

Problem Based Learning



*What ?
Where ?
How ?
Who ?
When ?
Why ?*

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What is PBL based on?

Problem Based Learning (PBL) is based on problems. A problem is a description of a set of phenomena or events in need of explanation in terms of an underlying process, mechanism or principle. The task of a group of students is to explain the phenomena or events provided in the given problem.

Example: Sarah

During the last few years, Sarah has grown tall very quickly. She has always been a tall girl, but at an age of 11 years and a height of 170 centimeters, she rises head and shoulders above her age group.

Faculty Objectives:

To know the normal rates of child growth

To understand the mechanisms/processes that affect growth.

To describe the diagnostic procedures used to predict growth.



Where is PBL practiced?

PBL takes place in small group tutorials. Optimally the group contains 8-10 students.

Small group discussions promote peer interactions. Students in a group ask questions, answer questions, give each other explanations and discuss about disagreements.

These processes stimulate a deep understanding of the subject matter. Small group work also increases the ability to work in teams, a skill necessary in professional practice.



How do students discuss the problems in PBL?

While discussing the problems in PBL the Maastricht 7 jumps approach can be used. It provides an approach that applies the learning principles in a systematic manner to guide students to generate learning issues from the problem.

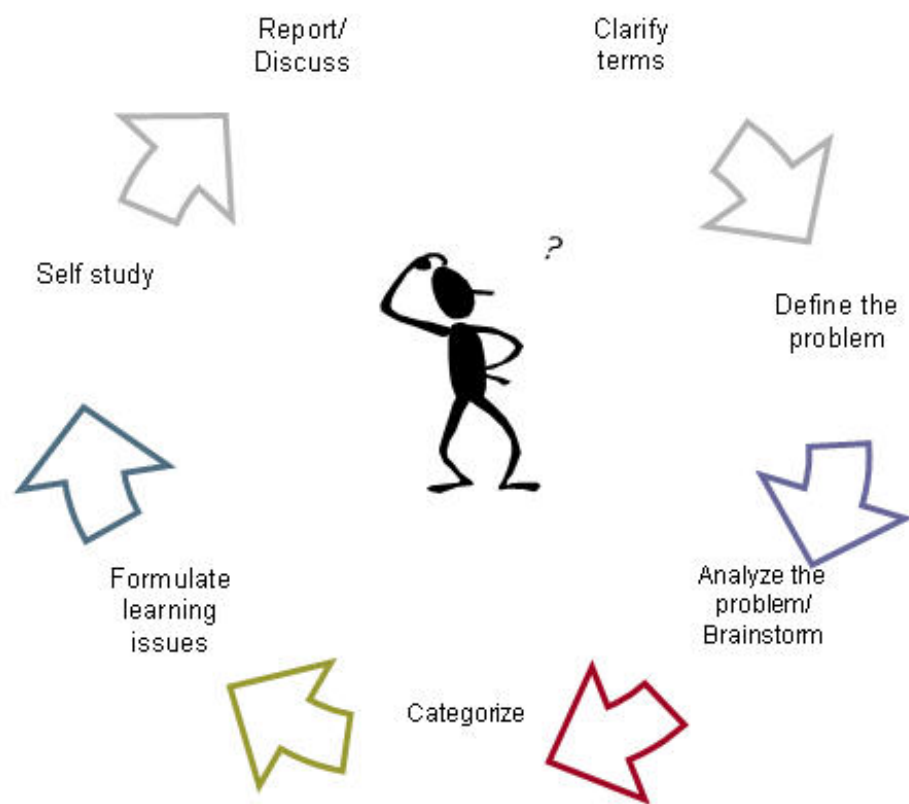
Maastricht 7 jumps approach:

- 1- Clarifying Concepts
- 2- Defining the Problem
- 3- Analyzing the problem/Brainstorming
- 4- Categorizing
- 5- Formulating Learning Issues
- 6- Self Study
- 7- Discussion of newly acquired knowledge

Discussion Phase: Step 1-5

The problem is initially tackled in a discussion phase that lasts 1-2 hours. This phase involves 5 steps.

- 1- Clarifying terms and concepts: This helps the group to start with a clear and common understanding of terms and concepts in the problem.
- 2- Defining the Problem: To clearly formulate a concrete defined problem or propose a definition of the problem. This helps to establish the boundaries of the problem under discussion.



Step 3: Brainstorming

Analyzing the problem: This step is meant to refresh the knowledge present within the group and to activate the prior knowledge. Listing to as many explanations or alternatives as possible for the problem without excluding any explanations is important.

Problem: Sarah Topics that could be raised during the brainstorm:

Is this normal for her age?

Are her parents tall?

What is normal growth?

The activity of hormones increases growth.

Medications affect growth.

She needs to do hormone analysis.

Eating style is important.

It is due to puberty

She has some vitamin deficiency.



Step 4 : Categorizing

Categorizing explanations listed in the brainstorming step. This helps in defining interrelationships between previous listed explanations. The group builds a coherent description of the explanations of the processes, the group thinks, underlies the problem.

Is this problem for her age? Are her parents tall?
What is normal growth?

Growth
pattern

The activity of hormones increases growth.
Medications affect growth.
Eating style is important.
It is due to puberty

Factors
affecting
growth

She has some vitamin deficiency
She needs to do some hormone analysis

Tests

Step 5 : Learning Issues

Formulating Learning Issues: Depending on the previous discussion, whatever is still not known or unclear can be formulated into clear, well-defined learning issues for self directed learning.

Problem: Sarah

Student learning issues:

What are normal growth patterns?

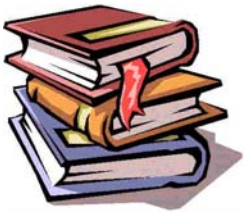
What factors influence growth?

Which tests predict growth?



Step 6 : Self Study Phase

Self Study: This step is meant to help the student to select relevant literature sources. Students are provided with a list of materials that are related to the problem. The students preferably make a selection of appropriate materials from this list.



After selecting the sources, many steps follow. All group members are required to study the resources, gain a clear understanding of the knowledge to link previous knowledge to new attained knowledge and to prepare to report back critically on the acquired knowledge.

Step 7 : Report Phase

Discussion of newly acquired knowledge: This phase is usually scheduled after a couple of days to allow time for self study. This session lasts 1-2 hours.

In this step all members of the group participate to answer the learning issues generated previously. Students may ask questions to clarify matters, elaborate on the new knowledge, test their understanding and depth of insight into the topics discussed.

Who is responsible for what?

The Student Roles:

By rotation every group member fulfils one of the following roles:

Discussion leader: the discussion leader is the chair. He/She has the responsibility of structuring the discussion, summarizing, stimulating, asking questions, concluding and following the 7 jump approach.

Scribe: the scribe takes notes of the analysis and discussion.

Participant: all group members are expected to participate in the discussion through providing and asking for information, summarizing, active listening, and providing and asking for feedback.

The Tutor Role:

The tutor is an educator who guides the tutorial group to successfully achieve the objectives of a curriculum. He/She may ask questions to:

- Draw attention to inconsistencies
- Widen the discussion.
- Check for accuracy.
- Stimulate integration of knowledge

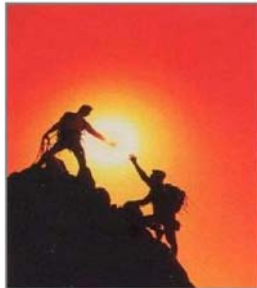
When can the process go wrong?

There are some situations that can affect the group dynamics in a PBL group. For example the presence of:

- 1- A Dominant member: A member who speaks a lot and does not provide an opportunity for the others to participate.
- 2- An Un-Prepared member: A member of the group who does not study for the report phase and does not contribute to the learning of the others.
- 3- A Reading Member: A member who brings a couple of references to the report phase and reads aloud from the books or papers.

4- A talkative tutor: A tutor that alters the process by providing mini-lectures during the tutorial.

5- A silent tutor: A tutor that does not intervene when needed.



Evaluation

At the end of the tutorial groups, feedback of the strengths of the group process and the matters that require improvement are to be discussed within the group. Providing well structured feedback and receiving feedback assists in further fruitful cooperation and gaining more in-depth discussions.

Issues that students are evaluated upon and should pay attention to:

- Dealing with work: well prepared for the meetings, reported findings in own words.
- Dealing with others: active listener, teamworker.
- Dealing with oneself: open for feedback, being on time.

Issues that tutors are evaluated upon and should pay attention to:

Stimulate students to:

- Report what they learned in their own words.
- Search for links.
- Formulate clear learning issues.
- Review various references.
- Apply the knowledge to the discussed problem and to other situations.
- Provide and receive feedback on self and group function.

Why Problem Based Learning (PBL)?

It is assumed that learning is an active process of constructing knowledge, rather than a passive process of memorization. The passive process of memorization may lead to inability to apply knowledge in a practical setting. In PBL students are encouraged to actively construct their own knowledge because students discuss the subject matter studied, ask questions and answer questions.

Active interaction in the group stimulates students towards a deep understanding of the subject matter. Finally, because most PBL problems have a close link with future practice, students are assumed to be better able to apply what they have learned in practice.

Conclusion

Problem Based Learning can provide you with a learning process that is knowledgeable, informative, motivating and full of enjoyment.





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