

***Implementing Problem-based Learning in Thai Higher Education:  
A Case Study of Challenges and Strategies<sup>i</sup>***

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## Abstract

This paper employs a case study methodology to describe the implementation of problem-based curriculum at the College of Management, Mahidol University, Thailand. We first briefly describe the implementation process. Then we present quantitative data drawn from student feedback on teacher performance in both problem-based and “traditional” classes taught in the college.

The paper shows that overall implementation of the curriculum has been successful when judged by the student response. The results suggest that it is possible to use student-centered strategies such as PBL in higher education with Thai students. The results also confirm that implementation of large-scale changes in teaching are not accomplished without encountering many obstacles both with respect to the role of teachers and students.

Until recently one of Asia's tiger economies, Thailand's economic growth ground to a halt in 1997. Among the causes of Thailand's economic crisis was the inadequacy of its educational system (Bangkok Post, 1998a, 1998b). Thailand's schools were never designed to produce the highly motivated, independent thinkers and learners demanded by an information-based economy. Indeed, many have questioned whether Thai (and other Asian students) can learn effectively using "student-centered" learning approaches designed with such goals in mind.

This paper describes the attempt of a graduate college of management in Thailand to implement a substantial strand of coursework grounded in problem-based learning (Barrows & Tamblyn, 1980; Bridges & Hallinger, 1993, 1995). Problem-based learning is a student-centered, constructivist learning method that was initially pioneered in medical education in the United States (e.g., Rush Medical School, Harvard University's School of Medicine), Canada (e.g., McMaster University), and the Netherlands (Maastricht University) during the 1980's (Barrows & Tamblyn, 1980). In the 1990's the use of problem-based learning expanded into other fields including architecture, nursing, education, law, engineering, and management.

This approach to teaching and learning represents a major departure from the norm in most countries. In Asia the change to PBL is even more radical given the norms of the social culture (Walker, Bridges, & Chan, 1996). Thus, while there is a need to understand the conditions that support successful implementation of PBL in general, implementation in Asian cultures represents a particularly interesting case.

This paper will present a case study of the implementation of PBL at the College of Management, Mahidol University (CMMU). Specially, the paper will report:

- the context in which we implemented PBL at the College of Management, including the specific challenges imposed in our environment,
- the implementation process;
- evidence concerning program success from the perspective of student course evaluations and feedback,
- future challenges that we perceive for implementation of PBL at CMMU as well as the implications of our experience for other educational institutions in Southeast Asia.

### What is Problem-based Learning?

PBL was first formally introduced by faculty in leading medical schools that were dissatisfied with the quality of the professional preparation they were providing to students. Knowledge application, problem-solving skills and attitudinal dimensions of effective medical practice were all areas that their own assessments identified as persisting weaknesses (Bok, 1989). Notably this self-critique was led by some of the top medical schools in several nations (e.g., Bok, 1989). PBL emerged as a response to these perceived weaknesses in the professional preparation of doctors.

Subsequently, the designers of PBL sought to develop an approach to learning and teaching that would address the following goals:

- Adapting to and participating in change,
- Dealing with complex, swampy problems and making reasoned decisions in unfamiliar situations,
- Reasoning critically and creatively,
- Adopting a more universal or holistic outlook,
- Practicing empathy, appreciating others' points of view,

- Collaborating productively in groups or teams,
- Identifying one's own strengths and weaknesses and undertaking appropriate remediation. (Engel, 1991, pp. 45-46)

The method that came to be known as problem-based learning emerged gradually over a 20-year period with numerous variants. However, at its heart, PBL has six defining characteristics:

1. The starting point for learning is a problem.
2. The problem is one that students are to apt face in the future workplace.
3. Subject matter is organized around problems rather than the disciplines.
4. Students assume a major responsibility for their own instruction and learning.
5. Most learning occurs within the context of small groups rather than lectures.
6. The solution to the focal problem has an implementation focus that goes beyond problem diagnosis and analysis. (Bridges & Hallinger, 1993, 1995)

Research on problem-based learning, primarily conducted in medical education, provides reasonable though not inconclusive support for the effects of this approach. Numerous research reviews have been conducted on the effects of PBL on students (e.g., see Albanese, 1992, 2000; Albanese & Mitchell, 1993; Norman & Schmidt, 1992; Vernon & Blake, 1993; Walton & Matthews, 1989). While the differential effects of PBL on learning and problem-solving remain small, there is consensus that PBL produces a more enjoyable and motivational learning environment for students (Norman & Schmidt, 2000). That said, the debate over both the optimal conditions for use, the instructional process, as well as the appropriate modes of assessment of PBL

continue (e.g., Albanese, 2000; Newman, 2001; Norman, 2002; Norman & Schmidt, 2000).

### Formulating an Implementation Strategy for PBL at CMMU

Before discussing the implementation of PBL at Mahidol University, we need to set the background. The College of Management at Mahidol University (CMMU) was started in 1997 as the Mahidol University's graduate college of management. It offers the Master of Management in a variety of management specializations, taught in English, to 750 students in its international program.

From its inception, CMMU was intended to be a center of innovation for the delivery of graduate management education in Thailand. CMMU was founded as a semi-independent unit of Mahidol University, a government university. CMMU was founded as a *hybrid* legal entity. CMMU is responsible on curriculum matters to Mahidol's University Council, but operates with its own Board of Trustees. We mention this because we believe that the College's capacity to innovate is derived, in part, from its semi-independent status.

The College's philosophy from the beginning has focused on offering personalized, student-centered learning in small classes. Despite a seemingly receptive context for innovation in teaching and learning, a closer look beneath the surface revealed a different picture. A quality audit conducted in the third year of the College's operation found the following:

- Although all classrooms were equipped with state-of-the-art teacher workstations, their usage was generally limited to using the computer as an expensive overhead projector for showing PowerPoint slides. There was

little use of the more sophisticated capabilities of the equipment such as for using multi-media, internet/intranet access, or video cases.

- Although every classroom was equipped with tables and chairs to allow easy re-configuration for team-based learning, most instructors kept the tables and chairs in traditional rows. The vast majority of in-class time remained in a traditional, teacher-directed instructional delivery mode.
- An analysis of the curriculum revealed that very little instructional time was intentionally allocated to student-centered learning.
- The only real student-centered learning was located in the thesis and Independent study coursework that comprised the required capstone of the College's curriculum. These research-directed projects were the *traditional* options offered to students in most Thai Master degree programs.

However, our faculty observed that these options did not align well with our goal of fostering ability of students to apply their knowledge.

Therefore, we did not view them as the only approaches or necessarily the best ones to achieve our vision of graduates who could apply their knowledge effectively and ethically in the workplace (Bridges & Hallinger, 1995).

When the management of the College deliberated on these observations, several conclusions were drawn. Curriculum and instructional practice in the College was not consistent with the College's stated vision. Despite its potential strengths, the College was not organizing to take advantage of them.

With this in mind, managers and faculty members deliberated upon the question of where to start in terms of instructional and curriculum development. Given the College's vision of learning focused on the practical application of theory-

based knowledge, we sought to identify instructional and curricular strategies that were suited to this goal. The senior author as well as one other faculty members had considerable experience in implementing problem-based learning elsewhere. Other faculty, though lacking formal training in PBL, were nonetheless philosophically inclined towards methods of active learning and intrigued by what they had hear about PBL. Therefore, we decided to explore the possibility of incorporating PBL into the College's curriculum.

### The Implementation Context

Our faculty conceived of the implementation of PBL as a stimulus for long-term, College-wide change in curriculum and instruction. We did not view PBL as “the answer” to educational quality problems. Rather we conceived of PBL as a systematic student-centered learning method that was consistent with our philosophy. Our intention was to employ PBL in a selected portion of the curriculum.

The debates over the role and optimal processes for management education that ensued among faculty members were no different than have occurred in other fields (e.g., Bok, 1989). Some instructors felt this approach would diminish the research focus of the College. Others argued for a more comprehensive approach to implementation of PBL. However, given the limited number of full-time faculty and the need to implement quickly, a plan emerged to add a PBL option to the current set of capstone project options of the College.

A curriculum development team formed and was charged with implementation of this project. The goal was to begin implementation within three months, in the upcoming June term 2001 as part of a six-credit, two-term course already approved but seldom used course entitled *Consulting Practice*.



While this time-line was ambitious, we believed it was achievable. Contextual factors that we took into consideration when formulating our implementation strategy included the following:

- Students would be entering their fourth term of study in their five-term program during June. Given our conception of the course as a “two-term project”, we felt it was important to start in June if we were going to begin a substantial trial implementation in the next year.
- There was strong interest and support among a key group of influential managers and faculty for implementation of PBL. Therefore, we were confident that we could depend upon a large enough group of staff to generate sufficient momentum for the June implementation.
- We already possessed two computer-based PBL simulations that focused on organizational change in Thai companies. These could be used in tandem as the first module during the June term. This meant that we could phase-in implementation of other new modules starting from August through December. That is, newly developed projects would be implemented sequentially over the course of two terms. Thus, design could take place concurrent with actual implementation. Moreover, the existing projects could serve to some degree as design models for other projects.
- The intellectual resources necessary for development of new projects and implementation were already present in the College.

Taken together, these factors meant that our decision to implement a PBL track within our Capstone Project was taking place in a potentially fertile environment. We did not face many of the usual obstacles to implementation of PBL or other new teaching methods: faculty resistance, conflict with curriculum policies,

lack of administrative support, inadequate resources, inappropriate teaching facilities, overly large classes (Hallinger & Bridges, 1995).

There were, however, several obstacles that we did anticipate. Lack of faculty knowledge and skill was one. This would be the first formal PBL curriculum development for most of the instructors. The same applied to the lack of experience in using PBL in the classroom. Developing new skills in curriculum design and teaching would be a challenge, even for those instructors eager to try this out.

We were also aware that the implementation of PBL in the cultural context of Thailand would bring additional challenges. Prior research on the implementation of problem-based leadership development in Asia suggested a variety of problems related to instructor attitude and skill as well as student norms and behavior (Hallinger, Chantarapanya, Siriboonma, 1995; Walker, Bridges, & Chan, 1996).

Finally, the pace and scope of implementation would present additional challenges. We anticipated implementing several class sections of the new PBL curriculum in the first term, which was only a couple of months away. PBL would require a degree of interdependence in both curriculum design and instructional delivery among faculty members that was altogether new at the College.

Over the next year we designed and implemented five new PBL projects in addition to the existing project on organizational change. The projects ranged in length from 14 to 21 hours in total length (i.e., four to seven three-hour class sessions). During the first year of implementation, students completed five of the six projects in the two-term course sequence. After evaluating the results of the first year of implementation, we reduced the number of projects to four and standardized the length of each project to seven weeks.

Each project would be designed and delivered by a team of between two and five instructors. Each instructor team had an assigned team leader who was responsible for coordination of instructors, maintaining linkage with the Subject Leader of the *Consulting Practice*, as well as for organization of the project and delivery of instruction.

The reader should note that even with our foreknowledge of these issues at the outset, it was only *during* implementation that many of them were resolved. Moreover, the implementation effort eventually involved 20 different instructors during the first year alone, as some instructors dropped out along the way. This also meant that the common knowledge base concerning both PBL and the content of various projects among members of the design teams had to be periodically refreshed. These observations reinforce the true impact that the broad scope and rapid pace of implementation had on our effort.

### Implementation of the PBL Curriculum

Concurrent with initiation of the design teams during April and May of 2000, it was necessary to inform students of the new option being offered in the June term. A series of “public information” presentations were scheduled at which we outlined the differences and similarities between the PBL option and the traditional choices (see sample in Appendix A). Student concerns revolved around three main areas:

- Clarification of what the problems and disciplines that the projects would focus upon, what they would have to do, and how they would be assessed.
- The relative amount of work compared with IS, which was also a six-credit option.
- Whether or not they would be able to choose the members of their teams.

The outcome of this phase was that 108 students (36%) of the potentially eligible students signed up for the *Consulting Practice* option in the June term. We opened five sections to accommodate them (average class size of 22). We planned to implement two seven-week projects during the June term: *Making Change Happen!* and *Retail to E-tail*. In this section of the paper we will present the results of the implementation effort as well as a descriptive narrative of the chronology.

### Results

The data reported here are taken from student course evaluations conducted at the conclusion of all courses in the College. They represent quantitative data taken from a 17-question student course evaluation survey as well as qualitative feedback taken from the same survey and “Talkback” sheets completed at the end of each PBL project. The quantitative survey uses a five point Likert scale in which a higher score reflects better performance. This approach to assessing the implementation of PBL has been used previously with success. The analyses included here address the following questions:

1. Do students perceive the PBL projects as meeting a high standard of instruction?
2. Do students perceive differences in the approach to instruction in the PBL projects compared with traditional courses in the college?

The analyses compare student perceptions of the PBL projects with corresponding results taken from our *Core Courses* over the same four-term period of implementation. The rationale behind comparing the PBL instructor and course ratings to those of the Core Classes lies in our belief that the PBL classes should be emphasizing particular teaching and learning skills more than the Core Classes. The Core Courses are taken by all students in all specialization programs in our Master

Degree. They include Principles of Management, Finance, MIS, Economics, and Marketing. All students who would be taking the PBL option would have also completed the Core Classes.

[Insert Figure One about here: Trend comparison of Overall PBL Mean v. Core Mean on instructor rating]

The first question we asked was whether students perceived the PBL course as meeting a high standard of instruction? To answer this question we refer to data displayed in Figure One. This figure compares the mean rating of the instructor in all sections of all PBL projects in each of the four terms with the mean of all sections of the more traditionally taught Core Classes. The typical number of sections being compared in a given term would be approximately 20 sections of Core Courses against 15 sections of PBL course projects.

As the graph indicates, students have perceived the PBL courses as being delivered at a high level of overall quality.

- With the exception of the fourth term of implementation, the mean PBL instructor rating across all sections was as high or higher than that of the Core Course sections in the same term.
- Also, it is notable that the overall mean for the PBL course sections has stayed within a relatively narrow range (3.90 to 4.10) across the four terms.
- By way of further comparison, although it is not included in the graph, we would note that the overall mean score of CP was higher than the overall mean score on the instructor quality item of all non-CP courses in the College during each of the terms.

Within the general trend of course evaluation data in the College, a rating of 4.00 reflects excellence in instruction. Ratings that fall below 3.50 reflect courses or instructors in need of improvement. Given these findings, we would conclude that overall, the PBL course has been implemented at a high standard of quality.

We would, however, be remiss if we did not also examine the variability of results across the various PBL projects. Figure One also displays the mean score on the overall quality of instruction item, term-by-term for each of the PBL projects. It should be noted that in a term any given project would typically have multiple course sections with a total of between two and four instructors (see further detail on the organization of the projects in the next section of the paper).

The data show greater variability in the results for the different PBL projects. This reflects differences in ability of the instructors to design and implement their projects. Despite the variability, we would note that the overall pattern is still generally positive (i.e., in the upper ranges of the rating scale). We will refer again to these data later in the paper when we describe the implementation process. The qualitative data reinforce this perception among the students that the PBL courses were generally implemented at a high level of quality.

The drop-off in results for the PBL course mean on these items in the fourth term is interesting and in a sense counter-intuitive. One would expect the results to improve as time passed and instructors became more confident in the course content and teaching method. However, that is not what happened. The unexpected result probably resulted from two factors. Turnover in instructors in the PBL teams in that term as well as improved results for the Core Courses, several of which also began to use PBL for the first time.

We were also interested to ascertain whether the intended goals of PBL as a student-centered learning method were being achieved. This question was again answered through a comparison of the PBL course results with those from the *Core Courses*. For this analysis, however, we looked at the results on specific scale items that addressed teaching and learning characteristics consistent with the goals of PBL. These items included the following:

- Rate the ability of the instructor to make the course content practical.
- Rate the instructor's ability to actively involve students in learning.
- Rate how well tests and assignments assessed your understanding of topics.
- Rate the instructor's effectiveness in encouraging students to learn from each other.

All of these items used the same response set: (1) Poor; (2) Not Very Good; (3) Average; (4) Very Good; (5) Excellent. If the instructors in the PBL course sections were using PBL as intended, we would expect better results on these items than in the more traditionally taught Core Course sections. The results on the other related items were generally in the same direction as the results presented in the first analysis. Students do perceive the PBL modules as using more active learning methods and as oriented towards the development of more practical application of knowledge.

### Conclusion

Faculty conflicts, curriculum development on-the-fly, achieving reliability across multiple assessments of student work, managing student grades, developing fair policies for problems unique to CI, constraints on faculty resources, and inability to predict student demand for the PBL track all made implementation a harrowing, but

energizing experience. In this final section of the paper we reflect on some of the implications of this effort to implement PBL at CMMU.

The findings from our evaluation study of PBL implementation are both encouraging and sobering. We have been encouraged by the warm reception that our students have given to this student-centered approach to learning. Moreover, although this effort was undertaken and implemented in very short span of time, the results were quite positive from the start, even as compared with the traditional Core Courses.

While the effort at CMMU needs to build greater instructor consistency, there is little question that the students have found the new PBL sequence challenging and rewarding. They perceive it to be meaningful and relevant to their current and future work roles. What is particularly surprising about this is that the workload for the PBL projects goes well beyond that of other courses and the standard is high. Indeed the percentage of students who do not achieve a passing grade in this course is higher than the rate at which students receive “C” in any other course in the college.

The more sobering implication of our effort lies in the resource-heavy nature of high quality PBL implementation. Factors that contributed to our successful effort included the following.

- Highly competent, strongly motivated faculty members were eager to take on this challenge and to put in extra effort to achieve success;
- Small class sizes enabled the necessary instructor-student interaction and feedback on student work products;
- Flexible classroom facilities supported the team-based learning that is central to PBL;

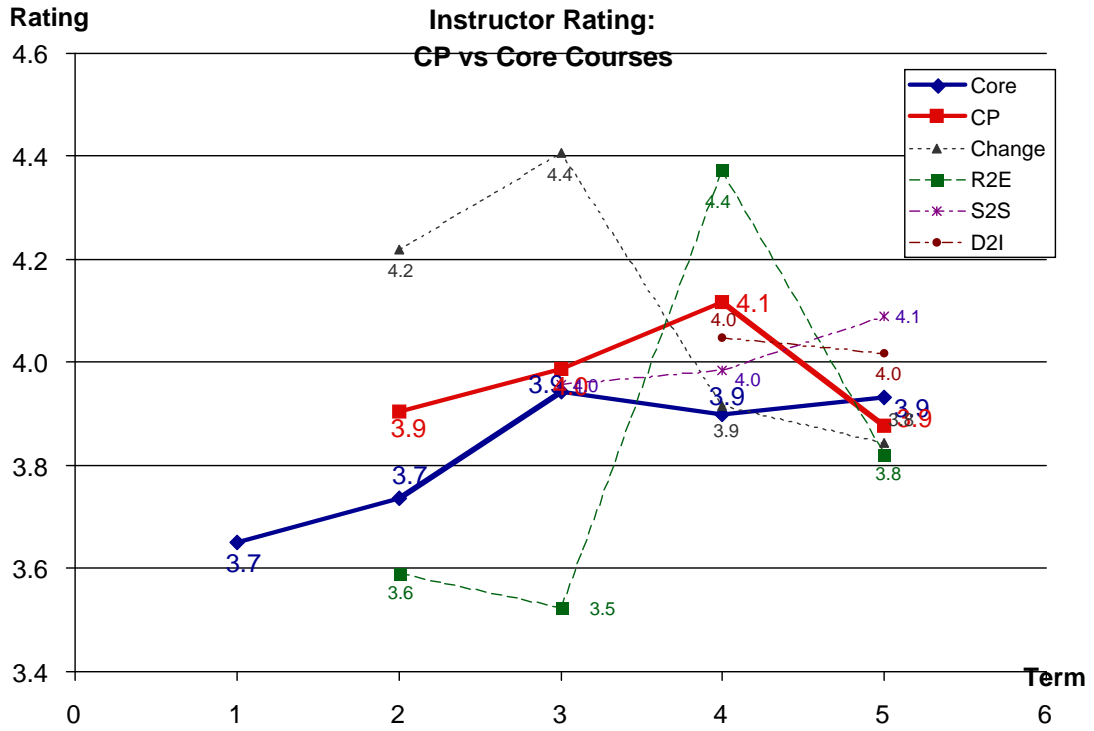


- Ample technology resources allowed the use of technology in each of the modules;
- We had sufficient financial resources to provide incentives for new project development;
- The college culture values and supports innovation;
- We were fortunate to have internal staff resources deeply steeped in PBL;
- Active support existed at the top of the organization – the board and senior management -- for the implementation of learning methods that would achieve our goals of developing knowledgeable students.

This set of contextual factors enabled us to implement PBL quickly and with reasonable quality. Even with these supportive conditions at CMMU, however, it has taken an *immense* effort to implement the PBL courses on a large scale.

We would close with the following observation. At CMMU, managers, faculty members and students would almost unanimously affirm the usefulness of the PBL track in the College. Even given the higher workload for all, it has brought new life to our curriculum. As suggested earlier, PBL is starting to migrate into other courses as instructors from Consulting Practice look for ways to bring more active learning to students in “regular” courses.

Figure One



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