KEY INGREDIENTS FOR EFFECTIVE PROBLEM-BASED LEARNING LESSONS

By

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ABSTRACT

It has been well recognized that problem-based learning (PBL) embraces the principles of what constitute good learning and teaching, which encourages integrated, independent and experiential development of a number of skills including team work and communication. The question is how best can the PBL approach be implemented to ensure maximum gain of deep learning? Two issues that need to be addressed are: the problem itself and the sagacity to get involved around this problem. Mindsets need to be changed in terms of appraising students' performance.

INTRODUCTION

If teaching means helping someone else to learn, then we ought to consider what constitutes learning. Learning, as proposed by Fincher (1994) can be defined as a process of progressive change that takes one from ignorance to knowledge, and then from inability to competence, and finally from indifference to understanding. Thus learning is a consequence of thinking, driven by a desire to make sense. It is very much a reflective process which requires the appetite to seek knowledge and the knack to question in order to acquire different layers of understanding. While we all agree that there are different means of achieving that purpose, little attention has been given to the fact that there are also differences in how students learn, although there is literature on how to teach effectively and on how people learn (Wood, 2004).

One of the major concerns often cited by leaders and policy makers is that our graduates lack skills and competencies in communication, critical thinking and problem-solving required by the industry, raising questions about gaps between what is learned in higher education institutions and what is needed in the workplace. What is then lacking? A simple excuse would be to say that it is because most higher education practitioners hardly receive any kind of training in the art of teaching. It was assumed that one should know how to teach. Therefore it is not surprising to also assume that in most cases one teaches according to what one has been taught before and so the process goes on with little reflection on the appropriateness and effectiveness of the method except for the outcome at the end of the term of study. This has led to reasons like, "why some students may have suffered from what is termed as the unchallenged learning syndrome?", and "why they would never have the opportunity to unleash their hidden talent and potential?" (Hashim and Awang, 2005). Only recently educators began to explore the different approaches of teaching that focuses more on promoting the involvement of students in learning. One such method that has been widely implemented in medical schools and science based curricula is problem-based learning (PBL). This paper examines the concept of PBL and offers what are necessary ingredients for the effective implementation of PBL.

PBL in Brief

PBL is about developing learners who "get-up-and-go". According to Deepak (2005) "doing" is the key to learning because research shows that children retain 75 percent of what they see and do, compared to 40 percent and 20 percent of what they see and hear, respectively. This is indeed in total agreement with the Chinese proverb, "Tell me and I forget, Show me and I remember, Involve me and I understand". It represents a continuum of pedagogical strategies ranging from the traditional instruction of rote learning to interactive facilitation of promoting self-motivation for active learning, the latter of which being the essence of PBL. It is no wonder that the traditional method of lecturing had bypassed a lot of the hidden potential because, by involving oneself, one

reaches the level to comprehend and to retain what has been learned. In PBL, one develops a range of skills including analytical and critical thinking, problem formulation and communication skills which are necessary requirements for a graduate entering the world of work.

PBL is broadly described as a learning approach to curriculum that is problem centred rather than discipline-centred (Boud, 1985) and characterized by principles that significantly differ from the traditional subject-based curriculum (Martin, 1996). The features of PBL include the following:

- cumulative learning - content is not learned in-depth at one time, but is introduced repeatedly and in increasing levels of complexity during the course of study.
- integrated learning - contents are introduced as they relate to a single problem rather than separately.
- cooperative learning - students learn through dialogue and discussion in small groups.
- progression in learning - what and how students learn to change, as students acquire more skills and knowledge.

Since the purpose of PBL is to reinforce understanding, students construct their own meanings and explanations through active involvement with the subject-matter to be learned. The form of PBL in operation in curricula can mainly be differentiated by the ways in which learning and the role of the students and teachers are enacted within those curricula. The different modes summarized in table1,represents a range of approaches that accommodate the various learning outcomes, the increasing level of students' involvement, self-direction and independence, and the decreasing instructor intervention, instructor-determined structure and guidance (Savin-Baden, 2003).

Implementing PBL

The focus of PBL as has been recognized is on the process by which students acquire the knowledge using problems that constitute the contents or the subject matter requiring them to take responsibility for their own learning and encouraging them to engage in deep learning. A lot of issues have been debated about the approaches and the necessary requirements for successful implementation of PBL. The important issues among others are the changing role of teachers from information giving lecture mould to resisting the temptation to supply information, and converting the students from being passive recipients to active participants.

Modes of PBL	Learning	Students	Teachers
PBL for Epistemological Competence	The use and management of a propositional body of knowledge to solve or manage a problem	Receivers of knowledge who acquire and understand propositional knowledge through problem solving	A guide to obtaining the solution and to understanding the correct propositional knowledge
PBL for Professional Action	The outcome - focused acquisition of knowledge and skills for the work place	Pragmatists induced into professional cultures who can undertake practical action	A demonstrator of skills and a guide to 'best practice'
PBL for Interdisciplinary Understanding	The synthesis of knowledge with skills across discipline boundaries	Integrators across boundaries	A coordinator of knowledge and skill acquisition across boundaries of both
PBL for Transdisciplinary Learning	Critical thought and keeping apart oneself from disciplines in order to understand them	Independent thinkers who take up a critical stance towards learning	An orchestrator of opportunities for learning (in its widest sense)
PBL for Critical Contestability	A flexible entity that involves interrogation of frameworks	Explorers of underlying structures and belief systems	A commentator, a challenger and decoder of cultures, disciplines and traditions

Table 1. The different approaches accommodating learning outcomes

The varying degrees of the roles of both the teachers and students depend very much on the mode of PBL as presented in table 1, which in turn depends on the will to know and the will to become. However, for any PBL approach to be effective, that is, for meaningful learning to take place through problem-solving process, the problem itself is the most important consideration because by definition, in PBL, the starting point of learning should be a problem. The second key ingredient is huge amount of sagacity to work around the identified problem or what Hashim and Awang (2005) refer to as gumption.

The starting of problem of concern must necessarily be real life problems within the context familiar to students. In other words, a problem that relates to a certain issue will be different in different settings across regions, states, ethnicity, cultures, and thus should be dealt with difference. This is the only way how students are able to appreciate what is being put forth to them to engage them in deep learning and understanding. In a way looking for a problem is like searching for a research question while conducting research. The approach can be directed through the factors that are bothering a person about a certain topic that ignites to search and re-search to arrive at a solution or solutions. The process would include analyzing the situation, reading the literature of the other similar or related problem, collecting data and analyzing them, evaluating the options and finally making the decision to arrive at the most plausible solution. Along the way students directly and indirectly learn to think analytically, critically and creatively, develop communication skills, work in teams, reflect on what they have observed and experienced. Because in reality a problem is rarely solved by an individual, so it is best that if students are assigned to work in small groups to enable brainstorming and discussion sessions, as it will generate lots of ideas and learning questions.

Effective implementation of PBL requires commitment from both the teachers and students in not only identifying a suitable problem to the topic of interest but also in carrying the problem through to the end. For this reason, teachers and students would have to have plenty of gumption to be able to withhold the momentum and the motivation to continue seeking for information and answers. As described by Pirsig (1974) gumption is like the psychic gasoline that keeps the whole thing going. There needs to be mutual reinforcement between the teachers in providing guidance and feedback in response to the questions and findings by the students.

Another important issue to remember is that while engagement in deep learning is encouraged, it will not be meaningful to the students if the system of rewarding them does not match their efforts. For this reason, performance evaluation has to move away from the conventional project paper, report style and examination to a set of criteria where students are allowed for self-reflection, to ponder on what has been learned as they progress from one aspect of the problem to another, do a critical analysis of group dynamics and finally the cumulative achievement at the end. Subsequently the teacher will evaluate these points to arrive at the final assessment bearing in mind that there is no one standard or correct answer. This allows for the different ways and pace that individual students learn to be taken into account.

Conclusion

If teaching is to help students to learn and train the next generation, then it is the teacher's duty, to consider how to teach effectively and efficiently. PBL helps for it, as it is teaching towards learning that results from working with problems. It is an instructional strategy in which students confront contextualized, ill-structured problems and strive to find meaningful solutions. Thus, seen as a rectification of cognitive processes, in a problem-based approach, teaching and learning involve intellectual commonalities between teachers and students. It involves knowing how to work with groups as well as how to train groups to work with each other. It also involves knowing how to guide without seeming to be hiding the answer as well as posing authentic problems - problems with a certain open-endedness about them.

No teacher and no student can work in isolation. The way the world works now, it's about working together. Students learn about collaboration, different approaches to a problem, cooperation and responsibility and this makes their learning in PBL lessons richer and deeper.

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