

SECTION 1

A Few Words on the History and the Theory behind PBL

Problem based learning is a method of teaching and learning that originated at McMaster University, Medical Program, in the mid-60s. This method's founding "fathers" were an iconoclastic group of physicians and basic scientists from the Toronto-Hamilton area who were recruited by the McMaster School of Medicine. They all shared a negative view of their undergraduate experiences and thought they could do better (Norman, 2008).

This method of teaching and learning spread fairly fast and within a few years of its conception, there were PBL curricula in the Netherlands, Australia, Israel and the United States. Now several hundred schools offer some form of problem-based learning.

In contrast to traditional, teacher-centered education, where learning is focused on discrete subject-related course, problem-based education is student-centered, in the context of a case-scenario (Saarinen-Rahiiika and Binkley, 1998; Solomon, Binkley and Stratford, 1996). Learning is driven by challenging, open-ended problems and is facilitated by a tutor, and students work in small groups.

The essential elements of PBL are (Solomon, 2005):

- Learning in small groups
- Changing the role of faculty member from expert lecturer to facilitator of learning
- Self-directed learning: students take responsibility of their own learning
- The stimulus for learning is a written problem – activation of prior knowledge, contextual learning, discovery learning

The theoretical premises for PBL (Solomon, 2005):

1. Contextual learning – was considered too simplistic to integrate the complexities of PBL (Colliver, 2000)
2. The information processing theory (Schmidt, 1983): contextual learning + activation of prior knowledge – provides more comprehensive theoretical support for PBL (Albanese, 2000)
3. Cooperative learning theory – individuals are dependent on other group members to achieve their goals - extensively used in small groups PBL. It results in superior problem-solving skills (Qin, Johnson and Johnson, 1995).

In early 2000s, administrators and curriculum planners at McMaster started the renewing process of the undergraduate MD curriculum. They first conducted an environmental scan that included input from medical residents (Lohfeld, Neville and Norman, 2005). They interviewed 17 medical residents, enrolled at McMaster at the time, who were graduates of 6 Canadian medical schools. The results of the study showed that PBL was well known even by graduates of non-PBL medical schools. Tutors are key to a successful PBL program, should be knowledgeable about the

content area under study and able to effectively facilitate groups. Tutorial problems should be realistic, up-to-date, and challenge student to investigate more than the medical aspect of the case in question. Students need to be prepared, willing to participate in peer teaching and supportive of the group learning process. PBL programs can be improved if they incorporate elements of traditional education methods (mini-lectures, clear learning objectives and unbiased evaluation of students' progress) while retaining the essence of student-generated learning.

The following are some of the findings of this study:

Greatest strengths of the PBL system:

1. PBL promotes students help and teach each other
2. PBL is based on contextual/real life learning - more memorable
3. PBL promotes better global knowledge
4. PBL fosters independent learning and teaches people how to learn
5. PBL students gain evaluation skills

What makes a good tutor?

1. Good group facilitator:
 - a. can keep students on topic
 - b. can handle difficult group dynamics
 - c. provides small amounts of targeted information
2. Clinical versus non-clinical:
 - a. general knowledge of content is enough
 - b. clinicians make better tutors
 - c. match tutors with unit topic
3. Knows how to evaluate students (knowledge versus group function, directness).
4. Likes students, teaching and PBL

What is student's role in PBL?

1. Should take on responsibility of own learning
2. Should participate in teaching
3. Should have a positive attitude
4. Should be open to feedback

Included in this section are the following references:

Neufeld VR and Barrows HS. The "McMaster Philosophy": An Approach to Medical Education. Journal of Medical Education, Vol. 49, Nov:1040-1050, 1974
http://journals.lww.com/academicmedicine/Abstract/1974/11000/The_McMaster_Philosophy_an_approach_to_medical.4.aspx

Lohfeld L, Neville A, Norman G. PBL in Undergraduate Medical Education: A qualitative Study of the Views of Canadian Residents. *Advances in Health Sciences Education*; 10:189-214, 2005. <http://www.springerlink.com/content/776427415h097k24/>

Solomon P. Problem-based Learning: A review of current issues relevant to physiotherapy education. *Physiotherapy Theory and Practice*. 21(1):37-49, 2005. <http://informahealthcare.com/doi/abs/10.1080/09593980590911499>