Experience of Using Problem-based Approach in an Early Childhood Teacher Education Module

To Chan Sing-pui, Tikky
Lecturer, School of Early Childhood Education

Have you ever seen solutions to problems being arrived at and knowledge being created through group problem solving? Successful problem-based learning groups found that they discovered new knowledge by answering their own questions. In one of my recent problem-based learning classes, a group of students sought my advice on their work in tackling their set question at an early stage of study. They asked me whether there was a difference between 'emergent curriculum' (萌發式課程) and 'open curriculum' (開放式課程). They anticipated an answer from me so that they could progress with their work. This was the practice they were used to in the process of learning. In response, I initiated the students to present their collected information on these two kinds of curriculum. The group of students, one by one, started to explain what they understood about the information. They compared and contrasted the characteristics of the curricular components. It was in this probing process that the students were aware that they exercised their right to interpret and transform knowledge for their own use. They experienced the process of creating a group’s view to the information extracted from books, using collected information to support their view, transforming the borrowed information to new knowledge and also “owning” the new knowledge. Students came up with their own solutions without my imposition of knowledge upon them. This was a scene where I observed students who exhibited the joy of learning.

What contributes to this scene? Trying to understand the phenomenon and the problem-based approach, I draw upon the underpinnings of problem-based learning, and addressed the following two questions. First, what is the rationale underlying the design of problem-based learning? Second, what are the potentials of problem-based learning?

Rationale of Problem-based Learning and Key Elements of the Module Design

Based on the belief that there are differing ways playing out problem-based learning in an educational setting, an adapted form of problem-based learning was first tried out in one module design in the In-service Certificate Course of Teacher Education for Early Childhood Educator (CE-KG) in 1997–1999. Based on the results of the module evaluation study (Lui and To, 1999), some organizational elements were modified, and the revised form was implemented in the CE-KG 1998–2000. The key elements constituting the revised module were described in light of the rationale of problem-based learning as follows.

The Use of Problem

“... the starting point for learning should be a problem, a query or a puzzle that the learner wishes to solve.” (Boud, 1985)

Problems are used because they simulate real-life situations. “Learning from problems is a condition of human existence” (Barrow and Tamblyn, 1980). In this module, a problem scenario was used as stimulus material to help students discuss problems or issues. The problem scenario was a simulated scenario of a real situation at school. It was deliberately written for initiating students to discuss problematic areas regarding curriculum development. The problem enabled learning as an outcome of working toward the solution of the problem. The problem also enabled the process of constructing knowledge through understanding the problem. The problem situation put learning in context and resulted in providing the learner with a purpose for the current learning activity as well as providing meanings for future application in school.

The Use of Self-directed Learning

“Skills of self-assessment and self-directed learning allow the student to become sensitive to personal learning needs and to locate and to use properly appropriate information resources.” (Barrows, 1986)

Students are viewed as active learners, problem solvers, and capable of making decisions for their own learning. They are given the opportunity to make decision on the learning objectives and learning materials. Students are motivated to learn when they assume responsibility for their learning. Self-directed learning was employed in this module design. On receiving the problem scenario, students would define the problematic areas, and formulate specific questions according to their interests and needs. To pursue solutions to the self-determined question, students devised an action plan to collect and analyze information. Students continually refined their questions and plans in meeting their needs. Students benefited from being motivated to learn. Students owned both the learning process and the learning outcome. The load and challenge of being responsible for making decisions on what and how to learn brought about learning excitement and enthusiasm to students.

The Use of Small Group Learning

“From a learning viewpoint, all research points to the advantage of the small group, PBL format.” (Woods, 1994)

The assets of small group learning are valued in problem-based learning. According to Wood (1994), learners actively involved in a group foster learning and this is recognized in the problem-based approach. Students also learn more and better when they actively and cooperatively participate in learning. Teamwork that risks conflicts arising from members’ differences is highly valued.
In this module, teams were organized around five to six students. In order to promote effective group dynamics, students were asked to assign a chairperson, and a recorder. Students were also reminded to share out time to present one's own views and responses to others. The potential benefits of working in a team are interpersonal skills, communication skills and team building skills. Personal skills such as coping with conflicts, respecting others' views, cultivating trust, and managing time effectively, are also considered as the profits embedded in the process of learning.

The View and the Form of Learning
“For the student, problem-based learning emphasizes the application of knowledge and skills to the solution of problems rather than the recall of facts.” (Bligh, 1995)

The underlying assumption of this view to problem-based learning is in accordance to the fundamental postulate — learning through problem solving is much more effective than memory-based learning (Barrows and Tamblyn, 1980). To realize the view of using problems to drive effective learning for the acquisition of knowledge and skills, the following flow chart described the sequence of activities employed in the module design:

Orientating students to problem-based learning

↓

Problem scenario one: all learning concepts embedded (Brainstorm problematic areas; activate prior knowledge)

↓

Problem scenario two: fundamental concepts embedded (Define problems)

↓

Formulate specific question according to group's interest (Generate hypotheses)

↓

Devise action plan for problem solving

↓

Collect information (Involvement with new knowledge)

↓

Share information and discuss (Refine, and verify hypotheses)

↓

Review the plan

↓

Continual of collecting, and discussing information (Analysis, syntheses and evaluation)

↓

Draw up solution to the problem (Apply new knowledge)

↓

Present the solution

↓

Reflect and write on the experiences (Relate to personal context)

The entire sequence of activities lasted about twelve weeks, in which students were provided with contact hours for eight sessions. Each problem-based learning session was comprised of an hour to one and a half hour. There were six groups of students in a class and one tutor was responsible for facilitating discussion. Both tutor-led and student-led discussions were conducted in the problem-based sessions. Mode of lecture-based learning was also adopted in this module, providing complementary information on the fundamental concepts to students.

The Potential of Using Problem-based Learning in the Module

The module aimed at facilitating students to synthesize curriculum theories with knowledge of child development and learning, and explore ways of enacting theories in practice. In achieving the module aim, the features of problem-based approach were incorporated into the module design, and the potential of the problem-based approach was recognized as follows:

<table>
<thead>
<tr>
<th>Potential of PBL: Acquisition of a set of professional skills</th>
<th>Features of the problem-based approach in CE-KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasoning</td>
<td>Students are required to identify the problematic curriculum areas, formulate specific questions, generate hypotheses of the scenario, draw upon relevant information for understanding the problematic areas, and analyze the data collected.</td>
</tr>
<tr>
<td>Integrated Learning</td>
<td>Information is retrieved and assembled from various domains, including child knowledge, learning theories, curriculum theories, and the real context. The interrelationship among concepts is explored.</td>
</tr>
<tr>
<td>Self-directed Learning</td>
<td>Problem scenario is used to stimulate students to formulate specific questions to pursue for solutions. Students assume responsibilities of identifying their needs, collecting relevant materials and planning for the working schedule in achieving solutions for the problem.</td>
</tr>
<tr>
<td>Group Decision-making</td>
<td>Through group discussion, students present information collected, explain views, respond to others, discuss propositions, and draw up conclusions.</td>
</tr>
</tbody>
</table>

It had been identified that the potential of acquiring a set of professional skills was inherent in the problem-based activities. Learning with a focus on a problem added considerable benefits to students' development in reasoning skills, study skills, group skills, and personal skills, apart from broadening knowledge. Most of all, the learning approach enabled students to perceive the relevance of knowledge for their future use.

Learning from the Experience

Reflecting on the theoretical perspective of problem-based learning in relation to the implementation and evaluation
of module teaching, two variables were prioritized for considerable attention in the further development of incorporating problem-based learning into the module design.

The first variable was the problem design. The design of the simulated scenario was determined by the set of learning objectives or the set of fundamental concepts to be grasped in the module prescribed beforehand. From the real practice, it was identified that conflicts arisen were centered on the following themes:

- Coverage of concepts in a problem;
- Structuring of problems;
- Amount of problems;
- Priority of problems, and
- Scheduling of time.

Another variable of supreme importance was the degree of student-directed learning. Factors affecting curriculum decision-making in this regard included:

- Desired aims and objectives;
- Tutor’s facilitating skills;
- Form of problem;
- Assessment method;
- Availability of time; and
- Availability of resources.

Taking into account the two variables, the challenges ahead requires sustained efforts to modify on the form of problem-based approach in providing a supportive environment to realize the conception of learning. From the trial experience of developing and implementing the problem-based approach, I consider it is important to maintain confidence in the potential of the approach in order to maximize the benefits. If lifelong learning encompasses “enjoying learning” and “learning how to learn”, problem-based approach is promising in satisfying teachers’ learning needs as well as the development of learning skills. In educational setting, there are no definite answers to educational problems, but teachers have ongoing classroom decisions to make. The virtues of using problems in learning hold the potential of developing teachers to identify, analyze, evaluate and derive resolutions to educational problems.

Acknowledgements

I acknowledge the contribution of Mrs. Eva Lui to the problem-based module design and teaching and, Miss Christina Ching and Miss Sharon Ng, to the problem-based module teaching.

References


