appointed Coordinator for PBL, and led the group until recently.

Evolutionary changes

The concerns about PBL brought up at the bi-annual PEAC (Professional Education Advisory Committee) meetings and strategies put in place, outputs from PBL retreats, the 2006 report on Review of PBL in IMU by Anne Garden, presentations and publications of the PBL Working Group (Medical Sciences) , were reviewed, to trace the evolution of PBL in IMU.

Strategies to improve student buy-in

It had been recognized that students view PBL from the point of view of passing examinations (Tan, 2002). They obviously did not grasp the importance of PBL as a means of acquiring the softer skills so important in their future careers. The first intervention was the introduction in 2001 of "PBL Induction" with feedback into the Orientation Week for new students. Perceptions of students pre- and post-induction demonstrated an appreciation of the hands-on PBL; and an acceptance of the Facilitators' role as a medium of stimulating discussion (Ponnudurai, Nadarajah & Chen, 2005). Students experiencing PBL for the first time also appreciated that PBLs are not just a means of knowledge acquisition (Perera, Wai, Azman & Balachandran, 2011; Yeoh, Ong & Pook, 2006).

The PBL Working Group (henceforth referred to as "the Group") recognized that maintaining the enthusiasm for PBL as students progressed to the senior semesters would prove to be a challenge. Indeed, facilitators fed back about the waning enthusiasm in senior semesters at the PBL briefing and debriefing chaired by the module coordinators. Negative comments about PBL were also voiced by students to the members of the Academic Council (AC) which is comprised of the Deans of all the Partner Medical Schools (PMS) and is an external auditing body that visits IMU annually. These comments were mainly about the uncertainty on

how much content is to be covered, and the variation in methods of facilitation. This prompted IMU to engage an independent observer to assess the effectiveness of PBL in IMU. Focused group discussions and questionnaires given to a random group of students revealed that (1) students appear to appreciate PBLs better as they progressed through the semesters (2) students are not clear about the width and depth of learning to be covered in PBL (3) students thought that the ratio between lectures and PBLs was fair (4) there was a wide variation in the way PBL was conducted (5) there is a parallel curriculum (6) Facilitator training should be enforced regardless of the number of years faculty have served (7) a Curriculum Manager should be appointed (Garden, 2007). The recommendation was that IMU should aim at a PBL revolution; and not an evolution. This "revolution" should put PBL at the centre of all learning activities in IMU.

Strategies to improve student and faculty buy-in were adopted at the "PBL Revolution Retreat" (MERU Report, 2006) and "Quality Template Retreat"(MERU Report, 2005). These included Facilitator training and retraining, adoption of templates to standardise PBL, fine-tune the PBL process assessment , re-expose students to the philosophy and objectives of PBL at the beginning of every semester, encourage lateral thinking by giving information in steps to students, ensure PBL content is assessed.

Recognising the importance of feedback and reflection, the Group introduced a student worksheet which had check-listing of the PBL against the 8 IMU outcomes, the 5-minute reflection and verbal feedback (Appendix 1). Student participation in PBL was monitored using a "PBL Process assessment" form once a semester. The verbal feedback sessions also became a valuable opportunity for students to learn the principles of feedback and of reflection. Experiences were shared in a friendly atmosphere as students encouraged peers, and it often happens that students who dominated sessions promised to give others more chance to talk, in future.

Students regularly fed back their concerns about PBL "not being assessed" and not being sure about how much PBL should cover, to Academic Council members during their yearly meetings with student groups. The strategy to address these concerns was to re-introduce pre- and post-course meetings of PBL facilitators, and for facilitators to check-list learning objectives identified by students with that of the faculty's. The students' perception that PBL is not assessed is incorrect because the PBL content is assessed in summative examinations; more emphasis was now put in place by utilizing some of the PBL cases in the MEQ papers.

The PBL process assessment was introduced in 2001, and the format underwent a series of revisions until the current format was adopted (Appendix 2). Students assess themselves and peers; the facilitator assesses the students. (A separate form is used for students to assess Faculty). However, this assessment serves as a mechanism for self-improvement in PBL, and is not summative in nature.

The ICE (IMU Centre for Education; formerly called "Medial Education Research Unit") conducts course evaluation using a questionnaire that includes questions on PBL: whether they find the sessions useful; whether the triggers were realistic; whether PBLs help in learning and clinical reasoning. The PBL sessions scores started off between 3.5 and 4.0, but in recent years, these have improved in most modules, leaning more towards 4.5-5.0 / 6.0.

Strategies to improve Faculty buy-in and quality of facilitation

Of the many determinants of whether PBLs are successful or not, it was becoming clear that facilitator buy-in and training was lacking (Hla Yee Yee, 2002; Hla Yee Yee, Mala Maung & Mobbs, 2002). Some faculty seemed to think that medical doctors are more appropriate to facilitate (Chen, Nadarajah & Ponnudurai, 2003); students also preferred medical doctors (Hla Yee Yee, Radhakrishnan & Ponnudurai,

2006). Hay & Katsikitis (2001) had also cautioned about using non-medical facilitators for PBL in medical school. Groves, Rego & O'Rouke (2005) found that clinicians tended to use their subject content more than non-clinical tutors, and that whilst content knowledge and facilitation skills were both necessary, they were not individually sufficient characteristics of effective tutors. Others are of the view that content expertise is not necessary for effective facilitation. Barrows & Tamblyn (1980) are of the view that a faculty person who is a good tutor can successfully tutor in any area. Whatever the case may be, there was a pressing need to improve PBL facilitation by more rigorous training of facilitators. The "content experts" were tempted to teach, and "the non-content experts" sometimes felt out of depth. However, the Group accepted the Mc Master Education Committee's idea that the non-expert would be less inclined to emphasize detail and more inclined to see things from the view point of students and hence have the potential of becoming better facilitators (Neville, 1999).

Along with the PBL Induction, the PBL Working Group also produced a guide for Facilitators titled "Introduction to PBL", describing why PBL was necessary, the philosophy and objectives of PBL, the ground rules to be observed in PBL. This guide contains the PBL triggers and Facilitator Guide for the PBL sessions done in Semester 1 ("Foundation Block" in the "New Curriculum-2011"). Unfortunately, this guide has not been made available for faculty who are not facilitating Semester 1 PBLs.

The template for Facilitators was also adopted at the QT Retreat in 2005. This guide contains tips for prompting discussion tailored for the trigger in question. A glossary of medical terms is also included for the benefit of non-medical facilitators. The synopsis of the case gives an overall picture so that facilitators can steer back students if they veer too far away off- course. The drawback that we found with the adoption of this template was the tendency of some coordinators to cut and paste volumes of information from the textbooks or internet.

PBL Facilitator training was introduced around 2002, and new staff were required to attend this one-day workshop and to shadow PBLs of facilitators who got good feedback from students. Whilst the effectiveness could not be assessed because of logistics problems, the Group suspected that it was not optimal because newcomers had to be used immediately after the one-day training; often, the training came after the staff had already taken a few sessions. This is because staff recruitment is an ongoing exercise and faculty join the IMU year-round. The double intake of medical students and the large number of students (there are 18 PBL groups of 10-12 students) also means that all faculty need to be utilized. More effort will need to be made to observe the trainees in their PBL sessions, particularly if the quality of PBL facilitation is to be taken as a criterion in awarding Teaching Excellence awards. This effort has already been started this year, with the PBL Facilitator training staggered over three days rather than completed in one. Observation of trainees by the trainers is now made mandatory, and the University is now looking towards adopting "Teaching licenses" which include effective PBL facilitation as a skill to be mastered.

PBL process assessment training was introduced around 2003. PBL facilitation & process assessment, Principles of Education Science, Providing Feedback are now on the list of mandatory training to be completed by new faculty within a year of joining IMU.

Strategies to improve the quality of triggers

Savery (2006) wrote, "Critical to the success of the approach is the selection of ill-structured problems (often interdisciplinary) and a tutor who guides the learning process and conducts a thorough debriefing at the conclusion of the learning experience". This echoed our conviction that triggers that are too complete leave little room for lateral thinking and discussion. So we developed a new approach to PBL; triggers were given in two or three steps, with minimal information given in Step 1 to encourage lateral thinking (Ponnudurai, Chen, Nadarajah & Hla Yee Yee, 2006). In order to

make PBL more interesting, multimedia triggers were introduced in 2003. Out of 4 triggers in the Respiratory System, two were given online to students and in a CD to the Facilitators; two were paper-based. As expected, students reported that the triggers given online made the case more real and interesting (Nadarajah, Chen, Hla YY, Ponnudurai & Radhakrishnan, 2005). A follow-up study (coded "VMU 22") involving 22 students who volunteered to do the online version of the two cases to compare their perceptions of PBL and performance in the in-course examination showed that these 22 enjoyed the PBL sessions and fared equally well with their peers in knowledge acquisition.

Feedback about PBL materials being handed down by senior students to juniors was seen to be partly responsible for students not doing PBLs properly. Attempts were made to increase the number of triggers available. A "Triggerthon" Retreat was held in 2006 to generate PBL triggers; this was repeated in 2011.

In the meantime, comments about the PBLs in IMU not being true PBL but Case-based Learning (CBL) i.e. built around a case kept cropping up at medical education meetings, and in 2004, an attempt was made to construct triggers based on a concept rather than a particular case e.g. patient presenting with swelling of the legs rather than a typical description of a case of heart failure. This type of trigger was what was becoming known as "concept-based learning". The concept underpinning this trigger would be "Oedema can result from raised hydrostatic pressure on the venous side of the capillaries due to back-pressure developing as a result of right ventricular failure"; but before the fact that the hydrostatic pressure is raised is revealed in Part 2 of the trigger, students would need to ascertain whether there was a difference between bilateral and unilateral swelling, what causes an increase in tissue fluid formation (hypoproteinaemia; what causes hypoproteinaemia; increased permeability of capillaries; what causes this; increased venous pressure; obstruction in lymphatics). Some educators feel that triggers are better without answers; but in IMU, we opted for

those that are "neater" i.e. a diagnosis is reached in the end, because clinical reasoning ends in a provisional diagnosis, in the real world.

As case-based learning (CBL) continued to be dismissed by PBL "purists" as a corrupt form of PBL, faculty reviewed the situation and found that the triggers constructed in the earlier years were based on a single case, with the whole case given on a page. This had given way to the approach of staggered release of information, but they were mainly focusing on one particular case. A review of triggers from Semesters 1 through 5 revealed that "purer" forms of PBL were seen in the junior semesters, with more CBL-like triggers dominating the senior years, as information given went deeper into issues and focused mainly on a particular diagnosis (Hla Yee Yee, Ponnudurai, Chen, 2011). Coordinators were requested to ensure that triggers were based on concepts rather than cases, and to use the PBL template. Some educators feel that CBL is of more value, given the dense medical curriculum and need for efficient use of student and faculty time (Srinivasan, Wilkes, Stevenson, Thuan Nguyen and Slavin, 2007). Katsikitis, Hay & Wade (2002) reported that students opting to participate in PBL or CBL did equally well in tutor evaluation or factual knowledge. So our contention was that it is not the case *per se* which makes it a PBL or a CBL, but dictated by the objectives of the session and the skill in facilitation of the faculty.

Strategies to improve the PBL Process

Many innovations were tried out over the years to improve the PBL process. These included trying out various forms of conducting PBLs e.g. role-play, debates. A PBL done for microbes, with students taking on the role of microbes and debating on their innocence at the "International Court of Injustice" (Judson, 2008) won the IMU-Ron Harden Innovation in Medical Education (IMU-RHIME Award) when it was introduced at the International Medical Conference (IMEC). The School of Dentistry has also tried the debate approach for the past three years and has published a paper on students' perception of this approach.

Another strategy that was tried was what we called the "Flying A Kite Approach" (Hla YY, Radhakrishnan & Ponnudurai, 2008). In this approach, minimal information is given e.g. "A 19-year-old girl presented with tiredness of one month duration". Further information was staggered, and students were encouraged to discuss on issues which they found interesting although these may not be directly related to PBL; we allowed their thoughts to fly like kites; pulling them back if they drift too far afield. The feedback received was that this approach stimulated thought; we in turn felt that it reflected true self-directed learning, rather than directed self-learning which inevitably results if students need to adhere strictly to faculty-determined learning objectives.

With e-learning becoming more and more popular (Zorainiwati, Somanath & Radakrishnan, 2003), there was an attempt to introduce online PBLs, with students getting the first part of the trigger online and working through the case by clicking on choices which included differentials, questions to be asked in history-taking, investigations, then formulating learning issues that are to be brought to the face-to-face PBL session to be check-listed against the faculty's list; then go on to self-study and discuss what is learnt or is not clear at the second face-to-face meeting (Hla YY, Judson & Kahlil, 2006; Hla YY, Judson, Ponnudurai, Chen, N Wai, Azman, 2008).

The "Value-added PBL" (Hla Yee Yee, Ponnudurai, Chen & Judson , 2011) was conceived with the objectives of making PBLs more contextual, encouraging team-work, and to highlight the problem of over-investigating creating a financial burden to patients. In this format, a student takes the role of the patient, and another takes care of the "Laboratory & imaging". Minimal information is given in the first part e.g. "A 67-year-old man woke up and discovered that he had weakness of the lower limbs". Students had to discuss and decide what further questions were necessary; then they "ordered" tests and were "charged" for the tests. A tab of how many questions were asked before a diagnosis was reached,

how many tests were ordered and how much it cost, was taken. They were then asked to reflect on how they could have taken the history more efficiently and which investigations were unnecessary. Students reported that they found it more realistic and challenging and that it helped in history-taking. Our hope was that they would take the message of the financial burden on patients into their practices.

PBL in the "New Curriculum" (2011)

A new curriculum was adopted in 2011, placing clinical skills at the hub of learning; all learning activities including PBL would be aligned to the clinical problems. This meant that the "trigger a week" based on the theme of the week would not be appropriate. Certain changes to the delivery of PBL have now been adopted. These include (1) co-ordinators being given the liberty to choose the number of PBLs in their module rather than to comply with one a week (2) Coordinators to identify the symptom that would be used for PBL e.g. chest pain or breathlessness rather than myocardial infarct or tuberculosis ; these cases are to be aligned to the 117 competencies identified for the IMU Clinical School (2) PBL-1 to start mid-week and PBL-2 to be done in the following week, to allow more time for research over the weekend (3) A separate PBL focused on ethics to be included in every module.

The Group has also religiously met to vet every PBL trigger thoroughly, and facilitators unanimously report more active participation within groups in the Foundation Block. The unanimous observation of facilitators taking PBL in the Foundation Block is that group dynamics appear to have improved, especially with the ethics-focused PBLs like the case of the 16-year-old unwed girl who requested for an abortion at a clinic and who was refused, with the result that she went through an unwanted pregnancy without any kind of support and finally dumping the newborn into a waste disposal bin. The discussion in a group that I took was very interesting because of the diversity of backgrounds. This was a mixed group of medical and dental students,

and among them was a girl who had been a nurse, and a young graduate who is already a father and who had worked with a support group for unwed mothers in Singapore. This brought up the issue of varying laws in different countries, whether the parents need to be told, religious aspects (this led to the definition of life; does it start with fertilization or the first heartbeat or when a fetus is fully formed?). The scenario of a cardiologist's old clinical tutor visiting his clinic where he was prescribed expensive anti-hypertensives without proper examination , and where he saw the representative of the drug company selling the said medicine walk in also stimulated active discussion amongst the groups.

The Way Forward

The PBL Working Group of the School of Dentistry has begun to involve students in trigger-writing, shooting videos for triggers. This is a good move and gives a sense of ownership to students. The PBL Working Group of the Medical School is also being re-organised, and will have student representatives as members; they will also take part in vetting the PBL materials.

Some of IMU's partner medical schools have the practice of compiling quality PBL cases and according publication status to authors of cases accepted into the books. This may be something IMU might want to adopt. Compilation is certainly a good practice, since a lot of effort has to be put into creating good cases, and these should not be lost over the years. Preparation of teaching material is one of the many roles of a teacher (Harden & Crosby, 2000) and work well done should not go unacknowledged.

IMU is in an excellent position to promote inter-professions education, with students from medicine, dentistry and health sciences all under one roof on the Bukit Jalil campus. PBL is one of the learning environments where this can be implemented seamlessly. In the "Value-added PBL", pharmacy students can man the "virtual pharmacy", biotechnology students can take care of "Laboratory & Imaging", nursing students

can take the role of nurses in a PBL which could be set in "simulated wards". Aligning the time tables of the various courses is the major challenge for such an undertaking.

REFERENCES

1. Barrows HS. & Tamblyn R (1980) Problem-Based Learning: An Approach to Medical Education (New York, Springer).

2. Chen YS, Nadarajah VD & Ponnudurai G. Perception of Facilitators in a medical curriculum. J.Med.Educ. (Taiwan). 2003; 7 (4): 425.

3. Garden A. Report on Assessment of PBL in IMU. 12th PEAC paper. 2007.

4. Groves M, Régo P & O'Rourke P. Tutoring in problem-based learning medical curricula: the influence of tutor background and style on effectiveness. BMC Medical Education 2005; 5: 20.

5. Harden & Crosby J. The Good Teacher is more than a Lecturer the twelve roles of the teacher .AMEE Guide No.20. 2000.

6. Hay PJ & Katsikitis M. The 'expert' in problem-based and case-based learning: necessary or not? Medical Education 2001; 35: 22- 26.

7. Hla Yee Yee. Why do PBLs "fail"? 2nd FAOPS Congress, Kuala Lumpur, 2002

8. Hla YY, Judson JP, Kahlil AK. The tutorless PBL. Symposium on E-Learning, 6th Asia-Pacific Conference on PBL , Tokyo, May 2006

9. Hla YY, Judson JP, Ponnudurai G, Yu SC, Wai N, Azman A. Bridging the divide: the DIY-PBL. IMEC 2008.

10. Hla Yee Yee , Mala Maung & Mobbs I. Triggering successful Problem-Based Learning sessions. J Med Educ (Taiwan) 2002; 6(2): 194-197

11. Hla YY, Ponnudurai G, Chen YS. PBL or CBL? That is the question! 6th AMEA Congress, 2011.

12. Hla Yee Yee, Ponnudurai G, Yu Sui Chen & Judson JP . Value-added PBL. 6th AMEA Congress, 2011.

13. Hla YY, Radhakrishnan A, Ponnudurai G. Improving PBLs in the International Medical University: defining the 'good' PBL facilitator. Med Teach; 2006; 28(6): 558-560.

14. Hla YY, Radhakrishnan A, Ponnudurai G. Improving Problem-Based Learning (PBL): let's go fly a kite! J Med Edu 2008; 11(4): 308-313.

15. Judson JP, The PBL Group G. Innovation in PBL: VILLAINS- a debate in the "International Court of Injustice". IMEC 2008

16. Katsikitis PJ, Hay RJB & & Wade T. Problem- Versus Case-based Approaches in Teaching Medical Students about Eating Disorders: a controlled comparison. Educational Psychology. 2002; 22 (3): 277-283.

17. MERU report on PBL Revolution Retreat, 2006.

18. MERU report on Quality Template Retreat, 2005.

19. Nadarajah VD, Chen YS, Hla YY, Ponnudurai G, Radhakrishnan. Student perception of multimedia PBL and paper-based PBL triggers: a comparison. 2nd Med Educ. Colloquium 2005

20. Neville A J. The problem-based learning tutor: Teacher? Facilitator? Evaluator Medical Teacher. 1999; 21 (4), 393- 401.

21. Perera J, Wai PW, Katrina A, Balachandren N. Problem Based Learning as a tool for developing 'soft' skills: perceptions of the new medical undergraduates. 6th AMEA Congress, 2011.

22. Ponnudurai G, Chen YS, Nadarajah V, Hla YY. Improving Problem Based Learning (PBL): two steps approach. 3rd Med Educ. Colloquium 2006.

23. Ponnudurai G, Nadarajah VD, Chen YS. PBL induction programme at the International Medical University: students' perception, Med Educ; 2005; 9(2): 131-137.

24. Savery JR. Overview of Problem-based Learning: Definitions and Distinctions. The Interdisciplinary Journal of Problem-based Learning. 2006; 1(1): 9-20.

25. Srinivasan M, Wilkes M, Stevenson F, Thuan Nguyen, and Slavin S. Comparing Problem-Based Learning with Case-Based Learning: Effects of a Major Curricular Shift at Two Institutions, Academic Medicine, 2007; 82(1): 74-82.

26. Tan GJS. Riddled pathways to the conduct of problem-based learning tutorials. J Med Educ (Taiwan) 2002; 6(2): 212-214.

27. Yeoh PN, Ong CE, Pook P. Student feedback on Problem Based Learning (PBL) in pharmacy: a pilot study. 3rd Med Educ. Colloquium 2006.

28. Zorainiwati A, Somanath SD, Radhakrishnan A. Increasing the effectiveness of Problem-Based Learning: online possibilities. JIRSEA 2003; 2(1): 59-67.

Appendix 1

Student PBL Worksheet / The International Medical University / adopted at QT Retreat, 2005

PBL Student Worksheet

Part 1

Concept (To be filled in after PBL 1)

_____

_____

_____

_____

What is wrong with the patient? (Hypotheses)

1. _____
2. _____
3. _____
4. _____

Read Step 2
Refine your hypothesis in the light of the added information (Provisional diagnosis)

_____

_____

Learning issues identified:

1. _____ 5. _____
2. _____ 6. _____
3. _____ 7. _____
4. _____ 8. _____

Prioritise the learning issues to the most important.

Check the PBL session against the IMU outcomes achieved after PBL 2.

No.	Outcome	Yes	No
1	Application of basic sciences in the practice of medicine		
2	Clinical skills		
3	Communication skills		
4	Disease prevention and health promotion		
5	Family and community issues in health care		
6	Professionalism, ethics, and personal development		
7	Self-directed life-long learning & information management		
8	Critical thinking & research		

Self-assessment of the PBL process (How did you do? How did the others and the Facilitator do?)

PBL 1: _____

_____

_____

_____

_____

PBL 2: _____

_____

_____

_____

The 5- minute paper

What did you learn from the two PBL sessions? What was good about it? What was bad? Any take- home messages?

hyy/250507

Appendix 2

EVALUATION OF PBL PROCESS BY STUDENTS/FACILITATOR

Name of Student _____   Signature _____

Intake _____   Semester _____   Group _____   Date _____

Group Score _____

Student Name	PBL OUTCOMES (Maximum score = 5)						TOTAL	Comments
	1 Communication Skills	2 Team-work	3 Cognitive skills	4 Demonstration of Knowledge	5 Presentation mode	6 Professionalism & Attitude		
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								

Use the scoring guide to assess yourself and your peers.