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Problem-based Learning PBL

A short Introduction

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Faculty of Medicine
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Studienplanung

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1. General aspects of Problem-based Learning PBL

1.1 History of PBL

The origin of Problem-Based Learning, PBL, goes back to 1920. Celestin Freinet (1), a primary school teacher, came back injured from World War I. He saw himself incapable of speaking and teaching in front of a class for extended periods of time. His injuries forced him to seek a new methodology that would allow him to continue his professional activities in a satisfactory way (1). He established a system, in which the pupils played an active role in learning. Mainstays of this approach were communications skills, cooperative learning, self responsibility and self evaluation of their learning process: all elements and features of PBL.

The modern history of PBL goes back to the 1960s, where several schools used similar methods for educational questions. However, the credits for introducing the first PBL-Curriculum belongs to the Mc Master Medical School in Hamilton, which started in 1969 (2). The first European PBL – curriculum was introduced 1974 in the University of Maastricht Medical School. Today, PBL is widely spread in different fields of higher education. In medical schools it is mainly used in the pre-clinical curriculum.

1.2 Adult learning

An important difference between child learning and adult learning is, that children are much more intensely affected by new experiences than adults. Adults have an infinite amount of experiences to fall back on. Yet, for both, learning is retention and transfer. Evidence from cognitive psychology shows that learning (3) results from i) assimilation of new knowledge into existing experiences, ii) depends on meanings and recognition, iii) includes emotions, and iv) is an active process. Thus the question, how well we remember content and new information, heavily depends on the context, in which a topic may have been reported, stored and retrieved. If it is desired that teaching should have a long term effect, then a number of prerequisites must be considered. Relevant contextual knowledge is needed for understanding: Providing variable, but relevant, context is important for learning. Loose facts have nowhere to go and are lost. General skill does not exist – it is all embedded in

knowledge. Competence comes from the interplay of experience and formal knowledge (4; 5; 6; 7).
Galileo Galilei 1564 – 1642 said: „ it is impossible to teach a person, we can only help him, to do it himself"

1.3 PBL

Problem- Based Learning (PBL) method seems to match to a great extent with all the knowledge about adult learning and research results from cognitive psychology on adult learners (9, 10)

What is PBL?

PBL is an instructional, student-centred strategy in which a group of 6 – 10 students confront a well described problem and strive to find the right solution. A tutor pursues and supervises the process.

How does it function?

Students are presented a problem (written case, videotape, picture etc), that is textually embedded in their momentary learning topics. The tutor is the only one in the group who has a catalogue of learning items concerning the problem and the solution of the presented case. The composition of the group members and the tutor remains the same for a certain time period.
Students try to recognize the main issue of the problem. Falling back on their knowledge they strive to explain the underlying phenomenon. Beyond that, students search for fitting hypotheses to solve the problem. After having exchanged, discussed and gathered together all the existing knowledge on the problem, students will recognize that many issues and questions can't be answered in a satisfactory manner and in the demanded profundity. These knowledge gaps are formulated as learning items and are prioritized. Through self-study each member of the group acquires the lacking aspects for the purpose of catching up on each learning item, in order to explain the case. Sufficient self-study time must be placed at the student's disposal in a PBL-Curriculum. In a second meeting, students will then present their results and all the new information gathered together to solve the problem in desired profundity and epics.

How is PBL organized?

As already mentioned, small groups of students, ideally not more then six, meet twice to cover one case (= tutorial). In between these two meetings, the curriculum must provide enough self-study time, free of any other instructional duties. It is optional whether one or two cases are investigated per week. Additionally, PBL requires ample library resources, adequate tutorial rooms for the students, self-study places and a duly number of well trained tutors, one for each tutorial group.

The tutor

The tutor is a member of the academic staff of the faculty, and well trained in the process of PBL-tutoring. He, in contrast to the students, is aware of the learning goals and has profound knowledge on the cases he pursues. Results from the field of educational research suggest that both subject-matter knowledge and process-facilitation skills are necessary for effective tutors. The tutor makes sure that the learning goals are achieved. He observes the group process and the intellectual and social exchange within the group. He is not actively involved in the problem-solving process, but steers the group to effective goals. He is not an informant, nor a teacher (11, 12).

1.4 What are the main goals of PBL method?

PBL fosters the ability to identify personal information gaps, namely to seek and organize new information on account of described problems for a particular application. Furthermore it promotes autonomous learning and personal responsibility. Cooperative working in tutorials sharpens the skills for social behaviour and constructive communication. Contextual learning, a consequence of learning based on problems and cases, positively affects long term memory and supports competence in the application and transfer of knowledge on different concepts (8).

1.5 Assessment in PBL curricula

Assessment is a crucial component in education and dramatically affects the way of learning and exam preparation. Hence assessment should pursue some principles: Assessment should be I) consistent with the curriculum, II) instructive III) landmark learning strategies and IV) should contain contributions from all persons concerned (students, teachers, tutors). In PBL curricula content, process and skills are closely

linked together. Hence assessment must take into account all aspects. There are two main types of assessment: I) Formative assessment aims at continuous feedback on student progress. II) summative assessments test in retrospect the performance of students and thus allow conclusions on passing or failing a course.

2. PBL in the Faculty of Medicine at the University in Berne

In the early nineties, the Faculty of Medicine in Berne reached out for new didactical systems to meet current demands on part from students as well as teachers. The main goals were to overcome the student's passive attitudes, consumerism and their lack of competences. Another aim was to ward off teachers to inundate students with heaps of incoherent factual knowledge. Medical study should aim to learn conceptual thinking based on facts, interactivity and concentrate on medically relevant contents from day one onwards. PBL was supposed to be the didactical form to meet these demands. Since 1996 the entire preclinical medical curriculum in Bern is based on principles underlying the PBL method. Each year of the first three preclinical years is split in thematic interdisciplinary modules of different length (13). Teaching units per week are tutorials, few lectures, practical skill labs and self study time. Learning items out of all these units are cleared in self study time. The investigation of one certain topic through different teaching and learning units gives students a deeper and more profound view into the topic and its different applications. Students are given support by consulting hours, internet question forums and by packages of training questions.

Formative assessments accompany tutorials and practical skill units. Summative exams consist of an oral course and a written part based on multiple choice questions. To complete one study year, each year students must have accumulated 60 credits, following the European performance standards, and successfully pass the exams. Credits can be collected in different teaching units and in the exams.

Internetadresses

www.studmed.unibe.ch

http://www.crus.ch/deutsch/lehre/ects/struktur.html

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