PROBLEM-BASED LEARNING:
AN EXPERIENCE FROM A THAI MANAGEMENT SCHOOL

Chatchai Chatpinyakoop
College of Management, Mahidol University
69, Vipawadee-Rangsit Road, Phyathai, Bangkok 10400 THAILAND
E-mail: cmchatchai@mahidol.ac.th
Tel: +662-206-2000 Fax: +662-206-2090

Category:
Experience-based paper

Paper prepared for presentation at the
M/O/T/ 2010 International Conference on Management Learning
Vienna, Austria, December 1-4, 2010
PROBLEM-BASED LEARNING:
AN EXPERIENCE FROM A THAI MANAGEMENT SCHOOL

Chatchai Chatpinyakoop
College of Management, Mahidol University
Bangkok, Thailand

Abstract

The traditional way of learning relies upon the sharing of lessons from the past. Sometimes, however, the situation being addressed is unique and the past does not provide a good solution. Experience- or Problem-based learning offers greater promise in these instances. The Buddhist scripture of Kalama Sutta suggests that one should not easily believe in anything, but instead experience it by oneself. Piaget’s Constructionism, Dale’s Cone of Learning and Kolb’s Experiential learning theories all rely on the idea that practice is a good learning mechanism. Learners are able to understand the lesson by taking a holistic view, incorporating new experiences into their body of knowledge. A study by an MIT researcher found that even uneducated people in Thailand could learn or create their own knowledge with this approach with technical support utilizing basic computer and calculation skills to learn and solve problems.

This study considers the use of Problem-based learning (PBL) as a learning strategy through a computer-based simulation at a Thai management school. Learning begins with an understanding the problem and its context, not with theory or concepts. Solutions are discovered through practice. Though teams share common goals, their strategic implementation may be different. Learners learn through interactive simulation, not unlike playing of a computer game. Through trial and error, participants reach decisions with minimal pressure, as bad decisions do not incur negative costs. Instead, risk-taking within a simulated world offers learning rewards. Learners also benefit themselves and others through sharing their personal experience with their team and developing understanding of the concepts and theory underlying the exercise in a natural way. Participants enjoy learning through play, a successful utilization of Problem-based learning.
Introduction

Traditional learning relies upon the sharing of lessons from the past, but cannot fully anticipate the future or consider the context of decisions. In real business situations, however, decision-makers frequently confront unexpected events. Leaders in this environment must rely upon prior experience and consider other aspects of the situation. In short, leaders must be ready for and responsive to change. Problem-based learning (PBL) is an approach that recognizes these other aspects of situations.

Concepts

Problem-based learning (PBL) is a learner-centered teaching method where learners collaborate in team problem solving and share what they learned through their experiences. (“Problem-based learning”, 2010) The motivation of learning in PBL comes from the significant involvement of learners in the problem situation. This heightened involvement requires that learners involve their intellect, their senses, feelings and personalities. (Andresen, Boud and Cohen, 2000) Such participation serves to initiate learners’ process of knowledge inquiry and understanding. Lessons from PBL create something meaningful to learners. Learners can focus and enjoy their study through this process. Learners are encouraged to make mistakes and perceive it as a good lesson.

Kolb (1984) defines experience-based learning, an interchangeable term for PBL, as a transformational learning process where knowledge is created through the transformation of experience from concrete experience, abstract conceptualization, reflective observation and active experimentation. The first two modes of the process are considered grasping experiences while the other two modes are labeled as transforming experiences. This continuum can be evolved and learners can learn at all times.

Other literature also supports experience-based learning. For example, the Buddhist scripture of Kalama Sutta\(^1\) (Sujeera, 2007) suggests that one should not immediately believe in what has been taught, what has been told or written even from trustful sources. Instead, one should believe in what one can experience. Dale (1969) ranked the direct experience learning\(^2\) as the most effective learning method. Contrasting with other learning methods, experience-based learning is more realistic and more practical.
Petcharak (2001) studied experience-based learning in Thailand using Papert’s concept of Constructionism. Petcharak noted that intelligence is not only an innate internal characteristic, but can also come through direct experience. Learners create their own knowledge by constructing or creating something by themselves, a product of the interaction between the person and the environment. The new knowledge from the learner’s experience will be assimilated with the existing knowledge, then combined and accommodated into the learner’s new body of knowledge. Experience-based learning requires learners to think, be active and responsible for learning. This is natural and can be initiated from learner’s positive attitude. Learners will learn more enthusiastically if they have a positive attitude towards learning. On the other hand, recitation, where learners are forced to memorize, is an example of a negative learning attitude. Teachers can encourage learners to think continuously until it becomes a lifelong learning spirit. Papert (1993) also believes that digital technology and internet are good supporting tools for experience-based learning because it creates common interest to support learning in groups.

**Empirical Study in Thailand**

Cavallo (2000) finds that experience-based learning is indigenous. Cavallo found even uneducated villagers in rural Thailand were capable of solving their own problems if provided with clear guidelines and appropriate technological support. In the study, villagers were faced with a water management problem. After they learned some skills, including basic computer training, the participants found that they had built the reservoir in the wrong place. Building the new dam in another location was more effective than relocating the irrigation hoses. Cavallo addressed the reason why people can learn and solve their own problems without education background when they actually live with the problem and are thereby motivated to seek a better result. He also discovered that rural people in Thailand have the hidden learning potential and the vision of “engine culture” to solve their problems reflected from their inventions. This can be seen as either a survival skills from responsive demands to contextual (Kolb & Kolb, 2005) or local wisdom. This provides a prime situation for successful Problem-based learning.

The Cavallo research identifies technology fluency and immersive environments as two necessities to foster good learning environments. Technology fluency means that
learner has the substantial understanding of technology in order to learn and solve their own problems utilizing technology. They have to understand technology as their own language because people can think, imagine and communicate best with their own language. An immersive environment is one of involvement; a learner can improve their learning if they are immersed in the environments or situations. In this study, villagers realize and solve their problems well because they are living with the problem. This is analogous to the situation that the son of a pianist who can learn to play the piano better than others because he is able to see and hear his father practicing piano everyday, which influences his own attitude.

In this empirical study, learning from the actual situation is efficient. But in some conditions and situations, it might not be. Pilot training, medical training and criminal practice training are samples of risky and dangerous activities that cannot learn through interaction with real-life experience. In these types of environments, simulated situation learning, can be an interesting alternative. Technology enhancement creates personal experiences that serve to initiate learners’ own process of inquiry and understanding, can become an interesting alternative.

A practical example: PBL simulation in a management school in Thailand

This section will discuss the practical application of PBL with computer simulation in the university learning environment. Mahidol University’s College of Management adopted PBL in the course Consulting Practice: Organizational Change (CPOC), which has as its objectives the understanding of how to think about change and manage implementation (Hallinger, 2005). The course utilized a computer simulation called “Making Change Happen” invented by Hallinger (Hallinger & Bridges, 2007).

Pedagogy

The computer simulation required learners to manage the change process of an organization seeking to implement new software in three pilot branches with 24 staff over a three year time horizon. The implementation budget available for each year is limited, less available, and non-transferable into consecutive years. The course begins with description of the problem, with learners assigned to be consultants to manage this
change. With their different consulting roles, learners would learn how to think, solve the problem and share their different views in small group discussion.

The team assignment had two goals: to maximize the number of routine users of this new software and improve the overall effectiveness of the organization measured as “bennies” in the simulation. The theory and rationale was not provided at this initial stage; it was only summarized through learner’s direct experience at the end of the course. Learners will begin play with only this information and will learn throughout the process with a PBL methodology. Even though the task faced is not the actual situation, the problem and learning method are more open, less complicated and appears to be real. Learners must depend on their own experience, analytical skills as they immerse themselves in the learning process.

In-class learning activities

The set up of the learning environment of this course was intended to be in small group. Learners worked in groups no larger than three persons. The small group environment provided natural motivation with low pressure and a friendlier learning atmosphere. Larger groups were not encouraged because it reduces the quality of idea sharing and discussion flow.

Each team sets their ultimate goals for the end of the three year simulation, and then prepares their strategy and implementation plan for the first year. The teacher guides learners to understand the background information and then consider for only a short term planning.

Different teams may come up with different strategies and implementations. Some team may plan for high progress of people while some others may aim for high bennies in the first year. These alternatives are all possible in the simulated environment. Learners usually experiment with different plans and activities. The plan may not always be successful on its first attempt. At this stage, learners will learn to manage and handle the changes systemically and learn the best sequence for managing change, specifically what should be done first, what can be done later, and appreciate the whole implementation process.

The computer simulation evaluates interactively each group’s decisions and provides on-screen feedback. Feedback also depends on the team’s earlier moves and
their overall progress in addressing the problem. Learners learn from consequences of their decisions and use this feedback in group discussion to modify their team’s strategy. They learn from the results of their early decisions and can reflect on different behaviors. In doing so, the students realize that, as managers, they should consider doing the best practical solution to that particular situation, rather than the best and there is more than one solution to the problem.

The discussion is another important aspect of the learning opportunity. Small group discussion facilitates development of a better strategy than solving the problem alone would allow. Through observation of the feedback to their short term planning, learners can analyze their progress to their goal and set the plan for next move. This is the debugging stage of learning and is analogous to the “Check” and “Act” in Deming’s PDCA cycle (Deming, 2000)

**Sample from the simulation**

The simulation screen above depicts the whole path of change. It is divided into five stages: information, interest, preparation, early use and, lastly, routine use. Learners will have to set the plan and strategy to implement the change with activities listed on the right. All staff members are listed on the left-most part of the screen. Learners must first plan to
move them through the five stages of change. Another goal is to increase the effectiveness of this organization reflected in “Bennies” currency showed on the top right corner of the screen. Each activity has its own cost and conditions. Some activities affect only a single branch, while other activity has region-wide effects. Learners can monitor how much budget (in bits) they have remaining in the current year on the right of the screen. Throughout the implementation process, learners learn from their choices through the simulation’s feedback. For example, learners choosing workshop as their first activity, will find the feedback card reproduced below on their screen:

"The Branch Manager has not encouraged you to conduct activities in this branch. Therefore, you cannot get permission to offer workshop in this branch yet. Talk to the branch manager some more to get support. They you could try this again. (No one moves.)"

Source: Making Change Happen Simulation

The lesson derived from this example from the simulation is that a mass-participative activity like a workshop is not appropriate as the first activity to put the change into effect. Rather, change starts with the idea of “think big, start small”. Change managers should start small with the simple action of talking with the authorized persons because this implementation needs the authorized support and approval before conducting any other activities. An immediate collective activity like a workshop will be resisted at an early stage.

Learners also become aware that it is important to understand the adopter levels of the supporting staff. Initially, only a few people will be cooperative after speaking with them only once. At the other extreme, even repeated activities will not be sufficient with people who heavily resist the change. Resistance to change is natural. Managers have to
bear this in mind. This is evidence of the immersive environment of the simulation; participants take on the perspective of someone actually in the situation portrayed. When learners solve the situation, they see themselves as the real consultant solving the problem for this organization. With the available budget, tools and activities, they apply the best practice to the situation in the short term in order to fulfill the long term goals they have set. Learners will realize that the implementation needs to be planned and conducted step by step. Change is the process, not an activity.

In this manner, learners better understand the results from their own practice in simulation. After a few classes, with all teams practicing through the end of year three, the lecturer will allow every team to visit other teams to observe and exchange their practical experiences. The lecturer may guide learners to observe why different teams, starting with similar ultimate goals and resources, can come up with different consequences at the end of year three. This is because each team utilized a different strategy and more than one solution exists to the problem. This is a good lesson applicable to the real business practice.

Student practice the simulation with their team for six weeks. The more they practice, the more experience they will gain and sharpen their analysis. Finally, the groups summarize their learning through a team-based report, which analyzes their group’s approach to change management over the three year time horizon of the simulation. They then reflect their lessons and analyze what could be improved, if they were given another chance to implement the change again. Each learner also wrote an individual reflective essay, to demonstrate how they applied lessons learned with real experience. They can use the process learned in class to analyze their real change experience. The lecturer then combines the lessons learned with relevant theories of change management and summarizes the key lessons at the end of the course.

The teacher then explains the lessons by reference to examples from the simulation that everyone has now experienced, making it easier to follow the conclusion. The teacher may discuss both good and bad decisions. Learners can easily follow the discussion because they have had direct experience. The use of PBL provided learners with the opportunity to see the situation in the simulation and take a consultant’s perspective on resolving a real problem. This allows learners to recognize the impact of the business
environment in the overall change process and understand their roles in resolving the situation.

Within the simulation, the theories, concepts and process of change management can be more readily understood when applied to a real life setting. One student participating in the simulation remarked in the course evaluation, "I really like the simulation. It's a great tool to help us understand theory and at the same time we can try the wrong choice (trial and error) to see the next result (what will happen). Better to make mistakes here than at work" (Hallinger & Bridges, 2007) Advance of technology during the past ten years greatly enhance the potential of PBL. Telesco (2006) also supports this idea. He noticed that theorists argue that when participants are engaged in a reality-based scenario, there is an ability to move out of the cognitive realm into the emotional where attitudes and feelings can be tapped into and education and change can be stimulated. With this evidence, it can be confirmed that the Problem-based learning is another interesting learning approach for management learning.

Experience-based learning propositions with evidences from simulation

The advantage of Problem-based learning from the application with computer simulation in this paper can be summarized with reference to the propositions of Kolb’s experience-based learning theory (Kolb & Kolb 2005) and evidences in the CPOC simulation as follows:

1. **Learning is best understood as a continuous process.**
   
   **Evidence:** Lessons can be learned from every stage of the process, from pre-implementation planning through project completion and reflection. Planning in the pre-implementation phase, improvising the decision to solve the problem in the middle of the game, and analyzing and discussing lessons learned after finishing the simulation. All provide opportunities for learning.

2. **All learning is re-learning.**
   
   **Evidence:** Mistakes provide good lessons. Through trial and error, participants reach decisions with minimal pressure, as bad decisions do not incur negative costs. Instead, risk-taking within a simulated world offers learning rewards. Thus, learners benefit from their own experience.
3. *Conflict, differences and disagreement are what drive the learning process.*

   **Evidence:** The organization in the simulation has the problem of new IT implementation which required finding the solution. Solutions come through an understanding of the situation and practical application, not just the best solution.

4. *Learning is a holistic process of adaptation to the world.*

   **Evidence:** Learners solve the problem better when understanding the whole situation and background of the organization, people, business environment and situation.

5. *Learning is the result from interactions between the person and the environment.*

   **Evidence:** Today’s technology, an interactive computer simulation, can greatly enhance learning. In the CPOC simulation, the algorithm shuffles and randomizes the feedback based on the current situation. Learners will base their decision from this information.

6. *Learning is the process of creating knowledge.*

   **Evidence:** Personal knowledge can be generated by the learner. With this, the learner can gain a deep understanding and easily retain the key objectives of the lesson. In CPOC, learners realize how the outcome is shaped by their own previous decisions.

**Conclusion**

Advances in technology offer great possibilities to enhance student learning. Through PBL, learners better comprehend the whole picture, understand the connections, and can apply to a real situation. As a result, PBL is an education tool that raises the motivation for learning, and facilitates lifelong self development. PBL is an interesting learning approach that creates the “PLEARN” experience to learner. In Thai, plearn means enjoy. Plearn, here, is “Play” and “Learn” (Samudavanija, 1999). So, learning can be an enjoyable activity, which enhances its effectiveness.

**Acknowledgements**

I would like to thank Professor Philip Hallinger, Kelley Ritchey, Jamaree Amonkosolpan, Brian Hunt and College of Management, Mahidol University for their supports.
Notes
1. Kalama Sutta is a discourse of The Lord Buddha. The scripture notes that when the Buddha passes the Kalama village, the villagers ask for his advice. They say that many holy men pass through and teach and criticize the teachings of others. So whose teachings should they follow? The Buddha answers that “Do not go upon what has been acquired by repeated hearing, nor upon tradition, nor upon rumor, nor upon what is in a scripture, nor upon surmise, nor upon an axiom, nor upon specious reasoning, nor upon a bias towards a notion that has been pondered over, nor upon another’s seeming ability, nor upon the consideration, “The monk is our teacher”.

2. Dale researched learning and teaching methods and summarized the different learning methods ranked by the effectiveness of the learning. He stated that the Cone of Learning was not offered as a perfect or mechanically flawless picture to be taken absolutely literally. It was merely designed as a visual aid to help explain the interrelationships of the various types of audio-visual materials, as well as their individual positions in the learning process.

References