Constraints Affecting the Implementation of problem-based learning (PBL) Strategy in University Courses

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ABSTRACT

The aim of this study was to obtain insight into the effect of quality assurance system on the implementation of PBL teaching strategy to courses in three universities of Hong Kong. A total of nine research teams (each consisting of a few PBL-tutors) were involved. Before the implementation of PBL, the tutors attended specific orientation and training sessions on PBL. Twenty-one tutors were randomly selected for interview after the implementation. The results of the study indicate that the quality assurance system within most institutions does affect the implementation of PBL. The reliance of research output and a standardized student feedback questionnaire as indicators of staff performance do have a detrimental effect on the implementation of PBL. On the other hand, resources and class size also have a direct effect on the willingness of academic staff to adopt the PBL approach in teaching. Finally, student factor also plays an important role in the successful implementation of PBL. To implement PBL successfully, PBL tutors need to be supported by a clear message from the university quality assurance system that this is the way to go forward. Without taking this seriously into consideration, one could predict serious difficulties in promoting PBL in the education sector.

INTRODUCTION

Problem-based learning (PBL), perfectly in keeping with contemporary constructivist views of education, is an instructional method that uses real world cases or problems as vehicles for students to acquire critical thinking and problem-solving skills. In problem-based learning, new knowledge is acquired in the context of some meaningful problems or situation. Students actively engage with the cases and build their own understanding under the guidance of the instructor, but the instructor does not do the building for the students.
PBL was first introduced for use in medical faculties (McMaster’s medical school was one of the pioneers). It solves some of the important problems of medical education such as difficulties encountered by students to practise the knowledge gained in a clinical setting, the lack of integration of the knowledge acquired in the different disciplines (Barrows & Tamblyn, 1980).

Much previous research has associated problem-based learning with optimal learning performance, particularly in the area of knowledge retention [see review by Norman & Schmidt (1992)]; integration of basic science knowledge into the solutions of clinical problems (Barrow, 1985; Norman & Schmidt, 1992); self-directed learning skills (Barrow & Tamblyn, 1980; Glaser, 1991; Blumberg & Michael, 1992), and increased intrinsic interest in subject matter (Barrows & Tamblyn, 1980; Schmidt, 1983).

The philosophy of PBL highlights exploratory, constructivist approach to teaching. Teachers or tutors using this approach should hold a student-centered/learning-oriented conception of teaching where teaching is viewed as a means to facilitating understanding and conceptual change/intellectual development (Kember, 1998). However, it has been a major concern that quality assurance system and other infrastructures within an institution might contradict the nature of teaching fostered by PBL. The focus of this paper is to investigate the different constraints within a teaching environment, which affect the implementation of PBL strategy in university courses.

**METHOD**

**Context of the Study**

The University Grants Committee of Hong Kong allocated a research grant to local tertiary institutions for carrying out a PBL-based project. Participants in the project have been encouraging the introduction of PBL in a wide variety of health science disciplines in the University of Hong Kong, The Hong Kong Polytechnic University and the Chinese University of Hong Kong. This involves a total of nine sub-project teams with a total of approximate 30 PBL tutors.

A meta-project was conducted to evaluate the effect of implementation of problem-based learning on the change in teaching orientations of tertiary teachers, focusing on their espoused belief and belief-in-use in PBL. Data were collected from semi-structured interviews with all health science faculty members who participated in sub-projects, and tutors who are involved in actually running the tutorial groups. The interview aims to identify the teaching orientation of the participants, any problems encountered during the implementation of PBL, and the participants’ evaluation of the effectiveness of the main PBL project (i.e., enhancement of teaching and learning).

This paper focuses on reporting the findings related to the tutors’ perceptions of the constraints affecting the implementation of PBL strategies.
RESULTS AND DISCUSSION

In general, most tutors who participated in this project identified constraints such as the university reward system, teaching evaluation mechanism, resource allocation and students’ responses to PBL.

University Reward System

At the university level, the reward system has a direct effect on tutors' willingness to spend time on devising their courses in the PBL mode. Most universities award staff (in terms of promotion and contract renewal) based on their research output. Staff has to produce certain number of refereed research papers to meet the requirement. They have to engage themselves in research in order to have substantial output. Very often, research in health sciences requires laboratory work, data analysis, and write-up, which are time consuming. The following interview excerpts illustrate such concerns.

"…your performance is measured very much by your research output actually… At the end of the day, it is research assessment. How many paper you had published. They are not going to care How many PBL tutorials you have done. They want to know why you haven't published more paper or whatever…"

"…it is essential to know how the university rates between research and teaching… it doesn't worth if the university doesn't recognise it."

Teaching Evaluation Mechanism

In many universities, student feedback on teaching constitutes one of the major elements of the quality assurance system, and teaching is evaluated by a standardized student feedback questionnaire. Though the items of the questionnaire do vary from institution to institution, in most cases, these items are designed to evaluate traditional teaching methods. In this respect, these items are not tailor-made to take care of any innovative teaching methods such as problem-based learning. In the end, most tutors who used problem-based learning were invalidly rated low by the students using an inappropriate instrument. These low ratings would have a very detrimental effect on tutors to continue adopting the PBL method as illustrated by the following comment.

"…a big challenge… the student would complain (about you). We are facing great pressure in the evaluation stage or the student feedback stage. If all or most of the feedback is negative, our contract would be terminated by the boss."

Since most items in the traditional instrument only evaluate effectiveness of teaching within a traditional classroom environment, there is a strong need to develop a new evaluation instrument to address the specific features of problem-based learning. This need was implicated by the following comments.
"...most of our colleagues knew that the result of the feedback would be low. The effort of the teacher has not been granted a fair reflection. As there is no other quality assurance instrument which is more friendly to PBL, we have to face negative outcomes."

"The things that those forms assess do not show up in PBL. I think it might not be a very suitable quality assurance method for PBL and for all other subjects."

**Resource Allocation**

To promote problem-based learning, resource is a very important calibre. With the exception of the Medical Faculty at the University of Hong Kong, problem-based learning is not being implemented on a faculty or departmental basis in most local universities. In most cases, PBL is only implemented in isolated subjects/units within the particular programmes. In this interim period, physical and human resources allocated to departments are inadequate to promote and support a complete change to PBL. Under this resource constraint, staff finds it especially difficult to implement problem-based learning to its full scale. The following excerpts show some of the difficulties:

**Human Resource**

"...they did not give any support in human resources, for instance, the support of facilitator or tutor."

"Some tutorials can be led by postgraduate students. However, all our team members do not have full-time postgraduate students... We are exhausted indeed."

**Physical Resource**

"It is more resource intensive... students go to the library and use computers. Often you need to have case information or the video of the client that you use for the problem. So you need to have more resources to make it work.... You need a lot of smaller rooms so you can run the tutorial groups."

Insufficient human and physical resources indefinitely affect group size of the problem-based learning classes. An increase in group size beyond the ideal will create problems for teaching and learning. The following excerpts illustrate the difficulties encountered:

"...if the group is too large, it is impossible to conduct discussion. Four of us...actually, each of us had twenty something students. We had to divide the group into more smaller groups to make sure that every student could participate in the discussion."

"Each group has about thirty students...the problem is very difficult
to get the staff to teach the things. You know, it is very labour intensive...."

**Students’ responses to PBL**

Any successful innovative teaching methodology has to be supported by positive students’ responses. One issue about the Hong Kong education system is the focus on rote learning at the school level. The over-emphasis on examinations drives teachers and students to adopt the transmissive mode of teaching and the receptive mode of learning. Students, immersed in this passive teaching and learning environment, are resistant to more active and independent mode of learning. The following interview excerpts explicitly point out that problem-based learning is completely different from their previous learning experience:

"Time is also limited. They would like to have more lectures because they did not know how to do it (solve the problem)."

"….not sure what they could learn from the given problem… also not sure how much and how deep they have to learn."

"….students were very frustrated at the beginning…. Not sure what is PBL. The PBL approach does not "tell" them anything. They have to find the most suitable way (to solve the problem). This kind of uncertainty is not only unfamiliar but also unbearable to students receiving traditional education in Hong Kong."

This resistance form students was intensified in situations where these students are exposed to isolated experience of problem-based learning (in one or two courses) but are required to learn passively in most other courses. The interview excerpts reflect these students' problems in the eyes of the lecturers:

"….would compare the PBL course with others as our teaching method is different from others and the demand for students is higher… complain that our demand is too high, the presentation is not marked."

"….it takes the students more time… you have to spend a lot of time going to the library, getting the resources. And also … working with other students, you actually spend a lot of time talking to your classmates in the group in tutorial. That includes like phone calls…, and meeting in the evening, or email, chat group. So it actually takes a lot more time and coordination."

"….not used to the idea of going to literature so it is hard for them the first time they do it…. it is the process they have to learn."
CONCLUSION

The present data show the various constraints existing in most institutions are adversely affecting the implementation of PBL. At the university level, the emphasis on research output as an evaluative measure of staff performance provides a much stronger incentive for academic staff to utilize their time in research than to engage in implementing PBL strategies.

Furthermore, teaching quality is unfortunately measured, in most universities, by a standardized questionnaire, which does not address PBL. The teaching quality of most PBL tutors is, therefore, rated low by this instrument. This low rating has a discouraging effect on staff spirit, and creates a gap between their espoused belief of teaching and their belief-in-practice. Most staff indicate that they dare not "sacrifice" their job for PBL unless their performance could be validly evaluated by an appropriate instrument.

Resources and class size also have an effect on the successful implementation of PBL. Currently most local tertiary institutions in Hong Kong, except the University of Hong Kong, consider PBL as only one of the teaching methods. Under these circumstances, resources, both physical and human, are not appropriately allocated for the adoption of PBL at course level. PBL tutors find it especially difficult to implement this teaching methodology without extra support.

Finally, many tutors in the study perceived negative student responses towards PBL. Since PBL is only introduced in a few isolated subjects, students are still exposed to traditional teaching methods in other non-PBL subjects of the same course. As a consequence, comparison of workload among different courses would create negative feelings, as PBL courses usually demand greater workload and more independent learning. These negative feelings are intensified by the fact that most students come from a traditional teacher dependent teaching and learning environment in their secondary school training.

To implement PBL successfully, appropriate and adequate support by the university is of vital importance. Instead of allowing PBL to be considered as only one of the teaching methods, university administrators need to explicitly recognize and adequately support PBL as the teaching and learning approach to be adopted. Policy decisions and implementation including appraisal and resource allocation need to be reviewed and revised to effect such recognition and support. This change should apply to all levels to ensure that philosophies and policies of teaching and assessment are geared towards a more student-centred approach. Without taking this seriously into consideration, it would be difficult for PBL to be adopted as the appropriate approach in education at all levels.

ACKNOWLEDGEMENT

This project was made possible by a teaching development grant funded by the Hong Kong University Grants Committee.
REFERENCES


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TEHE Ref: R88