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TRIED & TESTED: ISSUES & IMPLICATIONS FOR EDUCATORS IN PROBLEM-BASED LEARNING – RELEARNING FROM THE LEARNERS' PERSPECTIVE

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*The key engine that drives the new economic landscape is **KNOWLEDGE**. The demand for knowledge has intensified but the suppliers of knowledge – the education institutions - are still struggling to meet such a demand. It is not about just supplying content and technical expertise; it is also about how to produce a new breed of employees who can create and manage changing knowledge in the dynamic E-conomy. In response to this call, Temasek Business School revolutionised marketing education by adopting in its Diploma of Marketing (DM) programme the Problem-Based Learning (PBL) approach for the restructuring of its new marketing academic architecture. DM implemented PBL in ten Year 2 and Year 3 subjects in Semester 2, 1999/2000 and theme-based PBL for final-year learners in Semester 1, 2000/2001. An injection approach was adopted whereby PBL was planted within the current infrastructure. As in almost every change, resistance is a constant. This paper looks at the difficulties in PBL from the learners' perspective. The paper concludes with implications and issues for educators to enhance their effectiveness and relevance in using PBL. The findings also support the proposed fundamental shift in the marketing curriculum to adopt PBL as a philosophy rather than as a tool.*

INTRODUCTION

The advancement in information, communication and computer technologies influences the way a marketing curriculum is structured and the manner that it can be delivered. The instant connectivity and speed promote a seamless world and a new economic environment that concern all sectors. The education system must assimilate this change management in the curriculum to equip people with the skills to cope with the rapid pace of change.

Problem-Based Learning (PBL) is heralded as an innovative and effective way to promote learner-directed learning in today's academic architecture. It serves as a powerful tool in

empowering learners to take charge of their learning and draws on their diverse backgrounds, prior knowledge, networks and real-time information.

In keeping with the times, the Diploma in Marketing (DM) at Temasek Business School implemented PBL for ten second-year and final-year subjects in Semester 2, 1999/2000 and theme-based PBL for final-year learners in Semester 1, 2000/2001. The injection approach was adopted because PBL was planted in the existing infrastructure.

This paper describes the experience of adopting the PBL framework in the DM curriculum. It ascertains the level of difficulties that learners faced in this pioneering PBL attempt. The paper concludes with implications and issues for academic staff to enhance their effectiveness and relevance in using PBL. The findings also support the proposed fundamental shift in the marketing curriculum to adopt PBL as a philosophy rather than a tool.

BACKGROUND OF THE DIPLOMA IN MARKETING (DM)

The DM was launched in 1995. A three-year full-time course, it equips fresh GCE "O" level school leavers for the world of work and/or advanced studies in professional marketing. It receives an annual intake of about 140 learners.

In the first year, the DM learners are grouped with the other first-year learners from the Diploma in Business and the Diploma in Logistics and Operation Management to form a common category: Diploma in BUS/LOM/MKT. All learners in this category study general business foundation subjects. In the second year, the learners progress to their respective professional areas. It is at this time that DM learners read marketing foundation subjects. In the third and final year, DM learners choose to specialise in either Marketing Communications or Retail Marketing. During their final year, they are also required to complete a 12-week industry work attachment. Then, the traditional method of learning was teacher-oriented whereby the lecturers assumed the role as content providers. In a week, a learner attended a 4-hour class per subject, namely, a 2-hour lecture and a 2-hour tutorial. On the average, they handled six subjects per semester. Each semester consisted of an average of 15 weeks of instruction. Lecturers would focus on delivering specific subject content during lectures and would assess their learners' understanding based on what was delivered in the lectures and tutorials.

Learners were assessed based on the semestral examination and the course work which comprised continuous assessment throughout the semester. The semestral examination was a 2-hour formal written examination. The course work normally comprised evaluation on class participation, a mid-term test and a group project. The group project entailed them to apply what had been gathered in the lectures to their projects. The teaching philosophy focussed mainly on knowledge, comprehension and application levels of Bloom's taxonomy of educational objectives.

This approach to teaching and learning required learners to bring what was learned in the classrooms and apply them to the problems at hand, resulting in a passive problem-solving mindset. In line with Temasek Polytechnic's vision to be a world class institution and the Temasek Business School to be the preferred school, DM aims to "Be Ahead' preparing "school leavers for a future of dynamic change and helping them acquire the relevant knowledge, lifelong skills, character and a thirst for continuous improvement".

In keeping with the new economic landscape and its demands for knowledge workers, the Marketing Division strives to innovate its teaching and learning methodologies. It is with this in mind that the division decided to examine the PBL approach.

There are many reasons for promoting the adoption of PBL. One of the key attractiveness of PBL is that it allows learners to take charge of their learning decisions instead of mere data collecting. Learners learn through contextual problems and challenges that model after the real workplace. In addition, they learn to work in groups and achieve higher levels of cognitive development, independent investigation and creative problem solving (Rhem, 1998). This approach to teaching and learning pulls all prior knowledge to action more rapidly and promotes learning that adjusts to any context just as quickly.

Therefore, the proposed aims of PBL in the Marketing curriculum are:
- To empower students in their learning experiences
- To equip students with the essentials of marketing concepts
- To involve students as content providers themselves
- To promote teamwork, networking and sharing
- To enable students to be problem solvers
- To create and manage knowledge among learners

THE FIRST MARKETING PBL FRAMEWORK

In October 1999, all Marketing staff attended a five-half-day PBL workshop led by facilitators from the Temasek Centre for Problem-based Learning. The purpose of the workshop was to equip the staff with the understanding and working mechanism of PBL. The workshops covered an introduction to PBL, problem design, facilitation and assessment. After the workshop, staff applied what they had learnt by implementing the first Marketing PBL framework and designed PBL material for their subjects within the constraints of the traditional teaching structure of timetabled lessons and fixed resources. To ease learners' workload, an integrated problem was formulated for related subjects agreed by the affected subject lecturers. An orientation lecture on PBL was conducted for all learners during the first week of the semester to prepare them for the new delivery mode.

The Marketing PBL framework presented learners with an ill-structured problem from the onset of the semester. Learners were given a PBL kit that comprised the syllabus, lesson plan, assessment structure, problem statement, learning contract, peer evaluation form and learning issues.

The Marketing PBL approach was a task-centred activity that required learner-to-learner interaction in small groups. In this manner, interdependence, sharing and co-operation were fostered. Learners learnt to be accountable to their group and learning goals.

MARKETING PBL ROLES AND PROCEDURES

Learners formed their own groups. In the group, they assumed different roles. Social interaction was maximised as they planned their strategies and shared their findings. The first phase required them to identify and clarify the problem statement to find out what they

already knew and what they needed to know and do. Next, they learnt to map their own strategies to accomplish the work on hand. Learners became self-directed learners working within the constraints of resources and time. The second phase dealt with assignment of tasks, roles and feedback. Focus was on acquiring new information, reasoning and fitting them to the problem. Learners also experienced crisis management as they changed their strategies when they faced unanticipated barriers.

Lecturers assumed the role of facilitators or managers of the learning process. They facilitated the small group discussions and communicated at the learners' level. As a result, this interaction fostered acceptance and bonding.

As the Marketing learners were not academically qualified and motivated as expected, enabling sessions were introduced to help them transit to this new mode of learning. These enabling sessions or mini-lectures comprised 30% of the traditional lecture hours and were conducted in the first few weeks of the semester.

Such a teaching hybrid of PBL and enabling session approach meant that the learners would learn to acquire new knowledge and understand the theoretical aspects concurrently. The learners would then be well equipped via the PBL mindset while the enabling sessions served to get them started on the critical professional and technical skills, attitude, and broad-based thinking.

During the tutorials or facilitation sessions, learners presented their weekly meetings by sharing their strategies on handling problems, formulating learning objectives, assigning tasks, fact finding, reporting back and group contracting. These presentations were graded. Collaborative learning was promoted as the other groups sat in the presentation and were allowed to ask questions. All learners were also required to submit their individual learning journal that captured their learning reflections. At the end of the semester, each learner group submitted a written report and each individual in the group completed a peer evaluation and sat for the semestral examination.

As in any organizational change such as this new venture in restructuring traditional instruction along the problem-based approach, problems and issues were expected. The authors were concerned over such issues as the effectiveness of the implementation among learners and staff, adequacy of training among staff, effectiveness of course design and appropriateness of assessment tools used. Hence, surveys and various forms of evaluation were conducted to investigate the issues in the migration of traditional to PBL instruction.

DIFFICULTIES FACED IN PBL

This section highlights the feedback on PBL gathered from the DM learners throughout the semester based on regular meetings and end-of-semester sharing among academic staff, pre and post surveys on learners' opinions of the PBL approach, role of facilitators, facilities and management meetings with learners.

PBL Curriculum

"I am confused and lost. How do I know that I am looking at the right material?"

PBL starts with a case scenario. The learners had to identify the problem statement before they could proceed to answer them. In the traditional system, lecturers ask these questions. The learners struggled with uncertainty and ambiguity as they tried to craft their own problem statements. They kept asking for assurances on whether they were heading in the right direction. They discounted what their group members said and preferred to rely on their lecturers, whom they still looked up to as content provider and endorser of knowledge. This is true where learners are most challenged in the problem identification stage of PBL. In the pre-PBL survey conducted in July 2000, 39.7% indicated that they would face problems at the problem identification stage. In the post-PBL survey, this figure increased to 45.5%.

Delivery And Role Of Lecturers

"I don't understand. Why is this subject's PBL so different from the other subjects. There are so many different projects for different subjects! Lecturers also facilitate differently."

When PBL was implemented in Marketing, it was injected at the subject level. This injection approach was adopted by lecturers of the different subjects. With the exception of related subjects grouped for PBL, a majority of the subjects ran PBL independently of one another.

Each subject leader adopted different terminology and definitions of PBL based on his/her own understanding and experience. They had their own problem, requirements, deliverables, peer evaluation form, delivery mode, facilitation style and assessment. Hence, it was not surprising to note that learners encountered difficulties in the many versions of PBL in the course within a short span of a semester. This was confirmed in the DM focus group findings conducted in September 2000.

Learning in this turbulent mode, it was natural for learners to resume their traditional way of learning. They lost interest in PBL and relied on their performance at the semestral examination to compensate for their poor performance at PBL. Learning was still very much an isolated and piecemeal approach.

"Lecturers are not helpful. They answer my question with more questions. How can I communicate with them?"

The most common responses given by lecturers to the questions that the learners asked were: "why?", "how?" and "what?". Instead of clarifying their learners' doubts, lecturers caused more confusion and frustration due to their lack of tactical facilitation skills. After a while, learners stopped consulting their lecturers because they found the sessions to be worthless. Lecturers, on the other hand, thought that their learners were coping well with PBL since there were fewer questions raised. This was found to be true in the focus group study when the learners commented that different facilitators had different styles, with some more motivating and helpful than others, and they managed by turning to the more "reliable facilitators" and asking them instead.

Assessment

"I only want to know what will appear in the examination. My main worry is to pass the subject."

According to Brown et al. (1997), "assessment defines what learners regard as important, how they spend their time and how they come to see themselves as learners and then as graduates. Learners take their cue from what is assessed rather than what lecturers assert is important. Put rather starkly, if you want to change learner learning, then change the methods of assessment". This statement holds true for the DM learners because the traditional examination format and style to assess were maintained despite the change in delivery. This sent mixed signals to the learners. The benefits of PBL were undermined since learners were more interested in studying for their final examinations and ensuring that they passed the subject. It also did not help where there was little relationship between the PBL sessions and the type of questions that were set in the examination system. The examination system remained to assess rote learning, and was problem solving-based which required learners to draw on concepts taught to them earlier, while PBL work focussed on process skills and knowledge creation.

"Don't spend so much time and sleep on this. There is no marks for this part of the project. Project deadline is still far away."

"This" refers to the various stages advocated in the PBL process. Learners tended to be interested in finding the one correct answer or solution to the problem at hand. They wanted to get to the 'bottom' of it without pondering on the issues surrounding the problems, identifying unclear terms and issues, problem identification and so forth. In short, they were uncomfortable with unclear terms and ambiguity. Findings from a survey of final-year learners conducted by DM in September 2000 showed that 50.4% felt that they could handle ambiguity.

Group Skills

"It's all my group's fault. I am unlucky to have academically slower team-mates."

Learners were encouraged to form their own groups of approximately five learners each. The group membership remained constant throughout the semester. Like-minded learners tended to attract each other. Hence, the more academically able and motivated learners moved fast to form their own groups. These groups of learners were reported to enjoy the PBL mode of learning better. They were quick to define the learning issues. Members carried out their tasks as planned and with high quality. The groups were able to do more in view of fast and motivated learners. As a result, their projects were relatively better.

The academically slower groups were unsure and lost. They constantly sought assurance from facilitators on the uncertainty of their work scope. They had to manage their group dynamics in addition to the project on hand since their members had diverse needs and orientation. Hence, they frequently dealt with group conflicts. This group of learners tended to have more problems coping academically and managing group dynamics. They preferred the traditional method of learning where they were told what to do, what to study and where to go from here.

This observation is strengthened by the findings of a focus group study conducted with 11 DM learners in September 2000. The respondents commented that the most difficult phase in their PBL journey was in the beginning as there were weak group dynamics, no 'spoon-feeding' from the lecturers and the problem formulation stage was difficult. They also

commented that 'better' learners did better, and the performance of the 'weaker' ones was camouflaged by the team's performance.

"I hate to judge my friends. This peer evaluation exercise affects my friendship if I tell the truth."

Learners were required to complete the peer evaluation form individually. It created anxiety as they were doing it for the first and only time. Their first inputs were taken as final scores. In order to minimise receiving poor scores, they discussed and agreed to rate each other favourably. Hence, the peer evaluation form was conducted based on the wrong criteria. This was found to be true when learners raised this issue in the focus group study. The learners responded that it was difficult to assess individual performance (peer evaluation) because the members in the group would not fail one another. Peer evaluation did not help because of 'group alliances and power struggles'.

Resources

"The labs are always occupied. The red-spot books are out on loan. The lecturers are busy. There is no conducive place to hold group meetings."

With PBL, the learners engaged in self-directed learning. They made more trips to the library and computer laboratories to search for information. Learners lamented on the lack of conducive meeting places for their discussion. The staff did not factor in the impact of these resource constraints on PBL. Learners also needed to meet their lecturers more frequently for consultation. The heavy teaching workload meant that learners could only meet their lecturers at certain times.   From the DM post-survey findings in 2000, meeting rooms/space for meetings were perceived to be insufficient, with 38.2% indicating they disagreed.

Pre And Post-PBL Survey

Tables 1, 2 and 3 show the survey findings from the pre and post-PBL evaluation by final-year DM learners conducted in July 2000 and September 2000. These quantitative findings reinforced the informal sharing by the learners. In general, learners felt that PBL was a good way to learn and they assumed an active role in learning and group work. Because the current physical set-up is meant for a teacher-centred approach, learners encountered the lack in resources to support their learning such as classroom layout, lack of meeting space, etc. Learners also shared that problem identification was the most difficult stage in their PBL process. Hence, it was time consuming and full of uncertainty.

Table 1
Pre and Post-PBL Evaluation Survey by Learners: Top 5 Best Rated Factors

Rank	Score Difference	Learners' Feelings
1	18.5	The expectations of the PBL project were clearly explained
2	13.9	The PBL kit was comprehensive and relevant
3	13.3	I could recall content studied under PBL more easily than those presented in the lecture
4	12.3	PBL is a reflection of real life working situations
5	10.7	I contributed substantially to the group learning

Table 2
Pre and Post-PBL Evaluation Survey by Learners: 5 Worst Performing Factors

Rank	Score Difference	Learners' Feelings
1	12	The classroom was not conducive to PBL lessons
2	7.3	The learning journal did not help me to think better
3	4.1	PBL did not promote self-directed learning
4	3.8	There was insufficient meeting room/space for our meetings
5	3.3	PBL did not develop my creative and critical thinking

Table 3
Level of Difficulty in the PBL Process

PBL stage	Level of difficulty	Frequency (%)
Problem identification	Difficult	46
Problem clarification	Neutral	41
Crafting learning issues and action plan	Neutral	45
Working in groups	Easy	50
Peer-teaching and learning	Neutral	43
Crisis management/contingency planning	Neutral	48

ISSUES AND IMPLICATIONS

Types Of Examination

In PBL, the role of assessment must be re-defined. The weightage assigned to the examination and the types of process and content questions must correspond to the time spent in learning skills and the type of learning that has taken place, respectively. The proposed examination format should tap the high order of Bloom's taxonomy for analysis, synthesis and evaluation - critical skills that are relevant in a PBL environment. Open-book examinations using questions and problems to trigger thinking could be an effective way of achieving this.

Progressive Assessment

To ensure that learners learn throughout the semester, continuous assessment that examines learners' learning as they progress is recommended. A graded presentation every fortnight would make learners work consistently. The current PBL requires learners to submit their projects near the end of the semester. Lecturers grade and return the reports. An alternative is to split the report submission into 2 phases: Phase 1 submission to be based on oral presentation whereby the other learners and lecturers are able to provide feedback; learners would be able to re-work on their project based on this feedback and submit under Phase 2. This allows for a closer simulation of the real working environment where re-works are accepted.

Group Skills Clinic

In PBL, learners must learn how to transit from being a group to being a team. As proposed by Woods (1994), it is important that they know themselves and how to learn to be a team member. As such, each team member knows their own individual strengths and areas for improvement, and become comfortable with them. This translates into valuing diversity in a group and turning differing views of team into unity and oneness.

The moving of a learner from self-awareness to self-acceptance is made more critical as our DM students are young, aged 18 to 19 years old. Most of them are not only young in age, they also do not possess the maturity of seasoned adults who have working experience.

In PBL, the learners are thrown in a situation with ill-structured problems that they would encounter when they are in the real working world. Hence, PBL in the purest sense would see the dynamics of teamwork and learners' maturity, resulting in the learners making their own independent investigations, handling diversity, managing difficult people whom they will meet along the journey, and coping with different types of situations and adapting well. All these formative skills learned along the way supposedly will achieve higher levels of comprehension and learning.

As suggested by the focus group study, there seems to be an 'assumed' type of learners for PBL. These learners for PBL are those who know themselves very well and are confident to manage others' opinions of them, hence their ability to manage and handle diversity and difficult people in solving a problem. A group skills clinic that helps a learner to work in a group would be helpful. As suggested by Woods (1994), this clinic can identify the types of skills that make a learner a contributor and a person sought after by his/her peers and classmates. In addition, Woods (1994) recommended that a personality test be conducted to help learners better understand their personality. The results of the test can help the learners tell who they are and the way they prefer to learn and hence enable them to better manage the group and be improved learners.

Theme-based Problems

Learners complained about the number of projects that they had to handle. Projects were introduced to satisfy the content requirement of the subjects. Perhaps classifying the various subjects along major themes and drafting problems based on these themes would result in further integration. According to Rutherford and Ahlgren (1990), theme-based problems "help express ideas that transcend disciplinary boundaries and prove fruitful in explanation in theory, observation and in design" (Howard, 1999; Brouwers & Macdonald, 1996). Subjects no longer bind lecturers; instead, lecturers work together based on themes (Allen & Rooney, 1998).

Staff Training

The staff spent more time with learners in the PBL delivery than in the traditional method. Most of their time was spent on facilitation and consultation. They enjoyed the closeness with the learners. In facilitating real problems, the staff felt that industry experience was very crucial in giving advice.

Besides the change in role from content provider to facilitator, the staff felt that the greater challenge was to work in teams spanning across subjects in constructing well thought-out problems with definite learning objectives. The initial development of PBL materials was time consuming. The regular meetings among the staff to share their experiences increased the interaction and learning among them, a contrast to the traditional system where the staff work individually. The staff had to unlearn and relearn.

CONCLUSION

The Marketing Division embarked on its pioneering journey to adopt PBL in a bid to produce "flexible" learners that are ready for rapid obsolescence. PBL is heralded as an appropriate strategy to produce competent professionals and independent lifelong learners. However, the potentials of PBL can only be reaped if it is implemented correctly.

The injection approach that saw PBL as a tool in driving individual subjects within the existing system created more frustration for staff and learners alike. The negative feelings generated from imposing PBL on an existing system undermined the benefits that PBL could offer. Hence, PBL can never work well under these conditions.

As part of the continued search for excellence in teaching and learning, the Marketing Division is exploring another perspective: adopting PBL as a philosophy that supports a curriculum. Future work includes migrating from a teacher-centred marketing curriculum to a new academic architecture that promotes learner-centred learning using PBL as a philosophy.

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