

Twelve tips for medical students to improve identification of “Learning Issues” in Problem Based Learning.

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Problem based learning is an approach to learning based on a “problem” that prepares students better for real life situations. It is often abbreviated as PBL and can be better defined as “a learning method based on using problems as a starting point for acquisition and integration of new knowledge”. The core element of a PBL method is identifying the learning issues in the problem that requires explanation or definition of the problem (Dolmans *et al.*, 1984). This is done in the first session of the PBL method which is known as “brainstorming”. In this step, the students read the problem given in their small group and identify the unfamiliar terms and the “learning issues”. From the learning issues, they make hypothesis and find out the learning objectives for self study. Identification of learning issues is the major part of the brainstorming session as mentioned in the literature, but clear steps to do the same are not mentioned.

This leads to a tutor-student disparity in identification of learning issues, as the students are dealing with a partially or totally unknown case for discussion. We at Melaka Manipal Medical College (India) have been conducting PBL sessions regularly for the first and second year MBBS (Bachelor of Medicine and Bachelor of Surgery) students, from September 2006.

There are twelve PBL sessions per year. From our experience of PBL sessions, focus group

discussions, open discussions on PBL by the faculty of all disciplines, and frequent feedback from our students of first and second year MBBS, we have come up with twelve tips to improve the identification of learning issues.

1. Understand, that the learning issues are not just the words, sentences, or part of sentences which can be copied directly from the problem text

Students have a tendency to pick some words or sentences directly from the text of the problem such as “40 year old businessman” “Right hemiplegia” etc and put them as issues. Even though in some situations, these words and sentences acts as issues; which can give rise to hypothesis, sometimes they act as distracters. For example the learning issue may be the factor causing “right hemiplegia” but some students may think about only the meaning of the term “right hemiplegia”

2. Understand that the learning issues are the significant components of the problem (Anonymous 2003)

The PBL process is meant to stimulate a deep understanding of the subject matter. So the students need to analyze the problem with their prior knowledge (if any) and identify the issues; keeping the patient as the “person in need of medical help”. The patient’s real problem/problems should be clarified, without excluding any explanations.

3. Understand that the identification of all the issues in the problem gives a global definition or overview of the problem

Once a group identifies all the issues present in the given problem; the students need to analyze the problem with their basic knowledge for example by raising the questions like, ‘is this condition common for this age’, ‘whether the life style will enhance the occurrence of the condition’ etc.

After the discussion the group will come up with an overview of the ‘problem’. Now the group can define the problem in a few sentences; which gives a clear idea about the

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problem based on their knowledge and understanding.

4. Understand that the issues play the key role in PBL as hypothesis and learning objectives are developed from the redefined issues

The issues identified will lead the rest of the process in PBL practice. Thus if the group fails to identify the correct learning issues, the hypothesis and even the learning objectives will deviate from the original path. So the students need to critically analyze the problem with their prior knowledge and keeping the patient involved as the central element.

5. State the learning issues in the form of questions when possible (Anonymous 2003)

In real sense, the brainstorming starts from this level. If the students pick up the statements directly from the text in the order it appears, they start thinking from the picked out issues. This makes the brainstorming session ineffective. If they format or state the issues in the form of questions when possible say e.g. "what caused right hemiplegia?, Whether the age and lifestyle play a role in it?" etc it will give more meaning to the process. It should be noted that identification of issues is not compulsory with questions but only when it is applicable.

Another example is the following problem "Injured Knee"

Mr. James Jones, a 26- year- old defender of the national football team of India was very popular for his achievements. During a regional club match he was tackled by the forward player who hit his left knee from the side, when his foot was firmly planted on the ground. He felt severe pain and fell. As a result of left knee injury he was taken by ambulance to the hospital where an "unhappy triad" was diagnosed. Recovery after surgical treatment was prolonged and complicated, resulting in residual instability of the knee joint. The locking and unlocking mechanisms of the knee were not proper. His teammates are waiting for the day when he would be able to play with the team again (Anonymous 2007).

What issues in this problem are expected from the students? We gave this problem to two medical students to bring out the learning issues.

Student one responded as follows:

- 26 year old football team member

- Last game-forward player hit his left knee from the side, when his knee was firmly planted on the ground severe pain, fell
- Left knee injury ("unhappy triad" diagnosed)
- Recovery prolonged & complicated
- Instability of the knee joint (improper locking &unlocking mechanism of knee joint)

Student two responded as follows:

- 26 year old football team member
- Tackled by forward player
- Left knee from side being hit by forward player when foot firmly planted on the ground.
- Severe pain, fell
- Left knee injury
- "Unhappy triad" diagnosed
- Recovery complicated & prolonged
- Instability of the knee joint (improper locking & unlocking mechanism of knee joint)

The same problem was given to two facilitators.

Facilitator one responded as follows

- Hit from side
- History of fall
- Diagnosis of unhappy triad
- Recovery is prolonged & complicated
- Residual instability
- Improper locking &unlocking

Facilitator two responded as follows

- Mr.James Jones's left knee being hit by forward player on the side when he was firmly planted on the ground- Diagnosis of unhappy triad.
- Recovery is prolonged & complicated
- Residual instability
- Improper locking &unlocking

Note the difference when the learning issues are formed as questions.

- Whether injury to the knee joint while playing football is common? (It may be a fact)
- What prevents the player from participating in games after having unhappy triad? (A good medical dictionary will give answers to unfamiliar terms like "unhappy triad")
- "Hit to left knee from side, when foot is on the ground" is this mechanism of injury important? If "yes" how?
- Why recovery after surgery was prolonged & complicated?

- What causes the residual instability of the knee joint?
- Why locking and unlocking mechanism is not proper after injury?
- Whether Mr. James Jones will be able to play with the team again?

6. Rethink when the facilitator asks open ended questions

If the tutor or facilitator interrupts in the process by asking open ended questions such as “what does it have to do with the problem?” or “is that a learning issue?” the group should re-think about their line of discussion. Always remember; the tutor is just a facilitator and not a teacher in PBL session to correct you with the right answer. He or she will only direct you to the correct method or finding out the correct learning issues by asking questions or giving some related ideas.

7. Prioritize the important components if many learning issues are identified

Once the group members and the facilitator agree to the learning issues identified as the final set, it is important to prioritize the learning issues. This step is important to identify the major issue/issues that constitute the root cause of the disease/problem. Signs, symptoms and complaints have to be arranged in the order of priority in relation to the actual problem of the patient. This step is important, as further discussion can concentrate more on the major issues.

8. Eliminate and streamline the distracting or deviating issues, if any

Eliminating and streamlining the relatively less important issues or distracters are necessary to avoid the deviation from the major element of the problem.

9. Identify the core issue and summarise the problem

Summarise the actual problems of the patient or to give a global definition of the problem.

10. Link the “selected” issues using concept map

The selected issues can be arranged in the form of concept map. This will help for a quick review of the problem for the rest of the process and will also give a complete understanding of the problem.

11. Understand that the learning issues can give rise to hypothesis or lead to known facts

It is not necessary that all the learning issues should give rise to hypothesis always. It can be a known fact or some basic knowledge. Only if it is very new, the group needs to derive at a hypothesis.

12. Understand that the identification of learning issues is a cycle instead of a single step

Identification of learning issues is not a one step process, as it needs to be changed or modified during discussion or at any time in the later steps. Prioritization of issues may change at the end of brainstorming as the group completes critical analysis of the “problem”.

Conclusion

PBL is an effective method of active learning. Proper identification of learning issues and questioning the problem by students will enhance their knowledge. If the students fail to identify major issues in the problem, there may not be any critical thinking or active learning which is what is essential in a PBL practice.

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Conflict of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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