

The many roads to Problem-Based Learning: A Cross-Disciplinary Overview of PBL in Asian Institutions

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Abstract

Since the late 1970s, Asia has been adapting pedagogical breakthroughs to the unique context of its higher education institutions. In the late 1990s and 2000s, an explosion of interest in Problem-Based Learning swept the continent: hundreds of schools across dozens of fields put forward their versions of PBL. While the traditional ties with Western institutions continue to serve as an inspiration, many Asian institutions are now claiming a lead role in a new, very Asian way of carrying out the methods and philosophy of PBL – and in so doing, inspiring other Asian institutions to follow suit. This paper retraces the footsteps of PBL in Asia before offering a typology of the trends in PBL in Asia through selected examples, across cultures and disciplines.

Keywords: Problem-Based Learning, Asia, Cross-cultural comparisons, Cross-disciplinary comparison;

1. Introduction

Given the recent explosion of interest in PBL across the continent, an exercise in mapping out the use of Problem Based Learning (PBL) in Asia is both interesting and timely. Indeed, since the pioneering days of PBL in Asia in the early 1990s, hundreds of schools have moved to adopt some form of PBL, across dozens of fields of academic study, in so many different forms and variations that to depict each type of curriculum individually would be a momentous (and possibly futile) task. However, there are certain common trends in the implementation of PBL across the continent can be grouped into broader categories.

This paper proposes to identify the major trends in PBL in Asia through a typological approach, as this gives the best cross-disciplinary perspective, using the typology of Kwan & Tam (2009) as the basis for classification. There are now hundreds of higher education programs across Asia which claim to be using some form of PBL – however, given that little information is available on the vast majority of these, the examples in this paper have been chosen for their representativeness of the general trends, and for the quantity and quality of data available on these programs. The data used to support this paper was collected by the author through fieldwork at the institutions between February 2012 and November 2012, and originally used to write country by country overview reports, but had not been synthesized before. During these institutional visits, the author conducted a series of semi-structured interviews with faculty and students, observed the tutorials process, collected relevant materials such as unit manuals and problem scenarios, visited the premises including laboratories and tutorial rooms, and sometimes attended presentations and Q&A sessions with the faculty. Where ever possible, the data was cross-referenced with published materials such as books, monographs, journal articles and reports, as well as unpublished materials such as conference proceedings, reports and other documents sent to the author by the institutions or freely available on conference websites.

2. A brief history of PBL in Asia

It should come as no surprise that PBL in Asia began with medical education, since the first “PBL” program on record came about in the late 1960s at McMaster University’s new Medical School, in Hamilton, Ontario. The principles laid out by Dr. John Evans and his Education Committee (Spaulding, 1991) revolutionized medical education in a shake-up that called for the abandonment of traditional, compartmentalized, lecture-driven learning in favor of integrated, systems-based, small-group tutorials centered on biomedical problems as the trigger for learning (Barrows & Neufeld, 1974; Hamilton, 1976). This educational experiment sent ripples throughout the world of medical education. Although early developments happened mainly in Europe and North America, a new medical school at University Sains Malaysia seized the opportunity of a fresh start to test out the methods of PBL in its own curriculum in 1979 (Zabidi & Fuad, 2002). However, the real impetus for implementing PBL medical education in Asia came in the early 1990s, when several pioneering institutions attempted the method in their programs. The move was all the braver that all of these institutions had pre-existing curricula and would therefore have to convert rather than start from scratch. Seemingly independently, in the early 1990s, Tokyo Women’s Medical University (Yoshioka et al, 2005), The University of Hong Kong’s Faculty of Medicine (Kwan, 2012; Chan & Lam, 2006) and Gadjah Mada University’s Faculty of Medicine endeavored to put in place a PBL program, although all of these programs were so-called “hybrid” programs

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rather than comprehensive ones.

The term “*hybrid program*” can lead to some confusion – as Kwan and Tam (2009) rightly pointed out, by the strictest definition of “pure” PBL, everybody is running a hybrid curriculum, even McMaster! For the purposes of this paper, a “hybrid program” will refer to a program in which 50% or more of the student’s contact time is spent in lectures, and in which the integration of sub-disciplines is either minimal or non-existent. For the purposes of this paper, institutions in which one or two courses follow a full-PBL model but are not integrated with the rest of the curriculum and constitute a minority of the courses on the program are considered “hybrid”. This is what Kwan & Tam call Type 2 and 3 Hybrid Curricula (p.81). Institutions which run a program centered around PBL, with integrated thematic blocks and sufficient time granted for self-study will be categorized as “*comprehensive*” PBL programs, even if they still offer a certain number of lectures. This is what Kwan and Tam refer to as “Type 4 hybrid curricula” (p.81).

Throughout the 1990s and especially in the early 2000s, the number of medical schools utilizing PBL in Asia went up exponentially, such that, for instance, over 90% of Japanese medical schools were reported to be using some form of PBL by 2010 (Kozu, 2012), as were all 12 of the medical schools in Taiwan (Tsou, 2009) and between 50% and 70% of medical schools in Indonesia (N.M Rehatta, 2012, pers. Comm. 21st June). Governmental pressure for reform (Tsou, 2009; Teo, 2007; Satryo, 2002) is partly responsible for this push, but medical schools around the region have expressed concern about the need to modernize medical education, develop community-orientation and “soft skills” in their graduates.

Whilst medical education took the lead in implementing Problem Based Learning in Asia in the early years, programs in the field of applied sciences (Keng, 2011) and social sciences (Pearson, 2005) began to surface in the late 1990s. The main push for PBL in Asia took place in the 2000s, during which the number of programs and the fields of application exploded. PBL programs could be found in almost every area of health sciences; the first law programs using PBL were set up in Indonesia; diverse fields such as architecture and clinical psychology (Lee *et al*, 2009) began developing their own programs, often inspired by the faculty or school of medicine within the same institution. Networks developed which endeavored to structure the dialogue on PBL in the region, such as the Asia Pacific Association for PBL in the Health Sciences (APA-PHS) and the Asia Pacific Conference on PBL (APC-PBL) – which now jointly run a bi-annual conference on PBL in various countries around the region. As the method grew more popular, so more radical innovations began to spring out of the Asian educational scene. In 2002, the “One-Day, One-Problem” model was developed for a polytechnic institution in Singapore; in 2006, a Japanese Health Sciences institution built a PBL curriculum which integrated problems across all of its faculties. Finally, around the turn of the millennium, the Project-organized approach to PBL began making its breakthrough in applied sciences (Chin *et al*, 2012) and information systems engineering (Tozawa, 2009). The push for PBL in Asia also had its casualties, with some programs falling by the wayside, particularly in the Philippines (Tan, 2012, Pers. Comm. 27th March) and Singapore (Samarasekera, 2012, Pers. Comm. 10th April).

The following overview shows the great diversity in country of implementation, field of application, period of implementation and the type of curriculum (Table 1).

Table 1. Sample of PBL curricula in Asia

Institution	Country	Field of Application	Year of Implementation	Type of Curriculum
University Sains Malaysia	Malaysia	Medicine	1979	Comprehensive
Tokyo Women’s Medical University*	Japan	Medicine	1990	Hybrid
Gadjah Mada University*	Indonesia	Medicine	1992	Comprehensive (since 2002)
Ateneo de Zamboanga	The Philippines	Medicine	1994	Comprehensive
The University of Hong Kong*	Hong Kong	Medicine	1997	Hybrid
Temasek Polytechnic*	Singapore	Applied Sciences	1998	Hybrid
The University of Hong Kong*	Hong Kong	Social Work	1999	Hybrid (since 2000)
Airlangga University*	Indonesia	Medicine	1999	Hybrid
National University of Singapore*	Singapore	Medicine	1999-2010	Hybrid
Fu Jen Catholic University*	Taiwan	Medicine	2000	Comprehensive (yrs 3-4)
University Santo Tomas*	The Philippines	Medicine	2001-2006	Hybrid
Republic Polytechnic*	Singapore	Applied Sciences	2002	One-Day, One-Problem
Fu Jen Catholic University*	Taiwan	Clinical Psychology	2003	Hybrid
Universiti Teknologi Malaysia	Malaysia	Engineering	2003	Hybrid
Showa University*	Japan	Health Sciences	2004	Interprofessional
Gadjah Mada University*	Indonesia	Law	2006	Hybrid
Udayana University*	Indonesia	Law	2008	Comprehensive
Advanced Institute of Industrial Technology	Japan	Information Systems	2010	Project-Based

Singapore Polytechnic*	Singapore	Mathematics & Science	?	Project-Based
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In order to present the best possible range of programs in a concise form, this paper will classify the programs from the most common type to the least common type. To begin with, we look to the popular hybrid models of PBL. From there, we examine the best-practice in “near-full” or “comprehensive” PBL curricula. Although these are far fewer in number, they form the forefront of success stories of PBL in Asia. Finally, we analyze a sample of up and coming models: the inter-professional model and finally, the “One-Day, One-Problem” experiment.

3. The “Hybrid” PBL model

Almost all of the programs in the pioneering years of PBL in Asia were “hybrid programs” in the sense that they combined elements of a traditional curriculum, namely discipline-based lectures, and elements of PBL, namely the small-group, problem-based tutorials. Today, it is still the case that the overwhelming majority of school that use PBL in Asia do so following a hybrid mode.

3.1. “Hybrid” PBL for Medical Education

There are hundreds of hybrid PBL programs in medical education around the region. As an illustration, Airlangga University’s Faculty of Medicine, which the author briefly visited in June 2012, is representative of the general trend. Like in many other Indonesian medical faculties, problems with the quality of the Faculty’s graduates emerged at the turn of the century. Having observed the success of Gadjah Mada University’s transition to PBL, the School sent a team there for inspiration. The first hybrid PBL class at the university opened its doors to students in September 2000.

However, neither the Vice Dean for Educational Affairs nor his team of medical educators felt that a comprehensive PBL curriculum was suited to the needs of this established medical Faculty. As a result, only 30% of contact hours were allocated for PBL. The rest remained as traditional, discipline based lectures, with little or no integration between the courses. The Faculty also conducts skills laboratory classes independently of the PBL and lecture-based courses. This time allocation between PBL and traditional courses is fairly representative of Hybrid curricula in medical education across the region. Generally, the mark for what C.Y. Kwan has labeled “Type 2” and “Type 3” hybrid curricula (Kwan & Tam, 2009) – that is, curricula that use PBL to support the traditional methods of learning – seems to be between 40% and 20% of time allocation in the curriculum for PBL. Sometimes, programs may just be borrowing the skills-based laboratory exercises from PBL, as well as certain examination methods such as the Objective Structured Clinical Examination (OSCE) – without using the tutorial method. The OSCE has certainly been one of the more popular imports from Western medical institutions. Kwan describes so-called “hybrid” programs, the curriculum of which comprises of less than 10% of time allocated to PBL, as “decorative” (p.81). This is appropriate enough that we need not concern ourselves with such programs in an overview of PBL in Asia.

Given that the Faculty of Medicine of Airlangga University is a long-standing institution, some re-adjustments were needed to fit in small-group work. Practically speaking, rooms had to be accommodated for the new method, which means that large rooms were subdivided with partitions to allow for 10-person discussions. Beyond mere physical adaptations, the Faculty also had to invest in a tutor-training program for its members of faculty – a five-day training program including a theoretical component and a tutorial simulation were put in place. This type of initial tutor training program is fairly common in these Hybrid PBL courses, especially in medical education. The University of Hong Kong’s medical school follows a similar (if shorter) training pattern (Chan & Lam, 2006). From observation, it appears that hybrid programs in medicine place more emphasis on tutor training than hybrid programs in other fields of study in the region. However, once the initial training is completed, on-going training seems to be limited. A refresher course may be provided annually, as is the case at Airlangga, but where faculty time is limited and PBL is only a small component of the program, tutor training is usually relatively restricted.

3.2. Case study of a “hybrid” program in Applied Sciences

The use of a Hybrid model of PBL for applied sciences education in Asia can be chiefly found in Singapore (Tan, 2005; Tan, 2000) and in Hong-Kong (Forrester & Chau, 1999; Tang *et al*, 1997) polytechnic institutions. Like the hybrids in medical education, these institutions use PBL as part of a wider range of pedagogies, some of which are more traditional. One of Singapore’s Polytechnic institutions has been using PBL in its hybrid form since 1998 (Keng, 2011). The institution in question, which the author briefly visited in April 2012, sought input from a variety of actors in the PBL scene, including the late McMaster professor Howard Barrows (Hee, 2005, p.35). However, it was decided from the outset that PBL should only be mandatory in one the course for each diploma program. Other methods of teaching and learning would be used for the rest of the program. In a typical week, students might spend four hours in small group tutorials. The rest could be spent in laboratories, lectures or other forms of instruction.

The quantity and length of problem-scenarios varies, but in a given program, students can take up to five PBL subjects in eight weeks, with each problem lasting between three and six weeks, which some students find somewhat overwhelming (Keng, 2011). The institution promotes a seven-step problem-solving path, which is not unlike the original seven-jump method coined by Maastricht University (Schmidt, 1983), although in this case, the self-study period takes place at the fifth, rather than the sixth step. In this pathway, the identification of learning issues is consolidated in stage 4 (whereas it is split across two “jumps” in the Dutch method) and the process of synthesis and application is divided from the process of reflection and feedback (whereas it is

grouped in one final “jump” at Maastricht University).

Whilst traditionally, scaffolding in the PBL process is generally associated with the use of a “more knowledgeable person” (Kim & Hannafin, 2011, p. 407) – the tutor – as the principal scaffold, the institution in question has also been using hard scaffolds to support the problem based learning process. Hard scaffolds are aptly defined by Brush and Saye (2002, p.2) as “static supports that can be anticipated and planned in advance based upon typical student difficulties with a task”. In this context, the students use a FILA sheet (Keng, 2012), which stands for “Facts, Ideas, Learning Issues, Action Plan”, to tackle the problem scenarios. This tool is particularly emphasized for new students who are not familiar with the Problem-Based Learning process. In later years, students are able to take a more flexible approach and rely more heavily on other forms of scaffolding, including peer-scaffolding (Lee, M. 2012. Pers. Comm. 17th April).

Assessment in this model combines a series of formative and summative evaluations. As an example, in a given applied sciences subject, the formative part of the assessment consists in verbal feedback from tutors, open peer feedback, and optional consultations with tutors after the summative marks are given out. This takes place throughout the problem-solving process. The summative part of the assessment consists in a grade for performance during a 30 minute group interview, a mark for the students’ completed FILA sheet, research summary notes and submission of meeting minutes, followed by group oral presentations (Keng, 2012).

This polytechnic institution has placed a strong emphasis on its involvement in PBL, promoting it prominently in publications and in its own Center for Problem-Based Learning. However, the director of the Center made it clear that this institution promotes using a mix of pedagogies (Lee, M, 2012, Pers. Comm. 17th April).

4. Best-practice in “Comprehensive” PBL programs

While there are hundreds of Hybrid PBL curricula in medical education around the region, the number of cases of “comprehensive” or “Type 4” (Kwan & Tam, 2009) PBL curricula is far more limited. Those that do implement such a curriculum serve as best-practice exemplars for those studying PBL, even though the amount of academic publications available in English on these curricula is limited.

4.1. “Comprehensive” PBL curricula in Medical Education

In Indonesia, Gadjah Mada University (UGM)’s Faculty of Medicine, which the author visited in May 2012, has been implementing PBL since 1992. Although it originally undertook a “Hybrid” PBL approach, its curriculum has moved towards a comprehensive form of PBL since 2002, initially in its international program, and later in its entire curriculum. UGM drew inspiration from Maastricht University, and certain particularities of the Dutch method can be found there, such as the “Skillslab” and “Block-book” (Mundo, 2012). In Taiwan’s Fu Jen Catholic University, which the author visited in November 2012, the inspiration for the comprehensive PBL curriculum which began at the School of Medicine in 2002 (Tsou *et al*, 2009) came from a variety of influences, including former McMaster professors and the university of Maastricht’s curriculum (p.284). Interestingly, UGM had to contend with a pre-existing Faculty of Medicine in a time where PBL was not the norm whereas FJCU established a new school of medicine in a context of governmental support for the method (p.283). As such, whereas UGM progressively built up to a full PBL curriculum between 1992 and 2002 (Prakosa, J. 2012, Pers. Comm. 3rd May), FJCU was able to implement a near-full PBL curriculum in the 3rd and 4th year of its studies almost immediately. Herein lies another difference between the two institutions: the Faculty of Medicine at Gadjah Mada provides a five-and-a-half year program including two years of clinical rotations, during which the first three and a half years are spent in a block-based PBL program. By contrast the first two years at Fu Jen are spent studying “Common Education & General Sciences” (Tsou, 2012), whereas the fifth, sixth and seventh years are spent in clinical clerkships and internships, leaving only the third and fourth year for the use of biomedical problems in small-group tutorials.

The principles underlying both curricula are otherwise similar: an integrated approach to learning, where biomedical problems, clinical skills practicum and lectures are integrated around organ-systems and the life cycle. Both curricula make use of “block books”, or “unit manuals” which serve as a guide to students and tutors. The tutors are either basic scientists or clinicians, working with groups of 6-10 students in tutorials which last between 2 and 3 hours, twice a week. The problems are generally patient cases written by competent clinicians.

From the point of view the study of PBL in Asia, the most interesting point about both of these programs is the channelling of a learning philosophy which truly reflects the goals of PBL. Both programs are pushing for the core principles of PBL as defined by Chng, Yew and Schmidt (2011):

- (1) the use of authentic problems for students to work on without prior preparation so as to achieve the required knowledge, (2) students initiate their own learning whereby students work in (3) small collaborative groups under the (4) flexible tutelage of a tutor who guides the learning process. As problems are used as the starting point for learning, (5) the number of lectures are limited and (6) students would have sufficient time for self-study.

Both programmes limit their lecture times to 4 or 5 hours per week, which serve as support for the problems rather than the other way around. In both cases, the tutors receive training in facilitating, rather than lecturing students during tutorials, and tutorial observation in both institutions indicates that this is being applied in practice. Furthermore, both programmes are committed to providing an integrated learning environment – that is, where the biomedical problems, the skills training sessions, the laboratory-based work and the lectures all fit around a central unit theme, rather than compete with one another for time and resources, as can be the case in Hybrid curricula.

The success of these programmes comes as both the government of Indonesia (Nederstig & Mulder, 2011) and of Taiwan (Tsou, 2009) move in support of student-centered learning. In both cases, interviewees reported strong leadership pushing for change within the school and high buy-in from faculty. These examples show that although the Hybrid model largely dominates the medical education scene in Asia, successful implementation of “Type 4” curricula is possible.

4.2. Cases of best-practice outside of medical education

Law schools in Indonesia have also been feeling the pressure to reform to a more competence-based curriculum – as such, some of them have turned to PBL, with the assistance of foreign partners, as a means of implementing the governmental requirements. The author visited the Faculty of Law of Udayana University in June 2012, where a collaboration opened in 2008 with the Faculty of Law of Maastricht, aiming to “strengthen the Faculty of Law” of the Balinese institution (Mundo, 2012). This translated as a complete curriculum overhaul in which a new comprehensive PBL program was designed, modelled on the Dutch methods of PBL, to a large extent. This overhaul made the Faculty of Law of Udayana University the first in Indonesia to adopt a “Block-Based” approach across its entire curriculum, complete with block-books and lectures which fit into the block’s theme. However, given that the lectures come *before* the tutorial session, one might wonder whether this program sits squarely within the category of “Type 4” curricula, or whether it would be more representative of a “Type 3” hybrid model. The Faculty made it clear that the purpose of these lectures was to serve as an “introductory reflection” to a topic rather than to spoon-feed answers to the students (Supasti, K. 2012, Pers. Comm. 14th June) The spirit of PBL is clearly present in this institution, with a revamped library, new tutorial rooms equipped with smart boards and computers, a new information system designed to cater to the e-components of a PBL programme – including access to an online journal database – and new computer labs. The finishing touches to the programme were only put in place in 2012, so it remains to be seen what shape it will take after a few years of operation.

Other best-practice examples of the full implementation of PBL in selected courses (rather than at curriculum level) can be found in engineering in Malaysia (Khairiyah *et al*, 2004, 2005), among other fields of study – but whilst these programs are in themselves a tribute to the progress of PBL in Asia, the most striking development has been the establishment of new and radical takes on the classic PBL model.

5. New models for PBL in Asia

Beyond the standard typology of “hybrid” and “comprehensive” PBL curricula, some new models are appearing around the region. Most of these programs are recent inceptions, experimental in nature, and confined to one or a few institutions. To finish this overview of PBL in Asia, we choose to focus on two such examples: the Inter-Professional approach and the “One-Day, One-Problem” model. These are only examples, and we could also have opted to look at Project-organized PBL (Kolmos, 1996) in the region as it is applied in Singapore (Chin *et al*, 2012) or in Japan (Tozawa, 2009; Matsuzawa & Ohiwa, 2007).

5.1. The Inter-Professional Approach

The author visited Showa University in August 2012, which is one of Japan’s larger private health sciences institutions. It began to experiment with Hybrid-PBL in 2004, in its Faculty of Dentistry. By 2006, all four of its Faculties converted using a Type 2 or Type 3 curriculum. What is truly unusual about the case of Showa University is the choice made by the institution as a whole to integrate its PBL curriculum across the four disciplines (dentistry, medicine, pharmacy and nursing & rehabilitation services) during the six years of the curriculum, particularly in the field of Inter-Professional Education. This means that throughout their time at Showa University, the students are expected to work together in small groups comprised of students from all four faculties.

The interdisciplinary problems are written by teachers from diverse disciplines in a yearly scenario-writing exercise, and then given to the students to work through using a problem-mapping system. The author was able to observe this process at the Fujiyoshida campus. Using a color-coded scheme (figure 1), which makes it easy to follow the contributions of each discipline, the students draw out the connections in the problems as they understand them from their disciplinary standpoint, and are then able to compare with the issues highlighted by the other disciplinary inputs. During the clinical years of the program, the students work with their patients in inter-professional groups, thus simulating the practice of inter-professional cooperation in a hospital environment.

One of the more striking aspects of Showa University’s take on PBL, is its first-year curriculum (Imafuku *et al*, 2010, 2012). During their first year, all students are required to stay in a residential campus near Mount Fuji; they join the Tokyo campuses only in their second year. According to one of the programme’s managers (Kataoka, R. 2012, Pers. Comm. 15th August), the ideas of this campus borrow from the collegial systems of Harvard University and Oxford University – by enforcing inter-disciplinarity through residential arrangements whereby four students from the four faculties share a room as room-mates for the entire first year. This peculiar structure pre-dates the introduction of PBL at the university, but as Imafuku *et al* (2010, 2012) have shown, interdisciplinary PBL complements the first-year experience for students at Showa University. This first year comprises of a heavy liberal arts and languages component, coupled with instruction in the basic sciences. Imafuku’s longitudinal studies on students undergoing the program (Imafuku, 2012) show that this mode of PBL had some positive impacts on the group attitudes and communication skills of the students that he studied.

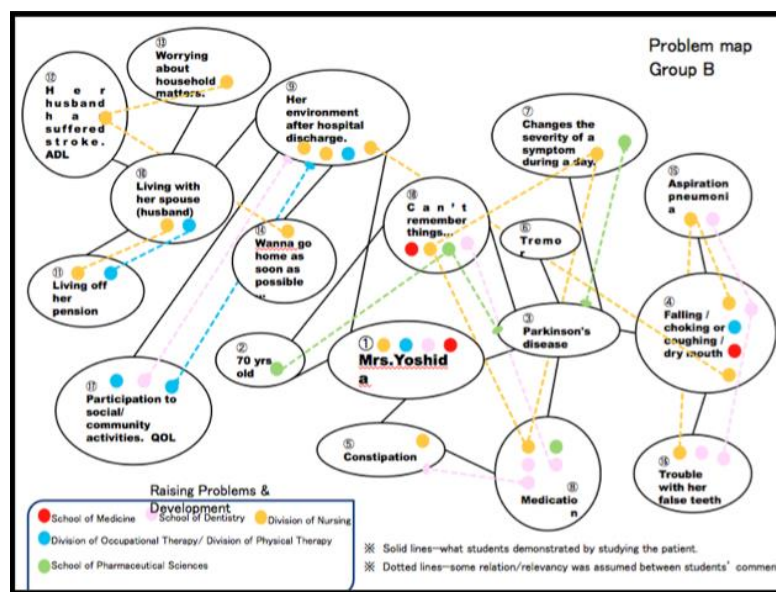


Figure 1. Problem-mapping at Showa University (Source: Kataoka, 2011)

5.2. The One-Day, One-Problem Experiment

The phrase “One-Day, One-Problem” was coined by a new Singaporean polytechnic institution which opened its doors in 2002, designed from the outset to work with this model. In 2006, the institution moved to a specially designed campus, the layout of which was engineering to facilitate the self-study process in a condensed cycle of one day. This was done by making the central feature of the campus into a large, open space referred to as the “Agora” at the center of which is the library. These central spaces are surrounded by pod-like circular structures, 8-9 storeys-high, that host the PBL classrooms and laboratories. The author was able to visit this campus and speak with some of its managers several times in 2012. If there is a single example of what Kwan and Tam call “pure” PBL (p.76) in Asia, it is this model, since no lectures are employed during the problem cycle – although the facilitator gives a short presentation with possible solutions to the problem during the third meeting of the day (Yew & O’Grady, 2012, p.10).

Yew and O’Grady (2012) give a comprehensive account of the structure of the One-Day, One-Problem approach to PBL. It is best summarized as follows:



Figure 2. The Five Phases of the One-Day, One-Problem Approach to PBL (source: Servant, 2012)

Each morning, the students confront a new problem – meaning that they handle five problems every week – in groups of 25, sub-divided into groups of five which are supervised by one or two tutors. The day consists in three group meetings and two study periods. Given the facilities available, the students are expected to stay on campus during the entire problem-cycle. The students receive a daily mark for their work, and their final evaluation for a given course is a combination of 15 daily marks and 3 understanding tests. Like their counter-parts from the “Hybrid” model of PBL for applied sciences, these students make use of hard scaffolds to tackle their problem scenarios. One of the founders of the polytechnic described the rationale as follows: “The philosophy that underpins the one-day, one-problem scheme is essentially a perspective of classroom happenings, in particular, the conditions that would enable the learners in a classroom to develop in a holistic sense, while acquiring the desired knowledge and technical skills along with the humanistic orientations expressed in the desired outcomes” (Alwis, 2012, p.43).

The challenge of habituating teachers to their new role as tutors is heightened in this polytechnic institution by the fact that than 65% of all tutors come from the industry rather than an academic background (O’Grady, G., 2012, pers. Comm. 20th Feb). As such, they usually have few insights into educational theory, but a wide professional and industrial experience (Goh, 2012). Research conducted at the institution (Williams, 2012) showed that 90% of the staff either agreed or strongly agreed with the pedagogy, although they did experience difficulties in putting in into practice (p.239). Training was an important part of the institution’s *modus operandi* since its inception. However, since 2009, the institution has established a three-phase tutor-training program in response to this challenge, leading to a Certificate of Completion at the end of the 104 hour-long PBL Foundation Program (Goh, 2012). In the subsequent three years, the staff pursues their training with a further 48 hours of core training, and the option of electives. The training combines elements of practice with theory of learning and aims to “immerse new facilitators in a culture of problem-solving, collaboration and reflective practice” (p.263). This setup makes it one of the most comprehensive tutor training programs in Asia. However, even with such heavy focus on tutor training, it takes between 2 and 3 years to make a good facilitator (Williams, 2012, O’Grady, G. 2012, pers. Comm. 20th Feb). The One-Day, One-Problem Approach has yet to be transferred to other institutions, and as such, the polytechnic that birthed the model is still its principal user. To what extent this model is transferrable outside of its original context has yet to be determined.

6. Many Roads to Problem-Based Learning

Two things become clear from this comparative overview of Problem-based Learning in Asia: firstly, PBL is an increasingly popular pedagogy in Asian higher education institutions. Secondly, the format of application of PBL differs both across the most popular fields of application and within those disciplines themselves. One might argue that a “Hybrid” curriculum in medicine has more in common with a “Hybrid” curriculum in engineering than with a comprehensive curriculum in medicine. Like Kwan and Tan (2009), this paper has chosen to focus on a format-based typology of the PBL curricula under scrutiny as their defining characteristic because this is the most obvious distinguishing feature, in the interest of a comparative overview. There, however, other means of classifying PBL curricula. For instance, Schmidt *et al* (2009) propose a different curriculum typology, which focuses on the intended learning outcomes of the PBL. They also highlight a point of crucial significance: the difficulty of cross-curricular comparison. Part of the reason, they claim, is that “much of the research effort and resources have been focused on curriculum-level outcome studies comparing problem-based with conventional education.” (p.230) In this instance, they were talking about cross-curricular comparison in medicine, principally in Western institutions. The challenge is heightened in the Asian context, where the language of publication can pose issues for cross-cultural comparisons, but even more so in the context of *cross-disciplinary* comparisons – a field which is still largely untouched in this regions of the world where the adoption PBL is still a relatively recent phenomenon.

It is the author’s experience after ten months of study and observation of PBL curricula in the region is that while the dialogue on PBL is increasingly cross-disciplinary, disciplines still play a dividing role. The explosion of interest in PBL in what is one of the world’s most dynamic regions offers a unique chance for the cross-fertilization of ideas. It would not be the first time that the paths of PBL in different disciplines cross. At McMaster University, an engineering course, borrowing from the methods of instruction of the medical school, was established shortly after the start of the first PBL curriculum (Woods, 1975; 1991; 1997). More recently, the new medical school at Aalborg University has done just the opposite, borrowing the methods of project-work and integrating it with the classical medical approach to PBL. It is clear from the cases highlighted above that there are in fact many roads to Problem based learning in Asia – and whilst the different fields often seem to be running on parallel paths, it will be interesting and enriching for all PBL practitioners to come to a cross-roads at some point in the near future.

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