

# The Transformation from Teaching to Facilitation; Experiences with Faculty Development Training\*

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A shift from teaching to learning is characteristic of the introduction of Problem Based Learning (PBL) in an existing school. As a consequence the teaching staff has to be trained in skills like facilitating group work and writing cases. Most importantly a change in thinking about teaching and learning will have to be realized. In the implementation of PBL it makes a difference how the core features of the problem and the role of the facilitator have been defined. This paper will present components of a PBL faculty-development training programme and discuss the relevance with respect to a faculty development strategy.

**Keywords:** faculty development; PBL training; Change to PBL

## 1. Introduction

In traditional education the teacher holds a central position. The teacher has access to the relevant knowledge and determines how this is transferred to the students, following his own preference of 'personal theory of teaching' [1]. Problem Based Learning (PBL) is often said to involve a paradigm shift, or more specifically a change of focus from teaching to learning [2]. Rather than disseminating their knowledge through lectures or instructions the teacher is expected to design a challenging learning environment and to facilitate the independent student centred learning process.

As a consequence, faculty development programmes aiming to train teachers in new skills are an integral part of the implementation of PBL. Teachers need to learn how to design a learning environment, how to write an effective case and how to facilitate a group process, but more importantly they need to re-define their professional identity in a process of culture change.

Based on many years of experience in running PBL training programmes as part of change processes in universities all over the world, this paper presents a general outline for PBL a faculty-development training programme, commenting on the usefulness of the separate components.

## 2. Different PBL models

By the end of the sixties of the last century PBL emerged as the principal educational method at the new medical curriculum of McMasters University in Canada [3]. PBL aims to involve students actively in the learning process, challenging them to work on problems from practice. Inspiration for the development of PBL principles comes from pedagogues

and psychologists like Jérôme Brunner, Maria Montessori, John Dewey, William Kilpatrick, Carl Rogers and Donald Schön [4]. Theoretically, it fits nicely in the constructivist understanding of cognition from Piaget and Vygotski [5, 6]. The work of David Kolb on experiential learning is also often mentioned in this context [7]. In practice PBL takes many shapes, resulting in a plethora of PBL models, ranging from PBL lectures, where the teacher builds his presentation around a case from practice to self-organized group work outside formal education. Several authors made attempts to classify different types of PBL [8–13].

The most important differentiation is the one between problem-based and project-organised learning. Both approaches originate for a large part from the same pedagogical background. Except, maybe, concerning the Marxist political orientation that influenced the development of Project Organised Learning in Europe, in particular in Germany and Denmark [14]. The section below focuses on the main differences between the 'project' PBL and the 'problem' version.

A project provides students with a challenging task that usually requires more than one single person to complete [15–17]. Working out a solution among themselves in a small group is highly motivating for the students, as recognized by Kilpatrick. In working on the project the students apply knowledge they acquired before and they learn new knowledge when they need it [18]. The objective of a project is to solve a specific problem. As a consequence, it is by definition limited in time: the project ends when the problem is solved. Going from one project to the next the students gain experience in collaborating in a team in solving authentic problems from professional practice [19]. Working on problems from practice has been

a part of many university curricula for many years. For instance, Barry Maitland, the dean who introduced PBL in architecture at Newcastle University in Australia observes that ‘Architecture courses around the world almost universally retained one problem based learning feature derived from the origins of architecture education in tutelage and apprenticeship to a practitioner’ [20]. Interestingly this same architecture studio learning stood model for the development of the concept of the ‘reflective practitioner’ by Donald Schön [21].

An alternative to having a group actually solve a problem is to trigger the learning process through using a problem as input for a group discussion. In such a case the ‘problem’ can be a description of a natural phenomenon, challenging the group to come up with a satisfactory explanation or a situation from professional practice as starting point for the discussion on the ensuing learning process. The choice of the type of problem depends very much on the profession the curriculum is training for. Working in a project is a natural preparation for a professional career in engineering. For other professions such a link to a project is less obvious. In medicine, law or business administration it makes more sense to start with a case, or some observations in the context of practice.

A good case description reflects professional practice at a day-to-day level, i.e. a problem should not be a very rare combination of symptoms, or a situation so complex that even the most experienced practitioner will have difficulty overseeing everything (see Norman for a comprehensive analysis of the concepts problem based learning and problem-solving [22]). Unlike with a project assignment relevance is the most important criterion for the quality of a case rather than authenticity. The next aspect that differentiates between different versions of PBL is the location of the learning. PBL group work requires rooms to accommodate small groups rather than large classes or lecture halls. Work on an authentic technical project is done preferably in a laboratory or workplace, rather than in a classroom. Creating the right space for learning often is a big logistic challenge in setting up a PBL curriculum.

Variations in teacher roles are connected to different types of PBL. In the Maastricht PBL model the role of the tutor was defined strictly as a process facilitator. The tutor does not teach and consequently does not have to be a content expert. Students can consult content experts on request. See Schmidt and Moust for more details on the Maastricht tutorial groups [23]. By contrast the project facilitator in the Aalborg model has to be a content expert, guiding students to make the right choices. Still the students are responsible for their own group

process. There are schools that label their curriculum PBL where actually the teacher is in charge and assumes the role of project leader. However, when the teacher takes on much of the responsibilities of running the project, the motivation of the students is bound to decrease [19].

Also the task of the teacher with respect to assessment of learning outcomes varies across different types of PBL. Evidently, the Maastricht non-content expert facilitator cannot judge student-performance in anything but process skills. In order to resolve the problem that students tend to focus their attention on content they expect to be crucial in the examinations—thus limiting their freedom in self-directed learning—Maastricht did develop a progress test, an assessment method that is administered centrally and that is independent of the study programme [24]. In most other curricula teachers retain the responsibility to evaluate the learning outcomes of their own courses. For projects this tends to take the form of a project exam. In Denmark for some years the project exam has been banned by a government, which ruled that all exams at University must be based on an individual performance (after the next elections the ban has been lifted). Even so the project exam remains a complicated assessment instrument with serious issues regarding the measurement reliability.

### 3. Faculty development programmes and an outline for a PBL workshop

Traditionally there was no need for pedagogic qualification in order to teach in higher education. For a long time professional expertise and research performance were deemed sufficient to qualify as a professor. In the second half of the last century many universities in the North West of Europa, recognising the need for pedagogic training, established staff development centres. Usually, these centres offered pedagogic training on a voluntary basis, limiting the impact [25]. Since the beginning of the present century the attention for the role of staff development in ensuring the quality of teaching and learning increased markedly [26]. For instance, in the Netherlands all universities agreed to enhance training programmes for newly appointed teachers and to recognize results from each other’s staff development programme [28].

In order to be successful, a strategy to implement a faculty development programme should be part of a strategy. In a meta-analysis of various faculty development strategies Rege Colet distinguishes three basic Faculty development strategies [28]:

- A programme of courses and workshops offering teachers opportunities to improve themselves.

- A teacher training programme leading to a formal certification.
- Continued education of teachers as lifelong learners in a learning community

All three strategies presuppose an institutional culture where teaching activities are considered important. The long-term objective is to change the culture of teaching and learning.

Staff development is an essential aspect of educational innovation, in particular when a new pedagogic method is introduced, like when a traditional school introduces PBL. Self-directed collaboration in small groups is a core characteristic of PBL. Students are expected to run their own group-meetings and to plan their own study activities. Implementing PBL entails a process of organisational change. The allocation of responsibility for tasks like educational design and assessment of learning outcomes must be re-considered and the teaching staff should acquire new competencies. For the people involved, adjusting to the process of educational innovation implies a process of cultural change. For instance, the members of teaching staff need to learn share responsibilities across traditional discipline boundaries and to collaborate in interdisciplinary educational design teams, very much like the student study groups.

Over the past 25 years the author has conducted numerous workshops on PBL and facilitation skills in universities around the world. Often these workshops were part of an educational change strategy, the stage ranging from general orientation and

inspiration to concrete preparations for actual implementation. Sometimes workshops contain specific exercises aiming to enhance a change in defining your role as a teacher [29]. The facilitator needs to learn techniques allowing them to make interventions without disturbing the on-going process of self-directed learning, like: summarizing, mirroring behaviour; asking open-ended questions. The learning objectives and the most common elements of the training programme are represented in the overview in Table 1. Please bear in mind that it is only a rough estimate of the time needed. The programme can easily be tailored to suit particular local needs, like repeating some of the practice elements in order to give more people the opportunity to participate.

#### 4. A case study evaluation

Usually, at the end of each training programme some time is set aside for comments and question and reflection on the programme. In some cases there is also a more formal evaluation organised by the host institute. In most cases these evaluations are predominantly positive, even though there are almost always some participants with critical comments. Often such evaluations are based on a quantitative analysis, calculating an average and standard deviations of ratings on a Likert scale—a practice that is technically not allowed for this type of data, but condoned in social sciences research. The results of these quantitative evaluations may

**Table 1.** Components of PBL faculty development

Intended Learning Outcomes for PBL training programme: After following the course the participant will be able to . . .

- recognize the active components of PBL
- apply the basic principles of PBL tutoring (facilitation the learning process)
- be able to reflect on his/her own tutorial skills
- understand the implications of implementing PBL
- motivate when to apply which PBL variety

Components for a 2-4 days faculty development programme:

Topic	Comments	Time
<i>Interactive Plenary Presentations</i>		
PBL Models and pedagogic principles	Basic background information	60 m
Best practices PBL	Inspirational examples	60 m
Facilitation versus teaching	Teacher tasks in a PBL curriculum	45 m
Designing an environment for active learning	Course development	45 m
	Case construction	45 m
Management of change	How to organise the change process	60 m
Assessment and evaluation	A key to successful implementation	60 m
<i>Exercises</i>		
Introduction participants	Breaking the ice	30 m
Learning and teaching experiences	Your inner criterion for good teaching	60 m
Designing an environment for active learning	Course development	120 m
	Writing effective PBL Cases	120 m
Project work	Experiencing working in a project	180 m
Facilitation skills	Non-directive teaching	180 m
Project presentations and feedback	Assessing and being assessed	120 m
Strengths and weakness of PBL	Exchange of opinions and experience	90 m
Comments and Questions	Wrapping up	60 m

serve to give a general impression of the programme, but little more. Usually, the information is not specific enough to come up with improvements or adaptations.

The present study will use one particular workshop as an example to show what can be achieved with a combination of quantitative and qualitative data. The workshop with the title: 'PBL IN ENGINEERING EDUCATION: A PARADIGM SHIFT FROM TEACHING TO LEARNING' was organized on January 24 2014 at MAUA institute, Sao Paulo, Brazil. The workshop, facilitated by Erik de Graaff and Mona Dahms from Aalborg University, aimed to give an initial training in PBL (Problem Based Learning) skills to teachers from the MAUA institute. Following a general introduction on PBL, participants could choose on site from among the following topics:

- The role of the teacher in PBL
- Writing a project brief
- Assessment of project groups
- PBL curriculum design

There were just over 40 participants and all appeared to appreciate the workshop highly. Most certainly a good start was made in understanding PBL principles. See the evaluation scores in Table 2.

The data have been reported just as averages without further statistical analyses as there are not enough subjects to calculate a reliability index. However, it is clear these quantitative data tell only part of the story. How you experience a workshop depends at least partly on yourself. It really makes no sense to add up the ratings of 35 people who enjoyed the workshop with the score of one person who had a bad day. In the example above at first there was one person with extreme negative scores. However, it turned out this person had misinterpreted the scale, so the scores were adjusted before the final analyses. Still these data do not add much to the general impression that people were happy about the workshop. With the exception of

question 3, relating to the prior knowledge of the participants the differentiation between the questions is not big enough to draw specific conclusions.

For a more thorough evaluation, one would like to assess different aspects within the personal context of the persons involved, using open-ended questions or even interviews and observations. However, such an extensive evaluation takes much time. The alternative approach that was applied in this case, is an exercise labelled 'one-word impressions'. In the closing session of the workshop all participants are invited to reflect on the course with the following instruction: '*Please take a few moments to look back at the past day(s). Try and find one word to sum up your experience. You do not need to elaborate or explain this one word.*'

A selection of words that came up is presented below:

*'fantastic'; 'inspirational'; 'new ideas'; 'challenging'; 'insight'; 'so easy'; 'unexpected', 'surprising'; 'possibilities'; 'potential'; 'flabbergasted'; 'shocked'; 'disoriented'; 'difficult to do'; 'disappointed'; 'positive'; 'experience'; 'facilitation'; 'stepping back'; 'observation'; 'safety'; 'mirror'; 'problems'*

These words give a good impression of the kind of one-word statements that are made (a few actually need more than one word). Of course people like to explain their word choice afterwards. What stands out in these explanations is that people really only start to get a grasp of the concept of facilitation after being confronted with direct feedback in a groups exercise. For most teachers at the start it is inconceivable to do anything but to take the lead in the process. Even in role-play exercises where they do not have the necessary expertise, many teachers naturally assume a position of authority. The surprise comes when they get feedback from colleagues who tell them how they experience such a facilitator intervention.

Surprisingly, some people alter the connotation

**Table 2.** Evaluation IIDEA Workshop MAUA, 24-1-2014

Participants: 40	1. The role of the teacher in PBL—20	2. Writing a project brief—15		
Response: 35	3. Assessment of project groups—12	4. PBL curriculum design—16		
1. The objectives of the presentations were clearly stated			N= 35	4.8*
2. The sessions satisfied my expectations			33	4.5
3. I had previous knowledge of the topics			33	3.4
4. The content and organization of topics were satisfactory			35	4.6
5. The level and frequency of hands on activities were appropriate			35	4.4
6. Physical facilities were satisfactory			35	4.6
7. Supplemental information and tools for future use were provided			32	4.2
8. I gained useful knowledge that I will be able to apply			35	4.4
9. As a result of this workshop, I am more confident and motivated to initiate change at my institution			35	4.4
10. The workshop was a positive learning experience			35	4.8
<b>The overall quality of the sessions was excellent</b>			33	4.5

\* Scale: 1—strongly disagree; 5 strongly agree.

of their one-word evaluation with their explanation. For instance, someone explicated that the apparently negative word *'disappointed'* came to his mind because it was all so simple now that he saw how it came together. In general I would say that the workshop has been successful for as far as it has been possible to generate this general feeling of understanding and in particular the sense of a growing ability to make it work in practice.

## 5. Conclusion

Faculty development constitutes an integral part of educational innovation. At the very minimum workshops will serve to explain teaching staff what the innovation is about in terms of teaching behaviour. A more ambitious objective is to initiate a process of cultural change. It is difficult to answer conclusively the question to what extent such courses contribute to a change in educational culture. Of course the effectiveness will differ from one situation to the next. An evaluation that is only based on a simple questionnaire provides a general impression of the experiences of the participants. However, it is not possible to draw specific conclusions with respect to the components of the course. Also the general impression will be dominated by an overall sense of satisfaction/dissatisfaction. As can be seen in the reported case a positive feeling acts like a 'halo' resulting in positive averages on all aspects.

The overview generated by the 'one-word impressions' is highly subjective and by no means representative of all participants in a statistical sense. Still it generates a sense of the main trends in experiences at the end of the workshop. In particular because participants respond to other contributions and with the explanations afterwards added to complete the picture the impressionist understanding of the summing up is quite strong. If it is part of a faculty development strategy, it is important that there is a follow up on the evaluation.

What seems to be clear from the learning experiences quoted above is that course participants are more impressed by direct feedback on their own actions than by theoretical explanations of PBL concepts. Problem Based Learning requires a different type of interaction between teachers and students. Different in what way, depends on the type of PBL. In particular the role of a facilitator is difficult to learn for a teacher with extensive experience in a traditional curriculum. The facilitator is supposed to aim interventions primarily at the on-going process of self-directed learning. In project organised learning the facilitator needs to be a content expert, yet still the interventions should not obstruct the self-directed process. Acquiring

the skills of a facilitator involves a re-definition of the role of a teacher. The most important learning experiences reflect a rising awareness of the effects of your own interventions as a facilitator. The fact that in role-play exercises colleagues provide the feedback makes it even more effective. While essential for the implementation of PBL I would maintain that learning what it takes to become an effective facilitator adds value to any teacher in any type of curriculum.

Similarly, while regular training of teachers is essential in a PBL curriculum, no self-respecting institute of higher education can afford to continue without a faculty development plan these days.

Whether a strategy to implement PBL will be successful depends on many different factors. Yet, it is beyond a doubt that courses to train faculty in PBL skills are an essential part of the implementation of PBL and the most crucial effect of such a course is to raise the awareness of the teachers enabling them to change their perception of their own role in relation to the student's learning process.

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