

Problems and Corresponding Solutions of PBL Teaching in Primary and Secondary Schools in China

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Abstract: Language-based-learning is learner-centered learning generated in the process of understanding and solving problems. It is a very popular instructional method in western school education, especially in western higher education in the second half of the 20th century. However, PBL was introduced into China relatively late and is rarely used in teaching, so there are still plenty of problems on how to design a lesson based on PBL to realize the advantages of PBL in teaching. This study will analyze the elements needed, the existing problems and improvement plans in the application of PBL in Chinese middle school teaching. The major findings of the study were: 1) Problems existing in the application of PBL teaching in Primary and secondary schools in China; 2) Ways to solve these problems. The contribution was to help PBL teaching be better applied in Chinese primary and secondary school classrooms, and to improve the teaching methods of Chinese primary and secondary school classrooms. In addition, PBL teaching can give full play to the teaching effect in Chinese primary and secondary schools and improve the efficiency of teaching.

Keywords: PBL teaching, primary and secondary school education, teaching method, China, teaching application.

1. Introduction

PBL was first applied in medical teaching in McMaster University of Canada in 1969 by Barrows, a professor of neurology in the United States [1]. Then it has been adopted by many colleges and universities and has become a popular teaching method in the world [2]. Its advantages are widely recognized, including stimulating students' interest in learning, cultivating students' team spirit, improving students' ability to solve problems by themselves and so on.

After PBL was introduced into China, studies on the definition and advantages of PBL, even the influence of teachers' abilities on the teaching effect of PBL emerged one after another. However, there are much fewer studies about the teaching practice of PBL which have a leading effect on teachers' PBL teaching.

This study will analyze the challenges in PBL implementation in Chinese middle school teaching, and give suggestions on the improvement of the practice of PBL in Chinese middle school teaching.

2. Advantages of PBL Teaching Method

2.1. Stimulate Students' Interest in Learning and Improve their Independent Learning Ability

In traditional teaching in China, teachers play a leading role in teaching and systematically impart knowledge to students, while students are passive receivers of knowledge. Such teaching mode tends to lead to insufficient interest and motivation of students in learning. In the long run, students will be used to passively accepting knowledge rather than actively exploring knowledge, resulting in poor independent learning ability. Constructivism holds that human cognition is the "construction" process of the subject, and the subject understands the cognitive object by virtue of his own experience. Learning is a process of students' active cognition and it is based on specific situations. With the help of teachers, parents and classmates, students process external cognitive objects to form their own opinions and construct "schemas" in their minds. It is not just a process in which teachers simply teach knowledge and students passively accept it [3]. PBL's teaching mode is based on certain problems, enabling students to recognize problems and solve them independently under the guidance of teachers. In the process of solving problems, students are able to think independently and cooperate with their partners, so as to improve their independent learning ability in the process of thinking and solving problems.

2.2. Enable Students to Grasp Knowledge more Firmly and Develop Students' Cognitive Strategies

According to Merlin C. Wittrock, the main purpose of teaching activities is not only to stimulate students' learning motivation, but also to promote students to actively connect the old knowledge with the new knowledge in the original cognitive structure, so as to develop students' cognitive strategies to a certain extent. PBL teaching is student-centered. Students are the center of PBL, the participants, designers, manipulators, organizers and self-feedback evaluators of problem solving. In PBL teaching, teachers first present problems to students at the "intersection of old and new knowledge", stimulate students' strong cognitive conflicts and desire to solve problems, and then guide students to explore purposefully. By actively defining the problem domain, analyzing the origin of the problem, formulating feasible strategies, implementing solutions, summarizing and obtaining conclusions, reflecting and evaluating, students establish a link between new and old knowledge, and experience the process of knowledge generation and internalization into energy through activities such as moving hands and brains [4]. In this way, students can improve their learning ability and develop cognitive strategies in the process of discovering, recognizing and solving problems.

2.3. Cultivate the Talents that Society Really Needs

PBL teaching not only advocates students' independent learning, but also encourages group learning. In the process of group learning, students' teamwork spirit and ability will be greatly improved. Compared with traditional Chinese education, students trained by PBL teaching method can better meet the requirements of the new era for talents, that is, to give full play to their individual abilities in a team.

3. The Problems Exist in PBL Teaching in Chinese Middle School

3.1. Teachers' Understanding of PBL is not Deep Enough

With the gradual implementation of the new curriculum in China, the theory has gradually gained the attention and recognition of Chinese people, and some schools and teachers began to try to use PBL mode in teaching. However, due to the lack of experience, some teachers lack in-depth understanding

of PBL project-based learning and lack of grasp of the key links in the transformation process of the current learning mode, resulting in unsatisfactory classroom effects.

3.1.1. Specific Performance

Unclear teaching objectives: Since PBL teaching has not been introduced into primary and secondary education in China for a long time, many teachers cannot set up authentic questions and reasonable teaching objectives when conducting PBL teaching. The lack of problems suitable for PBL teaching means that the teaching activities cannot fundamentally achieve the teaching objectives, which will lead to the PBL classroom to be time-consuming but ineffective.

The teaching process becomes a formality: Many teachers at the time of initial contact with PBL teaching method, is very easy to fall into formalism and pursuit the form, failing to realize the essence of the PBL teaching (problematic, situational, autonomy, the zetetic, cooperative, diversity of reflective and evaluation) [5]. This would probably make teachers ignore the realization of teaching goal, and fail to achieve the expected teaching effect.

Teachers cannot adapt to PBL teaching method in the short term: Chinese teachers master teaching methods in the traditional training mode and are familiar with the mode of "teacher imparts and student accepts", and there is a process of psychological adaptation to the mode of "students as the main promoter of teaching activities and teachers as the assistant of students" [6]. Therefore, there is still a long way for teachers to go from knowing PBL teaching method to being proficient in using it and to change from the traditional teaching center and the source of knowledge to the planner, guide and assistant for students to acquire knowledge [5].

3.2. Lack of Relevant Technical Resources

In order to ensure the teaching effect, it needs a large number of resources in PBL teaching process, such as sufficient library collections, a large number of literature databases, appropriate textbooks, specialized classrooms, teaching AIDS and other hardware facilities, which are the guarantee of students' learning attitude and learning effect [7]. In addition, digital media such as electronic books, electronic materials, audio and video media, and interactive technological means such as collaboration platform, communication software and inquiry software are also important information means [8]. However, in many primary and secondary schools in China, these hardware facilities are not fully equipped, which will become an objective factor hinders PBL teaching.

3.3. Lack of Systematic Theoretical Guidance

PBL has changed the knowledge system and structure of traditional teaching. In order to implement the new curriculum system and teaching objectives, a complete and feasible teaching idea is needed [9]. Without systematic theoretical guidance, the implementation of PBL in primary and secondary schools will lack the guidance of teaching ideas, and it is very likely that teachers can hardly control the classroom and the teaching effect cannot reach the expected situation.

3.4. The Teaching Evaluation System Matching PBL Teaching Reform has not been Formed Yet

The teaching assessment system and evaluation standard must be matched with the teaching method to make a correct evaluation of the teaching effect. PBL is a teaching method that integrates teaching process and results. Whether PBL teaching reform can be carried out smoothly depends on the teaching evaluation system, especially the examination and evaluation system [10]. At present, Chinese college students' performance assessment is still based on paper results. However, PBL

teaching method focuses on the improvement of students' thinking, the cultivation of team spirit and the training of problem solving ability, and lacks systematic knowledge learning. As a result, a student may improve the depth of thinking and the ability to solve problems in PBL teaching class, but his paper score does not improve. This is likely to lead to students' rejection of PBL teaching method, which is not conducive to the implementation of PBL teaching method in university classrooms. Therefore, how to solve the conflict between PBL teaching method and current examinee assessment standard will become a key element to solve PBL teaching in middle school classroom.

4. Suggestions on the Application of PBL Teaching Method in Chinese Primary and Secondary Education

4.1. Conduct Training on PBL Teaching Method for Teachers

At present, most primary and secondary school teachers in China have not received professional training in PBL teaching, and the teaching methods they use are still the traditional teacher-dominated teaching mode. In order to carry out PBL teaching method in higher education, it is necessary to train teachers to have a deeper understanding of PBL teaching, and train teachers to transform from the traditional teaching center and source of knowledge into planners, guides and assistants to help students acquire knowledge [5].

4.2. Provide Relevant Technical Resources

PBL teaching process needs all kinds of hardware and software facilities. PBL project-based learning emphasizes the diversity of students' learning results and the use of new media and technology to creatively produce new programs and works based on the knowledge and content learned, which is to highlight students' creative expression [8]. In addition, the lack of relevant technical resources is also one of the main reasons why PBL teaching fails to prevail in primary and secondary schools, so it needs strong financial support and investment from schools.

4.3. Research and Implement a Systematic Curriculum System of PBL Teaching Method

Since PBL teaching method has not been introduced in China for a long time and the traditional teaching mode has been implemented in China for a long time, PBL teaching has not formed a system in China [9]. The prerequisite for the long-term, effective and systematic implementation of PBL teaching method in primary and secondary schools is a complete curriculum system of PBL teaching method. In order to meet such requirements, it is necessary for the education department to study and implement a program suitable for PBL teaching method in China according to the current situation of education in China [11] [12].

4.4. Develop the Corresponding Evaluation System for PBL Teaching

One of the reasons why PBL teaching method is not popular in domestic primary and secondary schools is that the current school evaluation system fails to match PBL teaching mode. As a result, many students and even teachers think that PBL teaching cannot be adapted. Therefore, it is of great significance to develop an evaluation system matching PBL teaching mode for the promotion of PBL teaching method in primary and secondary schools.

5. Conclusion

In view of the high efficiency of PBL teaching method and its inpopularity in Chinese middle school, the problems exist in PBL teaching in Chinese middle school and the feasible methods to improve

the effects of PBL teaching in Chinese middle school are analyzed in this study. And the study is aimed to provide some solutions to help PBL teaching be better used in primary and middle school classrooms in China, and improve the efficiency of teaching.

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