

TRAINING FOR LEARNER-CENTRED PEDAGOGY AND CURRICULUM DESIGN AGENDAS IN STAFF DEVELOPMENT FOR PROBLEM-BASED LEARNING (PBL)

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Abstract

Staff development in higher education aims to work at two levels: to modify and transform the belief systems of teachers and to lead them towards flexibility and innovation from reflection and research; and to impart procedural knowledge in terms of strategies that can be used in teaching-learning practice. Curriculum development for learner centred pedagogy requires a sophisticated understanding of discipline-specific knowledge structures, the process of inquiry, and mediation of learning. The authors illustrate this argument through an analysis of a pilot run of a series of training workshops on issues in PBL curriculum development in a polytechnic in Singapore which is committed to PBL as the sole philosophical and methodological framework. The article explores issues such as prerequisites and rationale for training design and content, expectations from the participants, and possible training outcomes in such contexts.

Keywords

teacher training, workshop evaluation

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INTRODUCTION

The fact that teacher beliefs have a significant impact on innovation and efficacy of teaching and learning practice in higher education is well researched and documented (see Errington, 2001; McDiarmid, 1999; Pajares, 1992; Calderhead, 1996; Hofer & Pintrich, 1997; and Tatto, 1998). Often, these beliefs encompass teacher perceptions of 'the purpose of learning' and the roles of teachers and learners in such educational transactions. These beliefs result in dispositions of individual teachers and extend to the broader professional discourse used to define learning objectives, delivery of discipline specific content and assessment practices (Kane, et al.). Educational scenario in the recent times has had to contend with the demands from the multiple facets of globalisation – economic, cultural, technological and communicational aspects have changed and reshaped the nature and purpose of teaching-learning as it was known at the beginning of the twentieth century. Research on the construct of 'multi literacies' by Freebody, Ludwig and Gunn, as well as the New London Group and Street, argues that in addition to introducing cultural and linguistic diversity into the classroom, the social contexts in which the literacy practices of students are developed must also be accounted for in literacy pedagogy. Literacy and learning are 'situated' and embedded in social practice and hence must be reconceptualised as 'dynamic' semantic networks.

As a direct result, the agendas of education, curricula and staff development have changed dramatically to accommodate the dissolution of ideas of the preceding years and to rise to the challenge of new frames of reference. Gunther Kress describes these newer frames of reference as the:

- Institution and resources for education
- Geographical and spatial boundaries of institutions of education
- Educational audience
- Epistemology of knowledge
- Blurring lines between 'education as work' and 'education as pleasure'
- Inter relationship between the state and the market (industry)
- Locations of authority.

In short, the learner has become the epicentre of pedagogy with these frames of reference impinging on the process of 'meaning making'. Teaching-learning processes, then, need to be designed with the learner as the central figure of authority.

Problem-based learning (PBL) has been tried out as an instance of learner-centred pedagogy in medical curriculum for well over three decades (and subsequently in other domains as well) with well documented evidence by the studies of Norman and Schmidt in 1992, and Schmidt's study in 1993. Curricular content in such settings is transacted through 'PBL problems' (or PBL cases) which acts as a trigger for self-directed learning and reflection. To create or improve PBL curricula, it is important to understand the instructional conditions which result from effective PBL, the reasons for it and the strategies for creating/enabling such conditions.

It then follows that staff development initiatives in institutions committed to learner centred pedagogical approaches – such as PBL – have to deal with a dual agenda. On the one hand, is to prepare the teachers (in terms of intentions and action) for roles which 'require facilitation of learning' (in fluid, dynamic terms) rather than 'transmission of knowledge'. On the other hand, is also to endow the teachers with the expertise needed to carry out specialised tasks such as designing curricula or assessment for a specific setting. Such an agenda needs to address a few goals at once:

- To offer a rationale based on theoretical frameworks to support the recommended methodology - for example, problem based learning (PBL) as in this case where the 'voice of authority' shifts from the teacher to the learner
- To provide strategies to achieve specific goals - for example, designing PBL problems in a curriculum for Basic Science
- To support avenues for reflection and discussion in order to demonstrate and model the environment to which the teachers are being prepared.

Given these observations, the aims of this article are twofold: to discuss a specific instance of a staff development initiative focusing on curriculum development in PBL in an institution which is committed to PBL, and to highlight the challenges and considerations emerging from this discussion as issues of consequence.

CASE STUDY OVERVIEW

The Republic Polytechnic (RP) in Singapore is a vocational educational institution catering to young adults who have completed the Secondary School system. The Republic Polytechnic (RP) has adopted problem-based learning as the philosophical framework and methodological approach and the entire teaching-learning takes place through a

well-defined procedure known as the 'one day one problem' approach (for more detailed discussion of this procedural framework, see Venkatachary).

The internal document on 'The Philosophy of Facilitation Training and Certification at RP', produced by the Centre for Educational Development in the Republic Polytechnic (2000) states that the training and development of faculty as teaching professionals is a priority at the institution. The staff development initiatives in PBL for Academic Staff at RP are formulated in two tiers: a week-long workshop, which is foundational in nature and is pre-service mandatory training, and an ongoing series of workshops which offer inputs in specialised areas for further professional development. It is the latter which is of interest to this discussion.

In 2004, a series of workshops on PBL problem crafting was conducted; they covered issues, methods and case studies with a view to providing strategies for use and a base of expertise. They addressed the issues of providing:

- a grounding in the conceptual framework for learner-centred pedagogy and the emergence of PBL
- knowledge and application in 'specialist' terms leading to staff finding 'niche' areas to work on and/or to engage in research in teaching-learning (in the form of engagement in analysis, review of PBL literature and case studies from other institutions through guest presentations).

The discussion which follows focuses on the rationale for the content and structure of these workshops, the design and conduct, and a summary of participant feedback with a view towards a critical analysis of the issues and considerations for design and key lessons learnt from the experience.

The profile of academic staff suggests that almost none of them have any prior experience or any knowledge base in pedagogical practice and/or PBL. With a few exceptions, they fall under the categories of those who have worked for the industry (in the domains of Business/Engineering/Bio medical sciences or IT), or young graduates with no work experience. In either category, there was a clear need for training inputs in curriculum design for PBL. Hence the workshop content needed to offer:

- An overview in conceptual terms
- Literature on the specific issues

- Activities (which stem from the conceptual framework) in which participants can engage
- Structured discussions (for sharing views/issues)
- Case studies of PBL practice in other institutions.

In 2004, three sets of workshops (each workshop spanning two workdays) were conducted on PBL problem design. They were planned and executed as ‘a series’ in order to underscore the linkages in the conceptual framework though registration for these workshops was voluntary. In order to facilitate attendance, these workshops were conducted during three term breaks in the academic year.

The themes of the workshops were:

- The Nature of Inquiry and PBL problem crafting
- Discipline specific Issues in PBL Trigger Design
- Logical Reasoning as a Design Imperative in PBL Curricula.

THEORETICAL BACKGROUND FOR TRAINING CONTENT AND DESIGN

Having argued the case that students drive the learning and ‘construct’ knowledge in multiple, dynamic ways in PBL, the ‘problems’ or ‘cases’ which offer a starting point for the learning activities are critical. Schmidt noted in 1993, and later Dolmans and Snellen-Balendong, 1997, also noted that the nature of student learning is to a large extent dependent on the quality of the problems presented to the students.

Broad principles emerging from such studies correlate with the steps that the students take to reach the learning outcomes from a PBL problem/case and the principles of design that a curriculum developer or an expert must then keep in mind while crafting a problem. Dolmans and Snellen-Balendong's work in the Medical School of the University of Maastricht has explained the approach of students from the problem to the learning outcomes in seven steps (Seven Jumps) and have classified PBL cases in terms of problems requiring ‘explanation’ ‘study (of content)’ ‘analysis’, ‘discussion’, ‘strategy’ or ‘multilevel approach.’

PBL operates on the premise that learning is ‘activity-oriented’ and stems from the activation of students’ prior knowledge – as in a cognitive landscape that is associative in nature and functions like a network structure with nodes being constantly modified,

renewed and added to. Therefore, PBL problems mediate between the ‘experiential’ aspect of a phenomenon (often from the physical, material world; hence the emphasis on PBL problems being close to ‘real life’) and the ‘formal, academic’ principles (of a discipline) which underlie the physical phenomena.

In cognitive terms, Goldstone and Barsalou (1998) summarize that this premise denies the requirement that formal, academic knowledge be amodal and abstract. Instead it assumes that abstract knowledge can be constituted from perceptual bases.

Drawing cues from these strands of research, the training content was designed to focus on the following questions:

- How can we decode the appropriate conceptual knowledge (from a given discipline/content) suitable for a specific learning outcome/audience? Can a principle (from a discipline) be abstracted from the surrounding layers of methods and factual information?
- How do we encode the chosen content in effective ‘experiential terms’? What decisions need to be made in terms of strategy, media and format? Why are they significant?
- Why are the principles of self-regulation and logical reasoning important in designing PBL curricula?

STRUCTURE AND CONTENT OF WORKSHOPS

The structure of the two-day workshops in this series has been designed to include a certain measure of specificity, analysis of and reflection on the curricula in the RP. Day 1 of each of these workshops has been devoted to participants engaging with the conceptual framework through ‘activities’ (in small teams) and discussions. Day 2 was characterised by plenary sessions - guest presentations/case studies to offer parallels and comparisons to the practice in the RP.

The activities of Day 1 have been supported by scaffolding in the forms of

- Worksheets (a set of questions for the participants to engage with – individually and in teams)
- ‘Real’ PBL problems from various modules/disciplines as a sample for analysis in response to the questions in the worksheet.

In each workshop, the worksheets have been designed in such a way that the participants go through the ‘process’ that the students are expected to demonstrate in the classroom. All activities are done in small teams of four or five participants – grouped according to their basic disciplines/areas of specialisation. The questions in the worksheet are an attempt to concretise the conceptual framework (discussed above), as well as to ground the PBL practice in the Republic Polytechnic (RP). Therefore, the questions pertain to the specific format features of the PBL problems in RP in relation to the overall conceptual framework. The worksheet-based activities have been supported by ‘Facilitator Guides’ which explain the rationale and range of anticipated responses in order that the trainers may engage with the teams of participants.

Here is an excerpt to demonstrate this attempt from the workshop on ‘Logical Reasoning as a Design Imperative in PBL Curricula’ (see Venkatachary):

The purpose of this activity is to make the steps in reasoning process explicit, with the assumption that like all processes reasoning is systematic and implies a certain sequence in thinking. The questions move from a general, ‘experiential’ way of looking at the base idea to a more analytical stance with regard to the sample PBL problems:

Items from worksheet for participants	Item from accompanying Facilitator Guide for Trainers
<p>Item 1</p> <p><i>Instruction text</i> Thinking critically about anything (an event, an issue, a concept etc) is a systematic process. One makes logical associations by identifying certain signs or ‘cues’ and then draws a conclusion or makes an argument. Now, in view of this, respond to the question below:</p> <p><i>Question</i> If someone were to ask you why ‘petrol does not put out fire’, what steps in thinking would you go through while answering the question in your mind?</p>	<p>Background to Item 1 (Question 1)</p> <p>This is a warm up question. All of us think critically about issues or events or situations. Are we aware of ‘how’ and ‘what’ we are doing when thinking things through? That is the point of this question.</p> <p>The typical response should be along the lines of:</p> <ul style="list-style-type: none"> - ask questions - answer them through associations/logical reasoning/research - make a decision on whether to believe what you find ... - think about the quality of your conclusion etc. <p>Variations on these steps are possible.</p>

<p>Item 3</p> <p><i>Instruction text</i></p> <p>We have all been reared on the lecture-tutorial system of teaching-learning. A lecture is a 'considered' presentation from an expert's point of view. If you agree with this, how would you respond to the question below?</p> <p><i>Question</i></p> <p>When you are writing a lecture to address a similar question: (for example: What is colour? What is adiabatic expansion of gases) how would you organise the information?</p> <p>Do a brief outline of a lecture considering questions such as:</p> <ul style="list-style-type: none">- What are the key concepts?- What are the important learning outcomes?- What are the topics and sub topics in this content area? How are these (sub)topics interrelated and connected with each other?- How do I sequence these in presentation?- What is my rationale for the sequence? <p>Feel free to choose content that you are familiar with.</p>	<p>Background to Item 3 (Question 3)</p> <p>Transition from question 2 to this one can be done in this way: While question 1 asked us to think about strategies we use to 'clarify our personal understanding' (of something), question 2 asked us to think about strategies we use to convey our understanding to others. (in both the cases, the exercises were either personal (introspective) or informal (as in a conversation, may be). Now, what would we do if we have to convey our understanding in more formal ways – as in a lecture?</p>
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<p>Item 4</p> <p><i>Instruction text</i> Take a problem-worksheet combination from the sample from a module you are teaching/familiar with. Analyse the chosen problem-worksheet combination and respond to the question below. Note that the question has two sets of questions. Answer both sets of questions.</p> <p><i>Question</i> <i>Question Set 1:</i> (pertains to the organisation of questions in worksheet: learning as a process)</p> <ul style="list-style-type: none"> - What is the key concept? (intended learning outcome?) - How do the questions lead to this outcome? - Why are questions asked in a certain sequence? - What conclusions are likely from the students' point of view? - In order to progress in the way you envisage, what information is given? What is your starting point? <p><i>Question Set 2:</i> (pertains to the strategies used to make the reasoning explicit)</p> <ul style="list-style-type: none"> - Identify any particular strategy/or combination used for reasoning in the sample you are studying. <p><i>Note: Some examples of strategies for reasoning can be: sequential presentation (chronological, cause-effect, etc.), contrasts (to set forth points of view), contradictions (makes one wonder why it exists)</i></p>	<p>Background to Item 4 (Question 4)</p> <p><i>Note for Version 1: PBL Problems with Worksheets</i> This is an integrative question. It is complex and has two parts. If the participants are daunted by it, follow this technique:</p> <p>Tell them to pick a problem trigger/worksheet combination that they know well. Address the questions in Set 1 – as they pertain to the way questions are 'sequenced' logically. Sequence plays out as a 'cue' in reasoning. The questions in Set 2 draw attention to strategies which allow the content to be placed within a reasoning framework. Some examples are given in the activity item itself. Give more examples, if you like.</p> <p>Discuss issues revolving around the logical interconnections of the subtopics and how that informs us about the processes involved learning (initially in a lecture as in question but thinking about linking this to PBL problems). Also draw attention to the reasoning behind sequencing the lecture in a certain order and how it plays out in the PBL context.</p>
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Table 1: Elements of Design in Training Content (See Venkatachary)

The activities of Day 1 were consolidated and summarised on Day 2 in each of these workshops through a more general, plenary session of case study presentations and discussions offering comparisons and contrasts to the RP context.

The table below shows the workshop content organisation for the year 2004.

<i>Focus of Day 1</i>	<i>Description of Activity Content</i>
<p>Activity on 'deconstruction of content' as a way to decode conceptual knowledge (from discipline-specific content)</p>	<p>1. Describe the content of the trigger from the expert's point of view. <i>(Function: Describing the content of the trigger helps you identify specific bits of information in it which help stimulate/support learning.)</i></p>
<p><i>Activity Outline</i> A six-step method to 'deconstruct' content in order to abstract conceptual knowledge</p>	<p>2. State the expected prior knowledge in relation to a specific problem. <i>(Function: The students see the trigger at the experiential level at the first instance. Making the expected prior knowledge explicit allows you to clarify the reasoning which (you expect) might surface in their thinking at this time.)</i></p>
	<p>3. Based on your analysis of content in Step 1, state the anticipated interaction between prior knowledge and the trigger. <i>(Function: Making the anticipated interaction between students' prior knowledge and the trigger explicit can clarify the line of reasoning which links the experiential aspect [first level response to the trigger] and the more formal, academic aspect of learning in PBL.)</i></p>
	<p>4. What tasks/specific activities do you expect to arise from Step 3? <i>(Function: Articulating the precise tasks expected for the achievement of learning outcomes supports two purposes:</i> <i>(i) it clarifies the scope of the problem in terms of the formal/academic aspects of learning, often implicit in the trigger;</i> <i>(ii) it also highlights the gaps in students' knowledge (learning issues) that are expected to be bridged through inquiry.)</i></p>
	<p>5. In your analysis of the content of the problem, what are the key associations in reasoning? <i>(Function: Making the interconnections in the topical content explicit supports efforts to pitch the PBL problems at the level of fundamental principles of a discipline.)</i></p>
	<p>6. What fundamental principle (from the discipline/content area) does this problem focus on? <i>(Function: Abstracting the key principle being addressed in a PBL problem helps in distinguishing between</i> <i>(i) questions which may be directed at information in isolation</i> <i>(ii) questions which consist of connected information to trigger learning.)</i></p>

<p><i>Day 2</i></p> <p>Focus on discussion of generic issues in knowledge structures and the process of inquiry</p>	<p>Plenary session and discussion on modes of inquiry, knowledge structures within across disciplines, and epistemology of knowledge <i>(External resource person from the National University of Singapore)</i></p>
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April 04: Theme: The Nature of Inquiry and PBL problem crafting

The second workshop for 2004 is as follows:

<p><i>Focus of Day 1</i></p> <p>Activity on 'encapsulation of content' in the form of PBL trigger</p> <p><i>Activity outline</i> Analysis 'strategy', 'media selection' and 'integration' to provide 'affordance' in learning</p>	<p><i>Description of Activity Content</i></p> <p>Questions to provide scope for analysis and reflection on 'authenticity' as a trigger for activating learner's prior knowledge media affordance and the choice of strategy, format and medium to encapsulate content</p>
<p><i>Day 2</i></p> <p>Focus on sharing of specific practices and experience from different Schools of study (from year 2003)</p>	<p>Colleagues from RP shared their practices and experience in designing PBL problems in different disciplines in view of the student responses to the specific cases presented.</p>

June 04: Theme: Discipline-Specific Issues in PBL Trigger Design

The third two day workshop held in September, 2004, focused on Logical Reasoning:

<p><i>Focus of Day 1</i></p> <p>Activity on 'identification and analysis of 'cues' in reasoning'</p> <p><i>Activity outline</i> Appreciation/recognition of reasoning as a systematic process with certain 'organising principles' and 'sequence'</p>	<p><i>Description of Activity Content</i></p> <p>Questions leading from 'thinking' about everyday phenomena to specific components in the PBL problems as 'cues' for reasoning. Worksheets were customised to deal with specific components of problems being designed in different disciplines in the RP context.</p>
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<p><i>Day 2</i></p> <p>Focus on offering parallels and comparisons in curriculum design practices in PBL in other institutions. To establish that despite variations in methods/structures, conceptual frameworks of design remain similar.</p>	<p><i>Interactive presentations on</i></p> <ul style="list-style-type: none"> - Hybrid approach to PBL in medical curriculum in the Faculty of Medicine, National University of Singapore - Research and practices of curriculum design in the University of Masstricht and University of Hzeeland, Netherlands. - Overview of cognitive structures and principles underlying the case studies resented. <p><i>(External resource persons from National University of Singapore and University of Hzeeland)</i></p>
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September 04: Theme: Logical Reasoning as a Design Imperative in PBL (curricula)

Table 2: Content and Design of Training in 2004

SUMMARY OF PARTICIPANT FEEDBACK AND FOLLOW-UP (AS CARRIED OUT)

At the end of each workshop a short survey was open for the participants to offer feedback. Feedback was entirely voluntary In the case discussed here, there were 78 participants in the workshops and all of them gave feedback. The percentages given later in the discussion are drawn from this participant group. The survey questions pertained to:

- The relevance of workshop content for ongoing work (in conceptual and strategic terms)
- Adequacy of Resources
- Trainer efficacy.

The survey was made up of 6 items (with a four point rating scale) and 4 open-ended questions.

The Nature of Inquiry and PBL problem crafting

Key Indicator	Summary of Feedback	Follow-up action taken from comments of participants
Relevance (of content to their work)	96% agree/strongly agree; 4% disagree' <i>Issues:</i> - Traditional PBL problems may not be applicable to RP PBL - Unsure if reverse engineering works (in terms of using the 6-step method for content analysis)	Worksheets for activities have been refined for greater clarity in terms of 'tasks' and 'expectations'

Resources (usefulness)	86% agree/strongly disagree; 14% unsure /disagree <i>Issues:</i> - Too much to read - Could be more relevant to the topic - Readings dry	Since participants failed to read the pre-workshop readings recommended, in June, a review of literature was attempted while in September, readings were cited in presentations and participants were referred to them (for follow up)
Trainer efficacy	92% agree/strongly agree; 8% unsure/disagree <i>Issues:</i> - Some were good; some were not. - Not sure if guest speaker's session was useful in crafting PBL problems	

June: Discipline specific Issues in PBL Trigger Design

Key Indicator	Summary of Feedback	Follow-up action taken from comments of participants
Relevance (of content to their work)	96% agree/strongly agree; 4% 'disagree' <i>Issues:</i> Problem crafting needs more practice	
Resources (usefulness)	75% agree /strongly agree; 25% disagree <i>Issues:</i> A lot of sample problems are given but not a lot of materials are given on how to craft good problems or which is the more efficient style to adopt. Better if more resources were given	Realised that participants preferred to be able to 'go to the sources' in addition to having a review. Offer of resources modified in September (see earlier comment from April).
Trainer efficacy	83% agree or strongly agree; 17% disagree <i>Issues:</i> Facilitator is too focused on having discussions. Discussions may be effective for those who had immense experience with problem crafting but not otherwise. Cannot relate without much prior experience designing problem triggers.	

September: Reasoning as a Design Imperative in PBL (curricula)

Key Indicator	Summary of Feedback	Follow-up action taken from comments of participants
Relevance (of content to their work)	96% agree or strongly agree; 4% disagree (No negative comments to substantiate disagreement)	

Resources (usefulness)	92% agree or strongly agree; 8% disagree <i>Issues:</i> The titles look relevant. Having said that I think we are not given time to read. I don't know if anyone did.	
Trainer efficacy	96% agree or strongly agree; 4% disagree No negative comments to substantiate disagreement	

Table 3: Summary of participant feedback 2004

The qualitative comments from the participants are organized below in terms of two key themes: relevance of content and effectiveness of format. A sample of comments is given in the table below:

Relevance	Effectiveness
"The most insightful part for me was the emphasis on metacognition as a fundamental aim in what we do with PBL" "The interaction and ideas sharing and exchanges from the facilitator and participants"	"Very interactive. External speakers - different perspectives" "External speakers giving us a different perspective view of PBL from what we have" "Able to relate and compare what others were doing with our methods" "Grouping us in teams and discussing through a series of questions" "Looking at sample problems by other schools & centres" "Ample interaction with facilitators from different departments and centres to share their views and philosophy on problem crafting" "Allow different schools and department to present their the way they craft their problems, share their difficulties and how they try to overcome it"

Table 4: Sample responses organized under themes

DISCUSSION OF ISSUES AND LESSONS LEARNT

One of the key issues facing staff development in higher education is to strike a balance between the conceptual, reflective aspects and the pragmatic, immediate

considerations of teaching learning practice. This is somewhat exacerbated by the fact that practising teachers often do not see the close linkages between their practice and research.

With this consideration, the training plan, content, and strategies discussed in the case study in this article have been assembled. However what issues do we have to contend with having had a pilot run for one year? Formal feedback from surveys and conversations on campus seem to suggest that youth and lack of experience in teaching do have an impact on the participants' response and their understanding of these workshops. While there is positive attitude to new knowledge and learning, there is also marked preoccupation with 'quick fix' solutions for their immediate context. It is possible to infer the following from this situation.

First of all, there is the issue of bridging the gap from the current profile of the staff to an intended, desirable level of expertise in certain aspects without necessarily compromising on their existing strengths. Complex as it may sound, this observation stems from the fact that the Republic Polytechnic (RP) has deliberately chosen its Academic Staff from the young, vibrant group of fresh University graduates with no formal background in pedagogical practices and curriculum development. The rationale for the choice of a certain profile stems from organisational and operational considerations and may pertain to aspects as varied as institutional image/brand, the notion that people adapt quicker to a system if they do not have to 'unlearn' earlier practice, and the view that a certain demographic and personality type may find it easier to 'relate and interact' with the young students.

However, PBL as a methodology is firmly grounded in research and findings in the domains of cognition, pedagogical practices, curriculum development and instructional design. The ability to respond to the available research in an active, personal way and to arrive at a rigorous, interpretive understanding of research feeding into personal practice – be it facilitation of a PBL classroom or the design of PBL problems/curricula is imperative for functioning as a specialist in this environment. Of course, there is the further step in the agenda of contributing to the body of pedagogical research in original ways from one's own practice.

A major agenda of the training programme discussed in this article has been to prepare the staff for their roles as specialists in PBL curriculum development in RP and to enable them to engage in action research within the context of their practice at the same time. It is not possible to conclude if the design intention was met by the reality in implementation. Some observations in this regard (as evident from feedback) have been:

- Participants' inability to optimise on/assimilate the resources provided during the workshop
- Certain gaps in extending specific analysis and insights (from their teamwork on activities) to be more generative and holistic in understanding the structures and principles of PBL philosophy and variations in practice.

The authors argue that integrative understanding and innovation are engendered from reflection on personal practice combined with knowledge of variations available including structural, procedural aspects and the reasons for difference from one's own practice. This is as much 'a habit of mind' of an individual as 'the institutional climate' of organisations. Perhaps, these aspects need a little more time to mature in an individual setting as discussed in this case study.

The view that PBL is 'activity oriented' and 'experiential' has been emphasised in the foundational training in PBL (the five-day workshop mentioned at the outset in this article). While the purpose of that training programme is to give a grounding in the procedural aspects ('how to' questions) of RP PBL approach, an unintended offshoot of this training seemed to have been the fixed notions against 'conceptual, academic' content in training. However it is important to realise that the task of effective curriculum design – particularly in PBL – depends on one's ability to 'mediate' and 'orchestrate' the 'conceptual and experiential' layers of knowledge. Knowledge, strategies and methods in this regard cannot be broken down to the mere procedural aspects in order to facilitate assimilation. On the contrary, despite the scaffolding provided, the participants in training do need to make an effort to reach towards the desired level of understanding and expertise.

The major purpose behind reporting the case study of this pilot run of the training programme has been to highlight the challenges of designing and implementing staff development initiatives in a dynamic sub-domain like PBL. Conventional approaches to curriculum development which look upon an inert, fixed content would not suffice here. On the other hand, in order to engage in meaningful dialogue on pedagogical practice, what design parameters are reasonable – particularly in view of time, training strategy, nature of content and most importantly level of indirection?

It is true that 'transfer' of learning does happen only if and when the student in a classroom or a participant in a training workshop makes the connection between 'what is' (the immediate context of learning) to 'what can be' (the innumerable variations on the immediate context where application of the learning may be reasonable). The spectrum and possible connections are both intra disciplinary and inter disciplinary. The strength

of PBL lies in offering practice in making such associations. Curriculum design practice in PBL therefore needs to consider and mediate this aspect well. The authors would argue that at least one of the key agendas for staff development in PBL curriculum development would be to help 'experts in a discipline' to learn to mediate between the intra disciplinary connections which make for a domain of study and the inter disciplinary connections which constitute 'knowledge' and 'learning' as a global entity and life long pursuit.

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