

The Application of the PBL Teaching Model in Chinese Primary School

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ABSTRACT

With the continuous curriculum reform, the traditional education model has gradually failed to meet the requirements of the new curriculum. The new curriculum model has a new definition of the diversity of curriculum, teachers' roles and learning methods. For better meeting the requirements of the curriculum reform, this paper proposes the PBL (Problem Based Learning) course teaching model, which requires teachers to play the role of facilitator and helper in the teaching process. Teachers should pay more attention to students' cooperative explorations and independent research. Therefore, the PBL teaching model is in line with the requirements of the new curriculum reform. This paper use literature reviews as methods. Two examples of PBL teaching model in primary school English and mathematics teaching are listed. Students' motivation, initiatives, understandings of knowledge, and ways of thinking are found to be greatly improved when they accept the PBL teaching model. This paper also compares the differences between traditional education and PBL teaching model from several perspectives, such as the role of the teacher, and the way of problem solving. To better use the PBL teaching model in primary schools, teachers play a crucial role. Therefore, teachers need to pay special attention to the arrangement of questions, cooperative inquiry, and skills.

Keywords: PBL, Curriculum Reform, Primary School, Teaching Mode.

1. INTRODUCTION

Used extensively in medical education since the 1970s. PBL is an instructional approach that teaches students "how to learn" by collaboratively solving authentic industry problems. With the development of constructivism in the world, the PBL teaching mode has attracted many attentions to the field of education. However, PBL project-based learning stimulates learners' explorations, interests and initiatives. It is appropriate to carry out PBL learning for primary school students. Nowadays, primary school students prefer interesting learning mode, which can motivate their learning interests. If the PBL teaching mode is widely implemented, it can not only train the scientific thinking ability of primary school students but also help learners to understand and master the knowledge and establish a good platform for higher education in the future.

2. THE DEFINITION OF PBL

PBL is a problem-oriented and student-centred approach to teaching and learning. It was first introduced at McMaster University of United States in 1969. It has become one of the most popular learning methods internationally, particularly in western countries such as U.S. and U.K. [1]. PBL aims to gain problem-solving and self-development skills when students are learning to solve problems cooperatively [1]. On top of this, students can acquire the scientific and systematic knowledge behind the problems [1].

3. PBL AND CURRICULUM REFORM

Zhang refers that with the development of education, the traditional teaching, mainly based on the indoctrination of knowledge, has become more and more incompatible with the current curriculum reform and the change of education mode [2][3]. The new curriculum reform not only requires teachers to change

the goal of education, but it also proposes new requirements for the cultivation modes. The problem-based learning method can stimulate students' senses of innovation, which can also cultivate students' independent thinking ability, and improve students' ability to discover, analyze and solve problems simultaneously. Finally, students' core literacy can get well-developed. This teaching model is consistent with the concept of curriculum reform.

4. THE APPLICATION OF PBL TO PRIMARY SCHOOL

4.1 The Application in English

The application of PBL in English teaching in primary school requires students to work in groups to interact, communicate, present, evaluate and summarize. This mode allows students to build their English knowledge network, master English knowledge, and improve their English expression skills when they are making projects [3]. The outline of China's basic education has pointed out that traditional teaching should be reformed, especially transferring the wrong concept of knowledge [3]. It should be changed into a positive and active learning way [3]. Students should learn to master relevant knowledge, and gradually develop correct learning concepts. Fortunately, the PBL teaching mode can satisfy most of the above requirements. Hence, it is significant for us to apply this model in English teaching in primary schools.

To explore the application of the PBL model to practical teaching, Gu collected data from the Unit 1 Cinderella in the book of Grade 5 of Sujiao edition published in Yilin publisher [4]. He holds the view that creating a good learning project is the prerequisite to ensuring the effectiveness of the PBL teaching mode [4]. Therefore, teachers need to have a thorough understanding of the material, sort out the topics and content. In addition, teachers considered the topic which was connected with our daily life. Below is the possess of research from Gu:

"The text was determined to present in the form of a script, hence it required students to master and understand the text. After the assignment of the learning project, the teacher separated the students and let them explore in groups. Every group had four students. And they could freely form groups according to their wishes. After the groups are formed, the teacher chose a student who had strong organizational skills as the group leader. Hence, this student managed the cooperative learning process. Since primary school students were not physically and psychologically mature and lacked teamwork skills, the group leader could play a leading and coordinating role in their group. After this, the group members started discussing how they should present their group's play and divided the work among

each member. Finally, they presented their final work in class."

In this case, all the problems could be discussed and solved together during the class, but when students met a problem that cannot be solved, they could also ask their teacher for help. The teacher paid attention to the whole process and offered his modifications at the appropriate time. At the end of the class, students responded that they were impressed with the text. I suppose that students not only mastered the ability to read and understood the English story but also did a certain amount of English reading under the guidance of the teacher. The whole class was very interesting. With the help of the PBL teaching model, students can communicate with their teachers and classmates to explore the mysteries of English learning together. This helps students to learn English with self-confidence and achieve progress [4].

4.2 The Application in Mathematics

The application of mathematics aims to familiarize students with the material and to build a solid foundation for future learning [5]. Students discuss the problems and solutions in the group by their research. Group work allows students to learn more ways of solving problems and help them improve their logic. In addition, group work can foster students' thinking ability as well. To explore the application of the PBL model in practical teaching, Zhang conducts research as well. Below is another example from Zhang:

In this case, the teacher came up with the topic "the relationship of three chopsticks" to attract students' attention. After that, the teacher guided students to imagine the shape of a triangle with three chopsticks. Then, the teacher led students to recall the characteristics of a triangle. Finally, a teacher asked, "Can you make a triangle with three chopsticks?" The teacher gave the students three sets of chopsticks, two chopsticks per set (one is a red chopstick, and another is a silver chopstick.)

"Group 1: The length of the red chopsticks is less than the length of the silver chopsticks.

Group 2: The length of the red chopsticks is the same as the length of the silver chopsticks.

Group 3: The length of the red chopsticks is longer than the length of the silver chopsticks."

At this point, the teacher suggested that only one set of chopsticks could be chosen. Students should cut red chopsticks into two pieces, and then they could get two red and one silver chopsticks. Students started to use them to form a triangle. Students considered themselves which set of chopsticks to choose. After that, every three students organized a group and began to research.

After the students had completed their work, the

teacher chose three representative results to show and explain:

“Group 1: The red chopsticks are larger than the silver chopsticks and form a triangle.

Group 2: The red chopsticks are equal to the silver chopsticks and do not form a triangle.

Group 3: the red chopsticks are smaller than the silver chopsticks and do not form a triangle.”

Through the presentation of these three groups of materials, students naturally understood the conclusion that "the sum of the two sides of a triangle must be longer than the third side". After the students understood this conclusion, the teacher asked each student to practice drawing the triangle and then compare the relationship of the sides and record it.

In short, PBL is used throughout the teaching to stimulate students' desire to learn independently by setting and answering questions. Students' desire for independent learning is stimulated by setting and answering questions. Students should play the main role in teaching and learning when utilizing PBL, so that they can explore and solve problems actively to improve their learning capability [5].

5. THE EVALUATION OF PBL IN PRIMARY SCHOOL

Through the application of PBL in both primary English and mathematics, we can find out that this teaching mode can stimulate students' enthusiasm for learning. No matter which genre or subject it is, it is possible to become a fascinating way to stimulate children's interest in learning. The teacher's assistance can ensure that students can carry out the activities correctly and efficiently; each student in the group can fully play the role of the group discussion, and each group member can make more suggestions. Therefore, their group can be better displayed in front of the students and teacher, and thereby achieving better results; Students can have a highly impressive of the content of this lesson because of the diversified teaching activities. They can master the content of this study and not forget it easily in the future. Usually, there is an evaluation session at the end of the presentation. The teacher evaluates the students, and students evaluate each other as well. In this way, it helps students to compare strengths and weaknesses between their classmates and them; hence, they can develop their strengths and improve their weaknesses [3].

5.1 Improve Teachers' Mastery of PBL

Teachers should let students participate in the process of teaching actively and focus on the guidance of students. Therefore, teachers should improve their

teaching levels and teaching ability continuously and understand the effective use of PBL teaching deeply to enhance students' enthusiasms and initiatives when they are exploring problems [6].

5.2 Reasonable Arrangements of Teaching Tasks

Students in primary school do not have good learning abilities. Students' comprehensions, thinking, and cognitive abilities are still developing [6]. When teachers design teaching tasks, they must set the problems on life, students can better understand problems, complete the learning project and improve the application of knowledge.

5.3 Focus on the Cooperative Inquiry

In the PBL teaching mode, the problem is the most important element. Students are encouraged to cooperate with teachers to struggle with the projects. But many students are lacking in it [7]. Maybe teachers can play a role in assisting cooperative activity with students. Under this circumstance, the teacher needs to promote knowledge expansion and extension in the process of problem-solving [6]. In this way, students' ability of expression, cooperation, analysis, and problem solving will be well improved [6].

6. COMPARISON OF TRADITIONAL TEACHING AND PBL

6.1 Teaching Approach

6.1.1 Teacher-centered Approach in Traditional Teaching

The traditional teaching method is teacher-centered. On the one hand, teachers control the process and content of classroom teaching; on the other hand, students follow teachers to complete the learning of the content stipulated in the teaching syllabus [8]. Teachers pay much attention to the teaching of textbooks, ignore the application of teaching methods. Thus this approach is not conducive to both teachers and students. On the contrary, it is easy to lose students' interest in the learning process.

6.1.2 Classroom-centered Approach in Traditional Teaching

Another traditional teaching method is classroom-centered, in which students passively receive knowledge in class and then practice a lot through mechanical practice. Traditional teaching emphasizes "teaching" over "learning", and the arrangement and design of each step in the teaching process are mainly considered from

the perspective of "teaching". Students must follow the teacher unconditionally and copy what the teacher teaches in the class, after which the teaching will become a monolithic entity instead of a community.

6.1.3 Student-centered Approach in PBL

Under the background of subject-based teaching, the traditional teaching model with teachers as center and students in a passive position could not meet the demand of current social-economic development and the need for talents [9]. PBL is a student-centered approach to learning that involves groups of students working to solve a real-world problem, quite different from the direct teaching method of a teacher presenting facts and concepts about a specific subject to a classroom of students. This problem is what drives motivation and learning. PBL is often group-oriented, so it is beneficial to set aside classroom time to prepare students to work in groups and to allow them to engage to their PBL project.

6.1.4 Take the Real-life as the Background in PBL

PBL teaching is a teaching approach that allows students to explore problems with the help of various resources in real life. Different from the traditional teaching approach, PBL learning builds a three-dimensional knowledge system based on facts and guides students to solve problems. Practical problem-driven enables students to build knowledge in gamified practices that stimulate their interest and curiosity.

Teachers guide the students through the real-life project, learn about the knowledge, know the importance of cooperation, complete the project, and show the presentation during the class. Finally, the teacher will evaluate the students' performance.

6.2 The Positioning of the Teacher

6.2.1 The Executor of Textbooks in Traditional Teaching

In traditional education, teachers act as the faithful executor of textbooks. Influenced by the traditional educational thought, especially the exam-oriented education view, some teachers usually tell students the conclusion directly when imparting knowledge, and then let students recite it by themselves. Teaching only attaches importance to the imparting of textbooks knowledge and study results, without giving full play to the guiding role of teachers and cultivating students' ability of independent thinking and critical thinking.

6.2.2 The Organizers of Classroom Activities in Traditional Teaching

As the organizer of classroom activities, teachers arrange all the classroom activities, ignoring the autonomy of students, depriving students of the interaction between students and students, students and society, and depriving students of the direct feeling and experience of knowledge. Teachers are difficult to carry forward the "people-oriented" humanistic spirit and the formation of "dynamic generation" teaching ideas.

6.2.3 The Positioning of Teachers' role in PBL

PBL is primarily a learner-centered activity. In any kind of culture, the direction of education is the most powerful and long-term social means to improve human quality, and also the highest art to express human emotional intelligence [10]. However, teachers, workplace mentors, community members, and other adults play a vital role in supporting the success of learners. All learners need guidance, mentoring and feedback to deepen their knowledge and develop their skills. This is particularly important for novices who are completely unfamiliar with the content, skills, and behaviors needed to complete projects successfully.

6.2.3.1 The Guide and Supporter From the Perspective of Problem-solving

During the PBL teaching, teachers design and organize class activities to improve the students' cognitive level, search for a suitable learning direction, carry out various activities during the learning process, and improve the students' learning effects with the teacher's guidance and help. Secondly, teachers also concentrate on how to mobilize students' learning enthusiasm including the way that helps students ensure learning motivation, understand each student's interest, expertise, and personalized learning needs specifically and pointedly. Individual differences among students largely depend on individual differences in understanding of the world. In terms of PBL teaching approach, teachers as guides and supporters can help improve individual differences among students effectively, optimize teaching schemes, and deepen students' understanding and memory of knowledge by giving them the opportunity instead of teaching relevant material and subsequently having students apply the knowledge to solve problems. The instructor is responsible to design and identifying problems that should be complex and vague to encourage students to inquire about them [11].

6.2.3.2 The Participant of Teaching Activities

Compared to traditional teaching, in PBL teaching, there are no longer teacher-centered, and the

relationship between teachers and students has changed significantly. With the remarkable improvements on people's material living standards, as participants in the class, teachers have accumulated rich professional knowledge and learning experience and developed good habits of finding, analyzing, and solving problems. As the main body of the class, students change from passively receiving knowledge to actively exploring knowledge and fulfilling the learning structure. Through the participation and interaction of teachers and students, the collision and mutual communication of thinking between students and students, and between students and groups, teachers and students share the splendor and beauty of knowledge. For the teachers, the teaching process is a process of achieving teaching aspiration and self-value. For students, the teaching process is a process of collaborative development between students' emotional involvement and research development [12].

6.3 Teaching Efficiency

6.3.1 The Simplification of Subject Learning in Traditional Teaching

Traditional education adopts the disciplinary system, and there is little crossover among different disciplines. In addition, aiming to help teachers based on analytic teaching, the role of the curriculum is to help teachers make full preparations before class. These schemes guide teachers better understand the textbooks. In contrast, teachers might ignore teaching materials and forget the teaching plans of intention in the actual classroom. Teachers are too dependent on them, and they fail to establish the connection with other subjects, but mechanically explain the content of the textbook to the students. During this process, students' acceptance ability and differences are not taken into account, which eventually leads to the rapid decline of students' learning effect and the deterioration of teaching quality.

6.3.2 Stress the Result and Undervalue the Process in Traditional Teaching

The teaching process of traditional education emphasizes on the outcomes but ignore the process, which results in students' high marks but poor competence. In traditional education, when scores become the only goal of students, they will gradually lose the work-life balance. Eventually, knowledge has become more and more abstract, and education has become knowledge education rather than human education. In addition, when grades become the only motivation for learning, the nature of teachers' work and teaching efficiency also change which breaks away from the teaching purpose of "preaching, teaching and clarifying doubts", and has gradually become formatted and patterned. After the personality of students and teachers has been affected to a certain extent, the trend

of individuation development is becoming more and more obvious.

6.3.3 The Problems Stimulate Learning Activities in PBL

The driving problem is the hallmark of PBL, which includes feasibility, value, authenticity, significance, and morality. The project selection must aim at promoting students' speculative ability and comprehensive development, and the project source must be as close as possible to the society reality[13]. The problems should not be too difficult or beyond the student's development level, and students should be able to figure out solutions, carry out investigations and solve problems with their cooperative classmates. In PBL learning, questions must be interesting and useful for students in their study proposal and their future career development. In such problems, which play a guiding role in the learning process, mobilizing students' initiatives and enthusiasms, and stimulating students' learning activities. Therefore, advantageous results are yielded by the perception of the PBL approach as students engaged in learning are highly inclined to improve their academic performance [14].

6.3.4 The Interdisciplinary Learning Mastery Subjects Core Knowledge in PBL

Unlike the simplification of subject learning in traditional teaching, PBL learning requires students to apply knowledge from multiple disciplines to solve problems and share the final answers. PBL learning enables to improve students' interdisciplinary ability, which is significant in cultivating students' higher attainment and spirit of inquiry greatly, especially in primary school. It can solve practical problems through cooperative inquiry. Use this interdisciplinary learning must have guides to challenge students' thinking, promote rigor, and build engaging authentic, real-world, inquiry-based learning experiences [15]. To solve problems successfully, students are usually required to use courses of multiple disciplines simultaneously. Thus, students will be guided to actively engage in interdisciplinary learning.

7. CONCLUSION

We analyzed two examples of PBL application in Primary mathematics and Primary English, and the differences between traditional education and PBL in teaching methods, efficiency, and teachers' roles. We concluded that after the new curriculum reform, traditional education no longer meets the requirements of the syllabus. The model of PBL can better meet the requirements of the new curriculum reform in primary schools. Our findings argue that compared with traditional teaching methods, PBL can effectively

improve the practical thinking and problem-solving ability of primary school students, and PBL is designed to enable students to actively explore and acquire specific knowledge. Therefore, in terms of curriculum design, teachers need to consider how to guide students to learn independently and solve problems with standardized subject knowledge. However, the teacher plays a key role as pupils are not yet mature physically and mentally at primary school. Thus, primary school students can have a better grasp of knowledge and can increase their interest in learning.

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