



Published online: 3-27-2012

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Recommended Citation

Hallinger, P. , & Lu, J. (2012). Overcoming the Walmart Syndrome: Adapting Problem-based Management Education in East Asia. *Interdisciplinary Journal of Problem-Based Learning*, 6(1). Available at: <https://doi.org/10.7771/1541-5015.1311>

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Overcoming the *Walmart Syndrome*: Adapting Problem-based Management Education in East Asia

Philip Hallinger and Jiafang Lu

Abstract

This paper explores design issues to be considered in adapting the problem-based learning (PBL) for use in the context of East Asian higher education and tests its instructional effectiveness in a Master of Management degree program at a graduate school of business (GSB) in Thailand. The research analyzes course evaluation data obtained from 20,988 student reports over a seven-year period to assess the impact of a locally developed PBL curriculum on student perceptions of course effectiveness and engagement in learning. Results of growth modeling found that courses offered in the PBL curricular track achieved ratings that were significantly higher than ratings achieved in non-PBL Core Courses. We conclude that PBL was employed successfully in an East Asian context noted for its reliance on traditional educational approaches, but we note the importance of adaptations both for curriculum design and instructional delivery.

Keywords: problem-based learning, learner-centered, Asia, higher education, management education, Thailand

Introduction

In early 2001, a faculty seminar was underway in a Graduate School of Business (GSB) in Bangkok, Thailand. Discussion had centered on how instructors could more productively engage students in its master of management degree classes. Although the GSB had positioned itself around a vision of small classes and interactive instruction, a recent quality audit had highlighted a yawning gap between this vision and classroom reality. Faculty members, both from Thailand and abroad, expressed frustration at students' passivity and were at a loss over what to do about it.

One faculty member tentatively ventured that using business cases (Christensen, 1987, 1991; Garvin, 2003) had worked well in moving students beyond sitting, listening, and taking notes. In response, however, another instructor warned that cases by themselves might not be the solution and shared a short story.

I did my MBA at a university in Bangkok in a program offered with two of America's top-ranked business schools. During the two-year program we studied many business cases, including three that centered on Walmart, the American retail chain.

Several years after I graduated, my company sent me to the USA for business. After checking into the hotel, I took a walk with a couple of my Thai colleagues. To my surprise, the first store I saw when I went around the corner was Walmart. I was so excited! It was like going to Disney World for the first time after growing up seeing Mickey Mouse and Donald Duck on TV. You can't imagine how we long struggled over those Walmart cases in our MBA program. But when we walked into Walmart, I got the shock of my life! To this day I remembering crying out to my colleagues, 'You mean this is what Walmart is like! If I'd only known this when I was doing my MBA, I could have done so much better on those cases.'

This story encapsulates what the GSB faculty came to refer to as the *Walmart Syndrome*, or trying to learn from problems that are contextually removed from the learner's personal experience. Subsequently, the story served as a marker in terms of the faculty's efforts to develop a locally contextualized, problem-based management curriculum.

In this paper, we describe the faculty's approach to the cultural adaptation of problem-based learning for the East Asia context and present data designed to assess its success through empirical analysis. At the onset of this report, we introduce a general conceptual framework. Next we describe the cultural and organizational context in which PBL was implemented and discuss how the PBL curriculum was constructed and adapted. Then we

present a longitudinal, quasi-experimental evaluation of the instructional effectiveness of a PBL curriculum track against a group of non-PBL Core Courses over a seven-year period at the GSB in Thailand. In this design, instructional approach (PBL or non-PBL) is treated as the independent variable, and we examine its impact on the student perceptions of course effectiveness and engagement in learning as dependent variables.

Higher education institutions throughout the world are searching for teaching and learning methods that will both engage students more actively in their learning and contribute to a deeper understanding of course content (Argüelles & Gonczi, 2000). This search takes on special meaning in Asia where growth in tertiary education has outpaced other parts of the world (Altbach, 2004; Cheng, 2010), and many teachers have evinced scepticism concerning the efficacy of learner-centered, constructivist methods of teaching and learning (Biggs, 1994, 1996; Biggs & Tang, 2007; Biggs & Watkins, 1996; Kennedy, in press; Hallinger & Bridges, 2007; UGC, 2010 Walker, Bridges & Chan, 1996; Watkins, 2000, 2001). The current study addresses this issue by presenting empirical findings that describe student responses to a learner-centered curriculum in East Asia. We note that the study does not examine the impact of PBL on student learning outcomes, a critical issue in the literature (e.g., Gijbels, Dochy, Van den Bossche, & Segers, 2005). Yet, drawing upon data collected from a large sample of students over a substantial period of time, the findings do offer insight into student perceptions of active, productive engagement in their learning, another important variable of interest in this literature (e.g., Altbach, 2004; Astin, 1996, 1999; Edgerton, 2001; Smith, Sheppard, Johnson, & Johnson, 2005).

Conceptual Framework

Our perspective towards the adaptation of PBL for the East Asian context frames PBL as an approach that impacts student learning outcomes through a learning process characterized by high level of student engagement. Student learning outcomes include cognitive, attitudinal, and skills dimensions. For example, Engel (1991) proposed a variety of explicit goals for PBL, including reasoning critically and creatively (i.e., cognitive outcome), adapting to and participating in change (i.e., attitudinal outcome), and managing and participating productively in groups (i.e., skill outcome). Research has examined the impact of PBL on all three types of learning outcomes with the goal of identifying the contributions of different curricular (e.g., PBL curriculum integration vs. PBL curriculum track) and instructional (e.g., impact of different tutor styles on learner groups) features to engagement and learning (e.g., see Albanese & Mitchell, 1993; Colliver, 2000; Gijbels et al., 2005; Major & Palmer, 2001; Walton & Matthews, 1989).

The current study focuses explicitly on the component of student engagement in the learning process. Engagement indicates a positive absorbed state when an individual is involved in meaningful tasks (Seligman & Csikszentmihalyi, 2000). Research has linked

higher levels of engagement with student achievement and social development (Astin, 1996, 1999; Edgerton, 2001; Smith et al., 2005). Several design features of PBL provide points of leverage for positively impacting student engagement.

First, designing instruction around authentic task scenarios increases student motivation to think and explore (Bao, 2007; Bransford, 1993; Bransford, Brown, & Cocking, 2000; Bridges & Hallinger, 1995; Carroll, 2000; Klein, Noe, & Wang, 2006; Sockalingam, & Schmidt, 2011; Skinner & Belmont, 1993). Second, student engagement has been found to increase when effort is directed towards tasks that are aligned towards students' own personal and professional goals (Edgerton, 2001; Kember, 2000; Klein et al., 2006; Prawat, 1989; Smith et al., 2005; Watkins, 2000). Third, cognitive theory stresses that high quality learning experiences provide students with immediate opportunities to act towards the solution of meaningful problems (Bransford, 1993; Bransford et al., 2000; Evenson & Hmelo, 2000; Prawat, 1989). Moreover, the form of PBL discussed in this study further sought for students to implement, in varying degrees, their solutions through the use of development of real products (e.g., a marketing plan, a website, a simulation, or a role play).

As noted above, research on PBL has sought to describe and analyze the differential effects of PBL on learning outcomes. We conceptualize PBL as both an approach to curriculum design and a method of engaging students in learning. With respect to curriculum design, we pay particular attention to two features. First, we highlight the design of specific PBL units or projects. As we shall discuss subsequently, PBL units can be designed in different ways (e.g., student-centered vs. problem-stimulated units). Second, we suggest that the impact of any particular PBL unit is also linked to the manner in which PBL is integrated and implemented within the overall curriculum. For example, scholars have noted that PBL can be used by a single instructor in a course, as part of a specific curriculum track, or synthesized into courses throughout a management curriculum (see Bridges & Hallinger, 1995; Sherwood, 2004; Stinson, & Milter, 1996).

PBL is an approach to learning and teaching as well as to curriculum design (Barrows & Tamblyn, 1980; Bridges & Hallinger, 1995). Thus the selected approach to classroom implementation of a PBL unit will also impact its effectiveness. For example, studies have compared different approaches to the use of tutors in PBL programs in medical education (see Colliver, 2000; Major & Palmer, 2001). In contrast, in many management education programs, instructors employ self-managing student teams rather than tutors (Hallinger & Bridges, 2007).

Finally, we propose that other moderating factors such as societal culture, teachers' pedagogical proficiency, classroom, and learner characteristics can impact the learning process described above. Among these factors, a society's culture of teaching and learning is most relevant to the setting of this study. The fit between the instructional approach and cultural orientation of learners in Asia remains a concern for researchers as well as for

instructors (Coleman, 1996; Hu, 2002). It has often been assumed that Asian students prefer rote learning and teacher-directed instruction. Scholarly discourse suggests that active learning approaches conflict both with the Asian student's beliefs about the purposes of learning and normative hierarchical relationships that exist between teachers and students (e.g., Hu, 2002). Despite these assertions, two different cross-culture empirical studies found little evidence indicating that the structure of learning process in Asian students is different from Western learners (Kember, 2000; Watkins, Reghi, & Astilla, 1991). Moreover, as suggested at the outset of this paper, in the practical higher education teaching context in East Asia, instructors often find themselves at a loss as to how to engage students actively in their learning.

Furthermore, both interview and survey studies conducted in Asia revealed that these cultural characteristics do not necessarily hinder student from engagement in active learning approaches. For example, better students do not see memorizing and understanding as separate, rather, they believe repetitive learning enhances retention and understanding (Biggs, 1996; Biggs & Tang, 2007; Watkins, 2000). It is also noted that, in contrast with Western students whose intrinsic motivation is treated as the precursor of deep learning, Chinese students are more likely to be activated by a mixed motivational stream. This is comprised of "personal ambition, family face, peer support, material reward, and, yes, possibly even interest" (Biggs & Watkins, 1996, p. 273). In collectivism culture, these are high levels of achieving motive, rather than extrinsic forms of motivation that would in turn depress intrinsic learning motivation (Kember, 2000). Additional studies have documented that Asian learners are more likely to attribute success to effort and persistence (Biggs, 1996; Hess & Zauma, 1991; McClure et al., 2011). We suggest that some of these Asian cultural characteristic may act as positive advantages rather than constraints in the implementation of PBL.

This conceptual framework was employed as a general guide for thinking about the relevant points of leverage in the adaptation of PBL for the Asian context. We should, however, note that the study did not explicitly test this framework. As we shall elaborate in the methods section of this report, the research design only examined the impact of a culturally adapted PBL curriculum on student perceptions of course effectiveness and student engagement.

PBL Curriculum Design in a East Asian Management Education Context

In this section, we discuss how PBL was incorporated into the management curriculum at a GSB in Thailand. We begin by briefly presenting the implementation context for PBL at the GSB in Thailand. Then we discuss the design of specific PBL units of study or projects and their incorporation into a PBL track in the master of management program (Bridges

& Hallinger 1995). Then we examine changes made in the overall curriculum that were designed to support student learning in the PBL track. We pay specific attention to how different features of the curriculum and its delivery were adapted for an East Asian context.

PBL Implementation at the GSB

The GSB was started in 1998 as the business school in a large comprehensive, science-oriented, government university located in Thailand. The GSB initially offered the master of management degree in a variety of specializations, but later expanded to include bachelor and Ph.D. degree programs as well. The GSB's vision was to offer a student-centered, practice-oriented learning experience in small classes. The GSB's stated mission was to 'develop knowledgeable students who are able to apply their learning effectively in work and their lives, today and in the future.' Nonetheless, a quality audit conducted in 2000 found that the GSB was not achieving its vision. In response, in early 2001, the GSB's management team explored a variety of instructional and curricular strategies that were explicitly aligned to the goal of learner-centered management education. After considerable debate, the management team decided on a multi-faceted strategy intended to make the GSB's vision reality. One facet of the strategy involved the design and implementation of a PBL track as an additional "capstone option" in the final two terms of its five trimester-long program (i.e., as an alternative to Thesis and IS).

Among the choices that a faculty must make in the design and use of problem-based learning is which form of PBL to employ. Two major variants of problem-based learning were first described 25 years ago by Barrows (1986): student-centered PBL and problem-stimulated PBL. Hallinger and Bridges (2007) noted the following with respect to their distinguishing characteristics:

The major differences between the two types of PBL projects concern who identifies the learning objectives, the resources, and the guiding questions. In problem stimulated projects, the instructor assumes primary responsibility for this task. In a student-centered project, the student assumes primary responsibility for these three components. (p. 46)

Student-centered PBL units provide students with relatively less structure, but incorporate a tutor to facilitate the learning of student teams (Barrows, 1986). A student-centered PBL unit typically includes a problem description and a set of product or solution specifications. Under the guidance of a tutor, students then proceed to identify their own learning objectives and search for relevant knowledge that can be applied to the problem.

In contrast, problem-stimulated PBL projects not only provide students with a focal problem and product specifications, but also a set of initial learning objectives, guiding questions, learning resources, and assessment tasks. While still engaging students in an

authentic problem-based learning experience and requiring students to develop their own personal learning issues, these additional components provide a somewhat more structured learning context (Barrows, 1986). At the same time, however, the version of PBL adopted in the GSB placed students in self-managing teams without the active facilitation and support of a tutor (e.g., Bridges & Hallinger, 1995). The additional structure provided by problem-stimulated PBL reduced some of the uncertainties for students and offered a series of action-directed opportunities to develop important team management skills (Bridges & Hallinger, 1995; Hallinger & Bridges, 2007). These included team leadership, group problem-solving and decision-making and conflict management.

In the implementation context at the GSB, three factors informed the decision to employ the problem-stimulated version of PBL. First, the predominately Asian students attending the master of management program had little or no prior exposure to non-traditional forms of teaching and learning. Second, we were aware both from the literature as well as from interactions with our students that they would tend to evince a strong need for certainty in the learning process (e.g., Bao, 2007; Biggs, 1993, 1996; Hu, 2002; Watkins et al., 1991, 2000). Third, as noted above, we believed that this version of PBL would place them in more authentic contexts in which to practice team leadership and management skills. Therefore the design team at the GSB in Thailand felt that the problem-stimulated version of PBL would be a less radical departure from the teaching to which students were accustomed.

We should also note that the same principle held true with respect to thinking about introducing this change in teaching approach for the GSB's instructors: Few of the faculty members, Asian or Western, at the GSB had received formal training in teaching, not to mention problem-based learning (Clawson, & Haskins, 2006; Hallinger & Bridges, 2007; Walker, Bridges & Chan, 1996). Moreover, there is an abundant empirical literature that supports the assumption that change in teaching behaviors will tend to be slow and uncertain not only in Asia (e.g., Hallinger & Lu, 2010), but also in other parts of the world (Evans, 1996; Fullan, 2007). Thus, we did not assume that they would make the transition to this form of PBL any more easily than the students.

Cultural Adaptations in the Design of Problem-Based Learning Units

Bridges and Hallinger (1995) identified six components of a problem-stimulated PBL unit, or what they term a project. These include the: 1) problem, 2) introduction, 3) learning objectives, 3) guiding questions, 4) product specifications, 5) learning resources, 6) assessment. In this report, we focus attention on clarifying how the problem and learning resources were adapted for the perceived needs of Asian learners. While introduction, learning objectives, product specifications, and assessments were designed to align with the problem and learning objectives, they were not conceived as leverage points in the

cultural adaptation of the PBL units, so they are not discussed in this article. Nonetheless, we consider these as essential components that impacted the success of PBL (see Hallinger & Bridges, 2007).

The problem. The central component of problem-based learning lies in a specific though often ambiguous problem (Bridges & Hallinger, 1995). The problem statement or scenario is akin to what professors who teach with the case method might use. The scenario describes the context and nature of the problematic situation. The problem is based upon real problems identified in professional practice and is related to the expected role and work context of the students. A problem-based management curriculum focused on messy or swampy problems that have a significant impact in the work of organizational leaders.

If we reconsider the impact of the *Walmart Syndrome*, however, it becomes clear that we cannot assume that the problems faced by managers in different cultures are necessarily the same. Even when their general needs in terms of the knowledge or skill domains (e.g., team leadership, managing change) are similar, the socio-cultural contexts in which they apply those skills are likely to be significantly different (Walker et al., 1996). This is a fundamental issue that we suggest is likely to impact student motivation, engagement, understanding, and transfer of learning (Bridges & Hallinger, 1995; Hallinger & Bridges, 2007).

With respect to motivation, in PBL the problem is the key stimulus for student learning, not the disciplinary content. Thus, to the maximum extent possible, the problematic situation presented to managers in the PBL project should approximate the situation they face in their own organizations. Over time the GSB faculty designed numerous PBL projects around a wide range of scenarios drawn from local, regional and locally housed multi-national organizations in which the learners were working or would likely work in the future (see Hallinger & Bridges, 2007).

For example, the module on organizational change employed a computer simulation that had originally been developed in the USA. A significant research and development effort went into the redesign of the simulation so as to situate the problem authentically in the Thai organizational context. Not only were text descriptions related to the problem contexts changed, but decision rules guiding the interactions of the company's staff during the change process were also adapted to reflect the modal cultural responses of Thai people and organizations (see Hallinger & Bridges, 2007; Hallinger & Kantamara, 2001).

Most of the other PBL units were built from the ground up around problems encountered in local organizations. Several of our instructors drew on problems they encountered in corporate consultancies for inspiration. Over time, the faculty members involved in the PBL track became quite adept at sourcing new organizational contexts to use for existing PBL projects. For example, one of the first projects developed by the faculty centered on the challenges facing Thai organizations as they sought to adapt to changes brought

about by the advent of the internet. The first version of the PBL unit focused on a jewelry company. However, over time the instructional team built different versions of the same PBL unit around manifestations of a similar problem in a shoe company, a private school, and a health spa. Faculty teaching a PBL unit focusing on human resource challenges in a rapidly changing business environment used a similar approach to project design. They presented the problem in the context of local organizations including an urban hospital, a bank and a ceramics factory. It should be noted that these units typically incorporated video clips of the company as well as video interviews with staff as a means of conveying the problem and achieving authenticity. Qualitative student feedback collected at the end of every PBL course consistently suggested that students found the problems authentic and a source of motivation to engage in the project process.

The view of this connection is critical for motivating students to engage seriously in the learning (Bao, 2007; Carroll, 2000; Klein et al., 2006; Sockalingam & Schmidt, 2011; Skinner & Belmont, 1993). One implication is that the problem must be culturally appropriate in both form of expression of the problem and content. In our experience working with management students, we have found that they are highly sensitive to details that reflect different organizational features (e.g., hierarchical responsibilities, institutional organization) and norms (e.g., role behaviors of managers). Since student engagement is stimulated, in part, by the authenticity and richness of details concerning the problem (Bransford, 1993), we wish to suggest that the impact of the project problem is enhanced when the situation reflects the local culture.

We found that PBL projects in which the problem was conveyed through a video case offered important advantages. Consistent with cognitive theory, conveying the problem further enhanced the sense of reality of the problem and challenged students to develop pattern recognition through attention to tacit details embedded in the scenarios (Bransford, 1993; Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990; Dickinson & Summers, 2011; Hakkarainen, 2011). This was ideal given our goal of providing learners with contextualized business problems and challenged students to refine their skills in problem-finding. Over time, it became standard practice for design teams to develop video case scenarios as a means of conveying the problematic situation.

Finally, the problematic situation represents the context in which students will apply their new knowledge. Appropriate learning requires that the context for implementation be faithful in critical respects to the implementation context faced among the learners. Thus, student "products" were also evaluated not only for consistency with general theory but also with respect to the practical exigencies of implementation in this local context.

We close this consideration of cultural adaptation by further noting that this assertion for contextualization must be leavened with the recognition that "international problem foci" from outside the local context retain a place in a globally relevant management curriculum. We simply contend that there should be a balance in the design of the curriculum.

Learning resources. Each problem-based learning project also includes a set of resource materials that shed light on the general task, the specific problem, and the solution product(s) to be delivered. Resources typically include readings from the disciplinary domains related to the problem and learning objectives addressed in the project. Wherever possible, the resources go beyond readings and may include videotapes and human resources, both practitioners and professors, who are knowledgeable about the focal problem.

Probably the greatest single challenge to the use of problem-based learning outside of Western contexts concerns the availability of a rich set of resources that can be applied towards the problematic situation. In the more or less *pure* forms of problem-based learning described in the literature (Barrows & Tamblyn, 1980; Bridges & Hallinger, 1995), it is intended that virtually all learning will occur as a consequence of students' (individual and group) investigation of relevant resources (human, text, and video).

It is, unfortunately, the case that the bulk of such resources are printed in the English language. Yet, in many developing countries even graduate students' language skills may be inadequate to demands of using English for technical readings. Moreover, the accessibility of students to relevant resources in their native language is limited. Of course, the same constraints inhibit the use of English language books and articles under normal instructional circumstances. Under a lecture-discussion format, the instructor can rely more heavily on filling in the critical information through the lectures. However, PBL places much higher demands on students' ability to process instructional resources—books and videotapes—independently as the mainstay of their learning.

We have experimented with a variety of methods for coping with this important constraint. First, within the context of a given PBL project, we supplemented the PBL project materials with short lectures (e.g., 1 hour of direct input within 18 hours of face-to-face meetings) and handouts. In using this strategy we tried to be consistent with the tenets of PBL, mini-lectures were employed *after* students have been introduced to and grappled with the problems presented in the project. Second, we only provide students with a limited set of key readings in English. They were expected to source a wide variety of additional knowledge resources.

Third, we gave considerable emphasis to the use of relevant *human resources* as learning resources in problem-based learning. Thus, a practitioner or scholar with expert knowledge about the problematic situation might be identified. S/he might serve as a "consultant" to the teams during one class session of the PBL project. Consultants were briefed in advance as to their role and cautioned about giving answers. Instead their brief was to respond to student questions and broaden their understanding of the problem and practical exigencies of the local context.

Design of the PBL Curriculum Track

Over the seven year period of implementation described in this paper, the GSB faculty designed and implemented nine PBL projects that came to comprise a *PBL Track* in the Master degree curriculum. Over time, seven of these PBL modules or projects were taught on a regular basis.¹ These PBL projects addressed high impact problems faced in the East Asian management environment. The selection of problems for inclusion in the PBL track sought to represent the range of core areas within the Master of Management curriculum including organizational behavior, human resource management, information management, and decision-making, marketing and business strategy.

In terms of curriculum delivery, students selected four of the seven modules to fulfill the capstone requirement in the PBL Track. Each module held class meetings three hours per week for six weeks (i.e., half of the trimester term). Given the large number of students that subsequently chose the PBL Track as their capstone option, typically over 300 per year, each PBL module was taught by several instructors who formed a course team. Although each instructor typically taught his/her own class section, it was an explicit requirement that all instructors of a module use the same learning objectives, content, learning sequence, and assessments. This was non-negotiable and dramatically raised the level of interdependence among instructors.

Evolutionary Design of a Spiral Curriculum

Thus far, we have focused on the design of specific PBL projects. Next we wish to expand this perspective on curriculum design by discussing how the projects that comprised the PBL track were incorporated into the broader management curriculum at the GSB. As noted earlier, PBL was implemented as a self-contained curriculum track that students entered in their final two terms of the Master of Management program. Whereas other courses in the GSB's management curriculum were taught through a diversity of teaching methods, the PBL track relied exclusively on problem-based learning.

With this in mind, the faculty undertook a conscious effort to link the PBL track to the main curriculum. Consistent with the notion of a spiral curriculum, this approach to curriculum design sought to enhance the ability of learners to benefit from PBL by scaffolding content objectives as well as skills upon a base of earlier learning in the program. Over time, the skills needed to succeed in the PBL track were identified and incorporated into a curriculum map. These included learning process skills such as team problem-solving decision-making as well as management related skills needed to successfully develop and perform solutions to the projects such as presentation, business writing, information management and analysis skills. In this way, the main curriculum of the GSB provided a scaffold of skills and attitudes necessary for success, both in the PBL track and the broader management program. Conversely, the PBL track, although designed to teach

new knowledge also evolved into an important curricular arena in which students would demonstrate the maturation of their analytical and management skills as well as their growth as independent learners. We suggest that this approach to curriculum integration employed in the GSB further facilitated the capacity of students to engage courses in the PBL track actively and productively (Bridges & Hallinger, 1995; Felder, 2004; Hallinger & Bridges, 2007; Sherwood, 2004; Stinson & Milter, 1996).

Method

Research Design

This study sought to evaluate the impact of courses that comprised the PBL Track in the capstone portion of the master of management program. In order to investigate this phenomenon, the study employed a quasi-experimental research design with non-equivalent groups based on time-series observation (Campbell & Stanley, 1966). This made it possible to employ growth modeling techniques capable of exploiting the longitudinal feature in data (Campbell & Stanley, 1966; Davies, 1994; Huber & van de Ven, 1995; Singer & Willett, 2003). We sought to address the following two specific research questions:

1. Do graduate management students perceive the adapted PBL curriculum as more effective than non-PBL curriculum over time?
2. Do graduate management students perceive the adapted PBL curriculum as more engaging than non-PBL curriculum over time?

We note that this quasi-experimental design is subject to several potential threats to validity. One derives from the influence of unmeasured variables and unique features of the setting in which the PBL courses were taught. For example, characteristics of the students (e.g., predominantly part-time East Asian graduate management students), instructors (e.g., nationality, experience, part-time/full-time), and cultural context (i.e., Thailand) could limit the generalizability of the results, even if the study finds significant differences between the experimental and control groups. Another limitation lies in the specificity of measurement comparisons. As noted earlier, this study does not assess the 'unique contribution' of components of the model earlier described. Nor does it assess the relative impact of specific cultural adaptations (e.g., comparing engagement of students working on a global version and culturally adapted version of a PBL problem). Instead, it assesses an "overall PBL effect."

Subject Groups

We described the nature of the PBL intervention and the specific courses that comprised the PBL track in the previous section of this report. Here we wish to clarify the nature of the courses that comprised the comparison group of courses in this study. The courses selected for comparison for this report included five non-PBL core courses studied in the master of management program. The rationale for selecting core courses for comparison with courses in the PBL track rested on the clear contrast of instructional approaches as well as comparability of several factors. First, the core courses were roughly similar in number, thereby offering comparability in the number of class sections, students and instructors (e.g., in contrast to comparing the PBL classes with 'all other courses'). Second, like courses in the PBL track, the core courses were taught by teams of instructors who were required to follow an agreed upon curriculum and to use common assessments. Finally, focusing on a relatively small set of courses for comparison allowed us to describe the instructional methods used in those courses so that we can understand the nature of the comparison in clearer perspective.

Five non-PBL core courses were employed for the purpose of comparing the perceived impact of the PBL courses on student engagement. It should be highlighted that concurrent with the implementation of the PBL track, the GSB began to place a more general emphasis on fostering active learning throughout the college, including among the core courses. Thus, as indicated below, even the core courses were taught through a variety of methods. It should be noted that for both groups of courses, the maximum class size of the GBS is set at 30 students.

Sample

The unit of analysis in this study is comprised of the course and its various class sections (i.e., a course could be offered in multiple sections within a term). We were interested in student responses on relevant course evaluation items for each class section of courses taught between January 2001 and September 2007. Since the GSB operates in a trimester system, the period of analysis included 21 trimesters.

Table 1 includes the sample characteristics broken down for two groups of courses: PBL courses and core courses. During the period of the study, PBL courses were taught 395 times by 44 different instructors. Ratings from the 9,213 students in these class sections were compared with ratings obtained from 11,775 students in 473 class sections of core courses. The average class size is 25 students. We note that the student pool in the two groups of courses would not have differed in terms of personal characteristics since core course are compulsory for all students, and by the second year of implementation over 90% of students in the college take the PBL track. The data in Table 1 indicate that

the student response rate was greater than 80% which meet the requirements for this type of research (Lyon & Hendry, 2002).

Table 1. Summary of Course, Instructor, Student Information: 2000-2007

Students, Instructors and Classes	PBL Courses	Core Courses	Total
Number of Course Sections	395	473	868
Number of Instructors	44	69	113
Average Students per Section	23.32	26.76	25.14
Total Number of Students	9,213	11,775	20,988
Total Returned Questionnaires	8,346	9,588	17,934
Response Rate	91%	81%	85%

Note:

a. 2 instructors taught both PBL classes and Core classes, and they were treated as separate individual instructors in the analyses.

Instrument

This research employed GSB's Course Evaluation Questionnaire administered to students at the conclusion of each term. Course evaluation questionnaires are subject to a variety of potential problems when employed as tools for academic research (Aleamoni, 1999; Scriven, 1995). Points of criticism include mixed purpose questions, item wording that biases student responses, overly long forms, ambiguous and compound questions, comparative questions, inconsistent or biased procedures for administration and processing of forms, and methods of analysis that provide a distorted picture of results (Lyon & Hendry, 2002; Scriven, 1995). Nonetheless, a substantial body of research clearly supports the potential of purposively designed course evaluation questionnaires for providing reliable and valid data (Aleamoni, 1999).

Both the questionnaire design and procedures for administering and using the GSB evaluation form sought to address features that typically threaten the validity of such scales (Scriven, 1995). The scale was designed after a thorough review of scales used internationally by other universities and in consultation with psychometricians. The questionnaire was administered systematically by GSB academic support staff who received several rounds of training for the task. During administration of the questionnaire, the instructor was required to physically leave the room and completed forms were collected by members of the academic staff, not the instructor. Completed forms were sent to an external company for data entry prior to analysis by college staff. These procedures were designed with the goal of increasing the validity of student ratings (Aleamoni, 1999; Scriven, 1995).

For the purposes of this report, impact was measured in terms of two dependent variables. The first consisted of a measure of course effectiveness using a single-item that

directly asked students to rate the overall effectiveness of the course. The second, student engagement, represents the intensity and nature of students' involvement in the course (Edgerton, 2001; Skinner & Belmont, 1993; Smith et al., 2005). This variable was measured by two items that asked students to rate the extent to which the course allowed them to become actively involved in their learning and encouraged students to learn from each other. The alpha coefficient for this scale was .95.

As an initial attempt to check the validity of data obtained from the scale, student feedback was compared to data obtained from alternate sources. For example, data collected from observations of eight selected instructors was compared with data on several items. The instructor sample consisted of four highly-rated and four low-rated instructors where the ratings were consistent across at least three terms. Three 20-minute observations were made in each of these instructor's classes. The observations focused on two items: "encourages students to learn from each other", and "actively involves students in learning". The results were largely quite consistent with end-of-course student evaluation.

Data Analysis

Data analysis focused first on understanding whether students reported that the PBL courses consistently met the performance criterion at a high standard. This was accomplished first using descriptive statistics on all courses, PBL courses, and core courses. Next, we employed an independent samples *t*-test to determine whether students perceived PBL courses as more effective than core courses which used a wider variety of other instructional approaches. Subsequent analyses exploited the longitudinal feature of the data. We began this phase of the analysis by graphing the trends in course results for the PBL and core courses term-by-term over the seven year period. Then we constructed Mixed-effects models (Heck, Thomas, & Tabata, 2010) to assess differences in student perceptions of the PBL courses with core courses on student engagement over time. This test takes into account variability in individual instructors as well as variance in the change trend year-by-year over time.

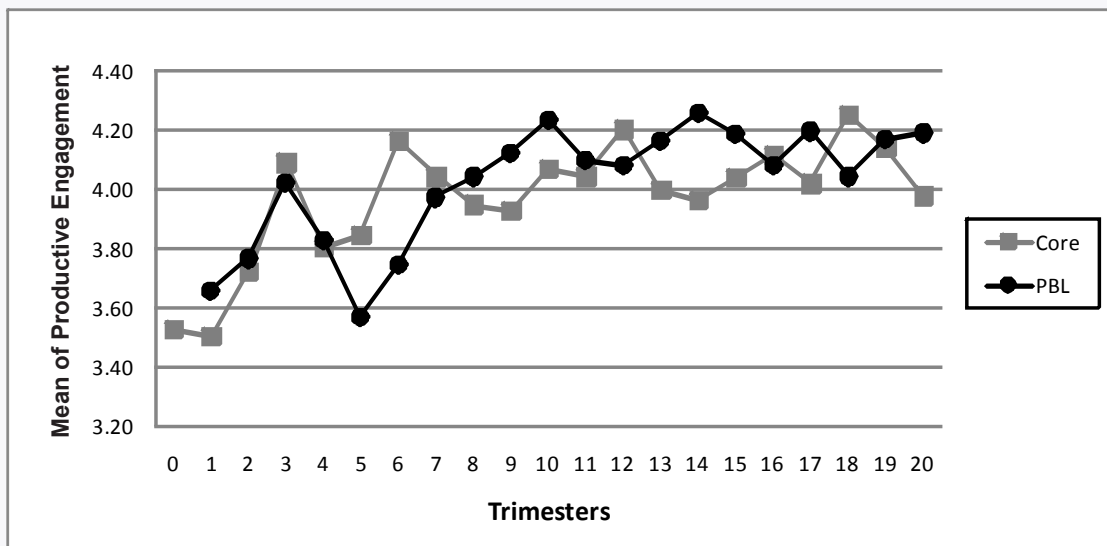
Results

We begin by presenting statistics that describe student perceptions of all courses in the GSB prior to the implementation of the PBL track and redesigned core courses. In the January 2001 term, the mean rating for all courses in the GSB was 3.52 on Student Engagement and 3.58 on course effectiveness. We used these as the baseline levels for the study. We note that the mean level of student engagement and course effectiveness for all courses in the GSB improved over time, stabilizing at about 4.00 after several years. The improvement in mean scores from January 2001 to September 2007 was both substantial for this measurement scale and statistically significant as confirmed by independent samples *t*-

tests for student engagement (Mean difference=.47, $t = 6.01$, $p < .001$) and overall course effectiveness (mean difference=.57, $t = 6.91$, $p < .001$). Considering the full scale of five points, the descriptive mean values and the improvement results suggest that in subsequent analyses the PBL courses are being assessed against a high standard of teaching and learning quality as perceived by the students.

Next we analyzed change in ratings of core and PBL courses on the two dependent variables through the use of descriptive statistics (see Table 2). Figure 1 presents a graphical display showing mean ratings of student engagement in PBL courses and core courses term-by-term over the seven-year period. This descriptive analysis sought to reveal change in student perceptions of the dependent measures over time. With minor fluctuations,² the graph indicates a consistent trend of positive growth in ratings of student engagement in both PBL and core courses during the period of the study. A similar positive trend is apparent for student perceptions of course effectiveness in PBL and core courses as well (see Table 2).

Figure 1. Change in Student Engagement in PBL and Core Courses, 2001-2007



We next examined the statistical significance of this growth trend using a more powerful inferential test. We established mixed-effects models by fitting higher order polynomials in the same fashion to each assessment dimension over time. Three terms were included in the models, presenting linear, quadratic (U-shaped), and cubic (S-shaped) relationships between time and course evaluations respectively. Because instructors taught for varying lengths of time in the college, and taught varying number of courses within each trimester, the repeated measure was a product of time (21 trimesters coded from 0 to 20) and course sections taught by individual instructors within each trimester. Individual instructors were included in each mixed model as a random factor.

Table 2. Descriptive Statistics on PBL and Core Courses, 2000-2007

Dimensions	N of items	Alpha	2000 ^a										t	Sig.	
			M (SD)	2001 ^b M (SD)	2002 M (SD)	2003 M (SD)	2004 M (SD)	2005 M (SD)	2006 M (SD)	2007 ^c M (SD)	Total M (SD)				
1. Course Effectiveness	1	—													
PBL			3.72(.47)	3.65(.37)	3.96(.32)	4.08(.27)	4.09(.26)	4.02(.32)	4.08(.33)	3.94(.38)		.50	n.s.		
Core Courses			3.59(.46)	3.71(.37)	3.89(.37)	4.11(.38)	3.92(.41)	4.02(.31)	4.03(.35)	3.92(.41)					
2. Student Engagement	2	0.95													
PBL			3.78(.40)	3.70(.40)	4.03(.30)	4.14(.28)	4.21(.28)	4.12(.29)	4.18(.29)	4.02(.37)		3.48	**		
Core Courses			3.53(.44)	3.61(.35)	3.87(.37)	4.09(.36)	3.99(.39)	4.10(.37)	4.04(.36)	3.92(.41)					

Note: M = Mean; SD = Standard Deviation; n.s. = not significant; * = $p < .05$; ** = $p < .01$.

1. The statistics in the columns 2000 integrated the data of one trimester in 2000.
2. The statistics in the columns 2001 to 2006 integrated the data of three trimesters each year.
3. The statistics in the column of 2007 integrated data of two trimesters in 2007.

The results of the estimates of intercepts and three shape (i.e., growth) terms for each of the two dependent variables are presented in Table 3. The significant results with the linear term reinforce the finding of a consistent rate of growth in evaluations of course effectiveness and student engagement over the seven year period. Significant results with the quadratic and cubic terms would indicate that the rate of growth or decline changed over time. However, examination of the results reveals that the magnitude of estimates with the quadratic and cubic terms was trivial (less than .01). Therefore, these significant findings most likely resulted from the large sample size. This analytical result supports the statistical significance of the visual trend of positive and reasonably stable growth shown in Figure 1.

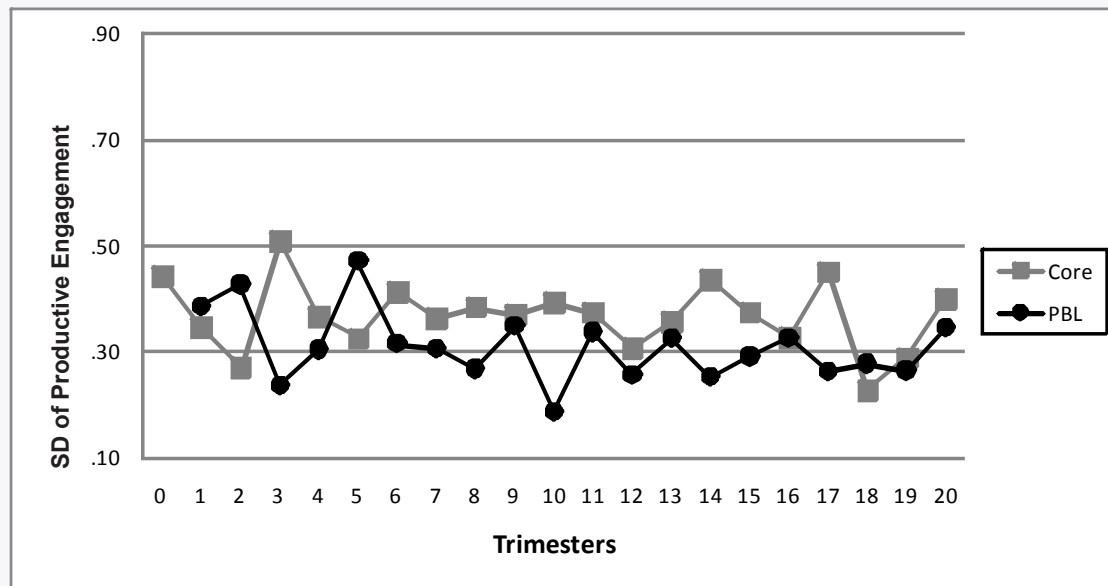
Table 3. Mixed-effects models Results for Testing the Shape of Trend, 2000-2007

	Course Effectiveness			Student Engagement		
	Estimate	SE	Sig.	Estimate	SE	Sig.
Intercept	3.52	.04	***	3.58	.04	***
Time (Linear)	.06	.01	***	.07	.01	***
Time (Quadratic)	-.00	.00	***	-.00	.00	*
Time (Cubic)	.00	.00	***	.00	.00	n.s.

Note: Estimate = Estimate of Fixed Effects; SE = Standard Errors; n.s. = not significant; * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

While analysis of average growth in the dependent measures is important, it offers an incomplete picture. Thus, we also wish to highlight the pattern of variance in ratings of the dependent variables (see Table 2 and Figure 2). For example, we noted that the PBL courses demonstrated lower variance (seven-year average $SD = .37$) in ratings of Student Engagement across class sections over time than core courses (seven-year average $SD = .40$). Moreover, the magnitude of variance among PBL courses tended to decrease over time. Taken together, these data suggest a trend of higher level of improvement, more consistent growth, and greater stability in the quality of delivery of the PBL courses over a substantial period of time.

Next we used Independent Samples *t*-tests on the seven years of data to compare the average rating of PBL courses with core courses on course effectiveness and student engagement. As reported in Table 2, these tests indicated that students reported significantly higher ratings for PBL courses on student engagement (mean difference = .10, $t = 3.48$, $p < .01$), but the results for course effectiveness (mean difference = .02, $t = .50$, $p = n.s.$) were not significantly different.

Figure 2. Variance in the ratings of Student Engagement in PBL and Core Courses

We then used mixed-effects models again to conduct a more robust test of differences between the two sets of courses on the dependent variables. This test estimated the association between instructional approaches and students' perceptions of engagement and course effectiveness while accounting for correlations between repeated observations on the same individual instructors and class size. The earlier growth analysis had revealed a linear shape for the change trend. Therefore, we included three fixed-effect factors in the model: instructional approach (core courses were coded as 0, and PBL courses as 1), the linear term of academic trimester, and class size (number of students in a class section). All models also included random intercepts for individual instructors. Therefore, in each model, we included factors that were of interest *a priori*, but with a particular focus on the association between instructional approach and the dependent variables.

The results of the mixed-effects models test are shown in Table 4. These included a positive main effect of time and a negative main effect of class size on student perceptions of student engagement. However, the magnitude of the effects was trivial (less than .01) in comparison with the effect of instructional approach. This finding using a more robust test reinforces the earlier result from the *t-test* for student engagement. Furthermore, the effects of the instructional approach on course effectiveness were also significant after controlling for the effects of growth in individual instructors and class size.

Thus, we conclude that learning in PBL courses monotonically increased student perceptions of student engagement (estimate of fixed effect = .15, $p < .01$) and course effectiveness (estimate of fixed effect = .13, $p < .05$). The statistical significance of the findings should be placed in perspective by recalling that the criterion standard against

which the PBL courses (i.e., the core courses) was being measured also demonstrated substantial increases over time and stabilized at a high absolute level.

Table 4. Mixed-effects models Results for PBL and Core Courses, 2000-2007

	Course Effectiveness			Student Engagement		
	Estimate	SE	Sig.	Estimate	SE	Sig.
Intercept	3.97	.05	***	3.86	.06	***
Time (Linear)	.01	.00	***	.02	.00	***
Class Size	-.01	.00	***	-.01	.00	***
Instructional Approach (0=Cores; 1=PBL)	.13	.06	*	.15	.06	*

Note: Estimate = Estimate of Fixed Effects; SE = Standard Errors; n.s. = not significant; * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Conclusion

This research responded to both theoretical and practical issues concerning the implementation of PBL in an Asian higher education context. The first theoretical issue arose from questions concerning the responsiveness of East Asian students to active learning approaches (Altbach, 2004; Biggs, 1994, 1996; Biggs & Tang, 2007; Tang, 1996; Tweed & Lehman, 2002; Vansteenkiste, Zhou, Lens & Soenens, 2005; Watkins, 2000, 2001). The second concerned the challenge of adapting problem-based learning for use outside of mainstream Western education contexts (e.g., Hallinger & Bridges, 2007; Walker et al., 1996). On the practical side, this study was conducted in the context of a graduate school of business in Thailand where faculty had expressed frustration at the lack of student engagement and responsiveness in class. Problem-based learning represented one teaching-learning approach that was implemented in response to this problem.

In this report, we discussed issues that impact on the design and adaptation of problem-based learning for students whose prior educational experience may not have prepared them for student-centered learning. This would aptly characterize the Asian students studying in the GSB. Employing a quasi-experimental research design, our quantitative analyses suggested that the PBL track in the management curriculum at the GSB was successfully implemented in a sustainable fashion over a substantial period of time. Statistical sets revealed the following main results:

1. Ratings of courses in the PBL Track demonstrated gradual, consistent, and statistically significant growth over time, stabilizing at a high absolute level on both Course Effectiveness and Student Engagement.
2. Ratings on Student Engagement for the PBL Courses were significantly higher than ratings obtained for the comparison group of Core Courses, despite the Core Courses also demonstrating substantial and significant growth to higher levels over the seven year period of the study,
3. Although both the PBL and Core Courses were taught by teams of instructors³ the PBL Courses evidenced lower variance in student ratings of engagement and course effectiveness thereby suggested greater consistency in the quality of delivery of learning experiences for students.

These results suggest that the PBL curriculum designed for use in this East Asian context offered an effective approach to engaging students actively in their learning. We wish to reemphasize that the standard used to assess the impact of the PBL Track was quite high. This was not a case of assessing PBL against a set of courses that relied solely on lecture and discussion. As suggested earlier, the Core Courses employed video-enriched lectures, text cases, project work, and in the marketing course, a computer simulation. This diversity of learning approaches was reflected in the strong growth in ratings of the Core Courses and the relatively small magnitude of differences in ratings of Course Effectiveness between the two groups of courses. This reinforces the conclusion that instructors can achieve positive results with East Asian students through the use of a variety of different active learning methods, including but not limited to problem-based learning.

Essential differences, however, lie in the lower level of local contextualization of content and the delivery of content through a disciplinary frame of reference rather than problems. As described earlier, the manner through which globally relevant business problems (e.g., concerning change, strategy, and marketing) were expressed in the context of local organizations enhanced the meaningfulness of the PBL projects to students. This feature helped to overcome the *Walmart Syndrome* discussed at the outset of the paper.

By way of example, we can contrast the computer simulation employed in the PBL unit on Organizational Change with simulation used in the marketing core course. As noted earlier, the actual responses of people in the localized PBL simulation made it 'feel' to students like it was a Thai company. Thai cultural norms of behavior such as *greng jai* (roughly translated as deference) led the simulated Thai staff to smile and respond politely, sometimes even enthusiastically, in conversations with the change team but take no steps to implement the change. In contrast, the marketing core course used a standard version

of the *Pharmasim*[™] (Interpretive Solutions, n.d.) simulation. Thus, although it also fostered an active learning environment, it was neither localized nor delivered in a PBL mode (i.e., present the problem first).

The second feature was the progressive introduction of PBL starting in the first term of the Master of Management program, integration into other courses during the program and finally in the PBL track. This enabled students to make a gradual transition from unskilled users to skillful users of PBL over a two year period of time. This developmental approach provided scaffolding for growth in skills and attitudes that fostered a positive response to the uncertainty of PBL and enhanced student development as collaborative independent learners. The decision to use the problem-stimulated variant of PBL, while not an adaptation in and of itself, seemed to provide similarly useful support towards these goals.

No single study can answer questions related to the effectiveness of a specific learning strategy. However, we hope that the descriptive and analytical portions of this paper contribute to an understanding of how contextual conditions can influence the implementation and outcomes of PBL. While this study focused explicitly on PBL, an unanticipated finding concerned the positive response of Asian students to a broader array of active learning methods employed in the Core Courses at the GSB. Thus, this research offers evidence for the broader contention that East Asian students can respond positively and productively to active learning methods (e.g., Biggs, 1996; Hallinger & Lu, 2010; Watkins, 2000, 2001). We suggest that this combination of results offers food for thought for those who continue to believe in the self-fulfilling prophecy that East Asian students desire to remain in a passive role, and need to be taught using rote learning methods. By properly adapting and structuring the curriculum, learning materials and mode of delivery, we believe that these methods can be employed just as effectively in East Asia as elsewhere in the world.

Acknowledgments

This work was supported by the Hong Kong Institute of Education (Ref. FES/TDG08-09/08).

Notes

1. The other two projects that were not retained in the PBL track involved project management and cross-cultural management. Although initially designed for the PBL track, these projects were incorporated for delivery in courses in Project Management and Organizational Behavior that were located in the main curriculum.

2. Fluctuations in ratings for the PBL courses can be attributed to issues that accompanied large-scale implementation of a coherent, team-taught curriculum in the PBL track. While the Core Courses

also employed instructional teams, the repertoire of teaching skills used by the instructors was a far less radical departure from 'the norm' to which they were accustomed (See Hallinger & Lu, 2010).

3. We wish to clarify that in both sets of courses, while instructors worked as teams in the organization and coordination of course content, materials and assessments, instructors taught their own individual course sections.

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