



Construction of PBL Problem Base Pattern Based on System of “Two Types, Six Aspects and Three Levels” at Medical College

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Abstract

PBL is a studying process that emphasizes how to enquire, understand and solve problems. Problem Base is a form of resource for PBL's implementation and is indispensable to the overall practice of the latter. This article first sets about the two types of problems: disciplinary and conditional to collect problems from 6 aspects-- teacher's reflection, students, colleagues, teaching supervision and reference literature; then manages the problems from 3 levels – junior, middle and senior--according to the above mentioned two types, and finally constructs a problem Base of “two types, six aspects and three levels”.

Keywords: PBL, Problem base, Medical College

Problem-based learning (PBL in brief) is a learning strategy characterized by self-directed active learning starting with “problems” or “inquiries” that learners themselves identify. In problem-based learning students meet an “ill-structured problem” before they receive any instruction. In the place of covering the curriculum, learner probe deeply into issues searching for connections, grappling with complexity and using knowledge to fashion solutions. Nowadays PBL is considered as an excellent instructional method that can cultivate students' critical thinking, develop their abilities to analyze and solve problem.

1. Parameters for PBL

While there are many possible formats for presenting problem-based learning units, the following principles remain consistent: In a PBL unit, the ill-structured problem is presented first and serves as the organizing center and context for learning; The problem on which learning centers: is ill-structured in nature; is met as a messy situation; often changes with the addition of new information; is not solved easily or formulaically; does not always result in a right answer; PBL classrooms: students assume the role of problem-solvers; teachers assume the role of tutors and coaches; In the teaching and learning process, information is shared but knowledge is a personal construction of the learner. Thinking is fully articulated and held to strict bench marks.

2. Necessity of building PBL problem base

2.1 Characteristic of the problem

There are three basic elements in PBL: the problem situation, students and teachers. Among them, the problem situation is the core of curriculum organization and generally bears the following characteristics summarized: (1). the problem which is extracted from the relative concepts and theories is the starting point and guidance for study; (2). appropriate for learners. A good problem should be based on an analysis of students' current content knowledge. If a problem is to serve as a stimulus for higher-order and critical thinking, students must find the problem to be challenging (Dutch, 2001). Therefore, professors should assess students' current knowledge of the content inherent to a problem and design that problem slightly beyond what students currently know. As a result, students will not be able to solve the problem without slightly extending their knowledge base and their skills. This extension will move students beyond simply regurgitating what they already know; they will have to develop a deeper (or broader) understanding of the content to solve the problem at hand (Duch, 2001). (3). Ill Structured. Closely allied to this issue of appropriateness for students is the issue of problem structure. Jonassen (2000) notes that problems generally can be characterized as either well

structured or ill structured. Well-structured problems can guide students toward salient processes in a course and can be effective for demonstrating simple rules, concepts, and procedures. The solutions to well-structured problems are ones the learners can find from limited sources. Ill-structured problems, on the other hand, are messy like the problems that are faced in everyday life and in professional practice (Delisle, 1997; Duch, 2001; Jonassen, 2000). Not all the elements of the problem are known, and ill-structured problems possess several solutions or perhaps no solution. Ill-structured problems also are not confined by discipline boundaries (Stinson and Milner, 1996), so students may need to draw from a number of different fields to solve the problem. (4). Authentic. As professors consider authentic slants to problems that serve as the basis of PBL, they should be aware of two aspects of authenticity. First, in some respects, the problem is authentic only if it is grounded in students' experiences. That is, if a problem is too theoretical and out of touch with students' experiences and daily lives, they will not be engaged by the problem (Delisle, 1997; Mayer, 1998). Second, even if a problem is not based in students' current experiences, it may be authentic if it relates to students' future plans and expected careers (Delisle, 1997; Stinson and Milner, 1996). PBL problems should be more than theoretical exercises. Professors should design problems that require students to apply content in ways indicative of emerging professionals. Promote Life-long and Self-Directed Learning. To some extent, a problem that meets the other criteria offered in this section will likely motivate students to become life-long and self-directed learners. That is, if a problem is appropriate for learners, authentic, and requires collaboration, then students will feel empowered and understand the ways that problem-solving skills can benefit them throughout life. (5). requires collaboration. If the professor's goal in designing the problem is to foster higher-order activity among students, then the problem should be relatively ill structured. (6). it should come from real life, increases with the growing material and can stimulate learners' motive for study therefore prompts learners' increasing improvement.

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2.2 Importance of the problem

An intense sense of problem is a prerequisite for creative thinking; however, it is not inborn and needs cultivating and stimulating. Einstein emphasized, "It is more important to discover and describe the problem than to answer it. To think over the problem from a different angle, which requires creative imagination, marks a real progress in science". PBL instructional methods permeate problems throughout the whole study process, instruct students to "arouse doubts, to learn to question, to be good at solving problems and to be skeptical constantly"; besides, the problem Base just collects valuable problems. Consequently building the problem Base is of significance to PBL instructional methods both theoretically and practically.

2.3 Building problem base provides important guarantee for PBL's effects

PBL emphasizes understanding and problem-solving in the study process while traditional medical teaching stress students' command of the subjects systematically, which makes it difficult for medical PBL teaching to design sequence and degree of difficulty of problems. So, in order to ensure PBL's effects, it is especially important to build a PBL problem Base. The so-called "problem Base" mainly refers to a provision of problem material for PBL's implementation; it decides the value of teaching substance and its design determines the effectiveness. The problem Base frequently functions as an important yardstick to measure the result and level of medical teaching.

3. Construction of problem base model ("two types, six aspects and three levels")

The problem Base under the model of "Two Types, Six Aspects and Three Levels" is founded actual, practical, creative, related with students. It can be divided into two types-- disciplinary and conditional, within each of which 6 aspects are considered. In other words, problem material is collected according to the following factors: teacher's reflection, students, colleagues, teaching supervision and reference literature, and finally an operable Base model is constructed.

3.1 Content of problem base under "two types"

3.1.1 Subject-based problem Base: Based on features of different courses, it is established from an ill-structured problem Base to design courses, to choose concepts and eventually to prompt students' ability to adapt to different situation by applying what they have learnt. Its traits are as follows: First the problems' degree of difficulty corresponds with students' cognition with not only offering raw material for their thinking but also directing their analysis; Second with the up-to-date substance, it can effectively stimulate students thinking; Moreover, the problem Base should be appealing with rich and colorful contents.

3.1.2 Condition-based problem Base: It mainly includes two kinds of problems in PBL practice. The first type is problems for teachers to solve, such as how to warm up, how to teach as "guides and prompters" and what kind of pattern should be employed to motivate students to resolve problems; The second type of problems is for students: how to manage a small group, how to conduct literature search to utilize information, how to introspect the motive for study, how to team work and how to carry out lifetime study.

3.2 Six aspects for problem collection and construction of problem base

Through 6 aspects-- teacher's reflection, students, colleagues, teaching supervision and reference literature, problems collected are divided into two types: disciplinary and conditional, thus a problem Base is constructed.

3.2.1 Perspective provided by teaching monitoring system: By a monitor system a teacher's classroom teaching with PBL application is thoroughly videotaped for academic leaders, trainers of PBL, his peers, the teacher himself to analyze and discover problems.

3.2.2 Perspective provided by teachers' reflection. Teachers recall their own feelings when they were students and summarize their experience and lessons as teachers to find out problems.

3.2.3 Perspective provided by students. Students are asked to share their feelings during the PBL teaching process for their teachers to discover problems.

3.2.4 Perspective provided by colleagues. Colleagues are asked to give their opinions on the mark about PBL's implementation in the case videotaped.

3.2.5 Perspective provided by supervisors. Supervisors are asked to comment to the point on PBL's implementation in the case videotaped to find out problems.

3.2.6 Perspective provided by educational documents. Resources of problems are achieved by reading educational documents and acquiring some beneficial enlightenment.

3.3 Management of three levels for problem base

Based on the two types and six aspects for problems-collection, the problem Base is divided into three levels—junior, middle and senior for management. The junior problem consists of original problems without being sieved or proved. The middle level of problem Base includes the problems analyzed, compared and picked or even abstracted, summarized and defined after their general characteristics and essence recognized by experts from the junior. The senior problem Base is a higher resource comprised of problems in the middle level which have validated in practice, re-examined and re-arranged from a new angle and with a new standpoint.

4. Reflection

With the construction of the problem Base, teachers and students have a definite direction for thinking and a strong desire to solve problems. It provides not only a motive for internalization of objective knowledge but also a prerequisite for externalization of subjective knowledge. It is one of happily accepted research forms for teachers from grassroots level to instruct teachers to establish a problem Base systematically. The course of teachers' drifting, extracting and accumulating problems is one process for them to constantly summarize their own experience and learn from others' strong points. During the whole process of accumulation and integration, teachers would gradually intensify their zest into PBL teaching theories and their improvement steps into a good circle when they can voluntarily construct a problem Base with the support of educational theories. But how to further explore the implementation of PBL problem Base, there is still a long way for us to go.

5. Future research of problem-based approaches

Further research in four areas would deepen present understandings of problem-based approaches to professional development.

First, further research of the role of independent learning activities in facilitating learning should be conducted. The case study approach is often the favorite choice of trainers because it requires the least amount of training time. In large part, this time saving is realized in the case study approach because trainees are not required to engage in independent learning activities. More needs to be known about the trade-off between engagement in independent learning activities and the development of problem-solving skills. Second, further study of the facilitator role in problem-based approaches is warranted. Areas for future research should include the influence of technical expertise in facilitating problem-solving groups, the role of cognitive, metacognitive, and procedural guidance during group problem solving, and the impact of facilitator training on trainers with varying levels of technical expertise. Third, additional research focusing on the influence of computer technology on group problem-solving activities needs to be conducted. Some professional development programs deliver problem-based approaches through communication and multimedia technology, even though a substantial body of literature suggests that the effective performance of problem-solving and decision-making tasks requires information-rich media. Studies addressing the strengths and limitations of communication and multimedia technology for facilitating problem-solving activities would help clarify this disconnect between theory and practice. Finally, previous theory and research indicates that problem-based approaches to professional development show much potential for promoting the problem-solving skills of professionals in today's organizations. However, relatively few empirical studies have examined ways of assessing higher-level cognitive outcomes in problem-based approaches. Most reports of problem solving skills development have been based on subjective self-reports of trainees and assessments of trainers (Albanese and Mitchell, 1993). Finding objective ways to assess problem-solving skill is

necessary to gain a more complete picture of the role of problem-based approaches in promoting the development of professional expertise.

References

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Notes

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