The Application of PBL in Primary School Teaching of China

Jing Li[1, †] Yuchen Zhou[2, *, †]

[1]*College of Education, City University of Macau, Macau, 999078, China*
[2]*College of education, Jiangsu Normal University, Xuzhou, Jiangsu Province,221116, China*
[*]*Corresponding author. Email: 3598668604@jsnu.edu.cn*
[†]*Those authors contributed equally.*

ABSTRACT

PBL (Problem-Based Learning) model not only meets the requirement of student-centered teaching but also reflects the leading position of teachers. PBL is necessary for teaching Chinese by letting students study foundational knowledge and cultivating students' emotional accomplishment. Also, it helps develop students' learning enthusiasm and independent thinking. However, we found that during the practical application process in China, the design of questions was too dull without depth. After solving these problems, students' cognitive level and life experience were not well-considered, students' initiative was not well reflected, and group cooperation was too formalized, which did not play a practical role. We put forward some practical measures on these issues by bringing students good to the real situations. Under these situations, problems are designed based on the student's cognitive level, and group work was divided reasonably for achieving the best outcome. Finally, some of the application of PBL in teaching reading is incomplete and imperfect, which has room for improvement. It is hoped that this review paper can provide some experience and inspire future research to apply PBL in the primary school of China and develop well.

Keywords: PBL teaching model, Primary school teaching in China, Instructional strategies

1. INTRODUCTION

PBL (Problem-Based Learning) was initiated by Barrows, an American neurology professor, at McMaster University in Canada in 1969, which has become a popular teaching method in the world [1]. It has gradually expanded from some higher education to primary education. In traditional teaching, the teacher-centered has lots of disadvantages: students are not interested in learning in class; their enthusiasms are not high, and the classroom atmosphere is rather dull. This series of problems makes the teaching effect for primary school Chinese difficult to achieve the ideal level [2]. To improve this situation, this article will review the application of PBL in the primary school of China, and put forward some useful improvement measures. It is hoped that the research results can inspire the application of PBL in primary School Chinese more reasonable and effective, better complete the teaching objectives of the reform of "New Curriculum Standards for Primary School Chinese", and also provide some references for the research and exploration of innovative teaching methods in primary school Chinese teaching.

2. SHORTCOMINGS OF APPLICATION IN CHINESE CLASS

Problem plays an integral part in knowledge acquisition and meaningful learning. Chin and Osborne pointed out that an effective problem not only helps students during the learning process but also serves useful functions as a pedagogical tool to help teachers promote classroom instruction [3]. Despite the capacity of PBL, much of its potential remains untapped. The reason can be summarized as four points.

2.1. Lack of ill-structured problem

In the current Chinese class, well-structured problems still dominate. The conditions of well-structured problems are clearly defined, and its solution is definite and single [4][5]. Teachers only need to provide students with conditions in a fixed way. Students can use sufficient and clear information to solve related problems step by step according to specific rules and procedures. If students study in mechanical and rigid problem-based teaching mode for a long period, they could only get

"inert knowledge," which means they can master it on the surface but cannot use it flexibly [6]. The absence of in-depth understanding leads to their obvious insufficient knowledge migration ability when facing practical problems. In real life, some problems people face in politics, economy, culture, and other fields with uncertainty, for which is difficult to figure out the answers immediately [7]. Globalization and information society needs talents with innovative consciousness and practical ability, rather than those "problem-solving masters" who can only solve problems with concrete conditions, modeled processes, and fixed answers.

Ill-structured problems are usually defined as a problem in which the existing and desired states are unclear and the method of getting to the desired state is unknown. When they are generated to solve real-life problems, they tend to be complex and involve a high degree of uncertainty [4][5]. These problems tend to be multidisciplinary and their solutions are neither predictable nor been encountered before Without boundaries of content domains. Similar to real-life problems,ill-structured problems cannot be solved directly. Students have to analyze its situation and conceptualize it constantly. During the learning process, students need to construct the question through interacting and communicating with other group members continuously before solving the problem and taking action.

2.2. Neglecting Prior Knowledge and Life Experience

PBL is based on the constructivism theory of modern teaching and holds that learning is a process in which learners actively construct knowledge. However, many questions raised by teachers are only at the level of examining students' memory of knowledge, which cannot encourage students to actively explore, such as "what is it" and "yes or no". Problems with low cognitive levels can sometimes stimulate students' participation and provide feedback. Such problems can be arranged properly and in the right amount. However, if the whole class is full of low cognitive level problems, students' deep thinking cannot be aroused.

To achieve the instructional objectives, teachers tend to propose problems which are lack hierarchy and sequence that make it students are difficult to understand. Teachers have to answer the problem by themselves. According to Vygotsky's Zone of Proximal Development theory, teaching should focus on students' Zone of Proximal Development. That is to say, teachers should provide students with content with appropriate difficulty, and raise problems at a reasonable difficulty level. It can be achieved through active construction and teacher guidance [8].

Learners of primary school are mainly 6-12 years old teenagers full of curiosity for knowledge, but they have difficulty in cognitive thinkings about abstract words. Raising life-oriented problems and mobilizing students' life experiences can make the teaching content more visual, intuitive, and concrete, which could help them understand, transfer, and expand knowledge. Without considering the reality in life, some teachers ignore the students' life experiences when raising a problem. A second-grade teacher raised a problem about"Where did you find the fog and what does it look like?" It is a warm-up question when introducing the scientific fairy tale of a textbook named *Where is the flogging?* Some students said that they had never seen the fog. A girl answered that she had seen a fog at sea before and it was white. The teacher was satisfied with her answer. Others added they had seen fogs in the forest. After answering the questions, all of them got the teacher's praise. A boy answered, "I can see the fog when I open the fridge in summer." The teacher was shocked, she let the boy sit down without giving feedback. On one hand, not all of the students have been to the sea or forest, most of whom live in the city. As a warm-up activity, this problem is too difficult. On the other hand, the teacher did not affirm the boy's answer, and whether it is the fog when opening the refrigerator caused students' doubts, which also affected the teaching effect of the introduction part.

2.3. Neglecting Students' Subjective Initiatives

There is one sentence **that** wrote: "if we stubbornly observe the rainbow through the only color filter, many minds will be mistaken for lack of brilliance" [9]. When designing problems, teachers should start from the perspective of learners, fully respect the initiative of learners, and accommodate all kinds of "different voices" based on learners' life experience, psychological development, and acceptance ability. However, influenced by exam-oriented education, Chinese teaching focuses on whether students' understanding can improve their scores and whether it is the answer that teachers want. Teachers always lead students to read, repeat and remember. Students' independent thinking is replaced by the indoctrination of foundational knowledge. Instead of thinking independently, they have almost no other choice but to sit in their seats and accept passively. Taking the teacher's understanding as the criterion, their thinking is limited, which is a pity.

This phenomenon has occurred in many classes: after raising a question, the teacher asks students to answer it immediately. If one student fails to work out the problem completely, another student will be asked in a short space of time to compensate. Though most students do not answer completely, teachers no longer leave time for them to think and analyze; then they rush to the next part. To cater to the teacher's step, students raise their hands to answer the questions, say a few words, and finally patch

together the answers. The atmosphere seems to be active superficially. Indeed, no student was thinking deeply to organize language and improve logic with high motivations.

When designing PBL, some teachers ignore the generativity of the educational process, and the class is completely centered on several problems designed by teachers. The teaching process should be flexible, dynamic, and situational. However, under the pressure of limited class hours, some teachers are eager to complete the teaching objectives and ignore the generation problems, making the educational process "stereotyped machining and training". Indeed, the neglect of classroom generation also means the ignorance of students' needs, ignoring the problems that students want to know, and only focusing on whether the teaching objectives are achieved. Teachers are in the dominant position and discourse hegemony, controlling and even manipulating students' learning activities. The reading text is complex and colorful, and each student is an independent individual coming from different families with different growth experiences. Therefore, their interpretation of the text must be various and colorful. They put forward a variety of innovative ideas and unique views in class, or challenge boldly in class. However, many original opinions are unpopular in the classroom, which is regarded as disturbing the progress of the classroom or irrelevant to the classroom. If this problem lasts for a long period, students' subjective initiative cannot be brought into play, and they no longer have the ability of critical thinking and reflection.

2.4. Formulating Group Cooperation

Teachers' teaching design is constrained by the teaching system, whereas conflict group activities do not work. Most teaching time of the school is 40 minutes per class. Teachers must strictly abide by the school work and rest time and complete quantitative teaching tasks within the specified class hours. The forms of teaching activities of "teacher-student interaction" and "student-student interaction" are restricted by "class hours." Teachers take efficiency as the criterion for teaching design and arrange activities according to their wishes or expected standards so that group discussion becomes a mere formality. More teachers forcibly terminate the discussion and enter the next part when the students do not fully discuss or make substantive progress. Teachers seldom consider whether students have enough time to think independently through discussion. A very short time was left for children to think independently, consolidate internalization, practice consolidation, and form their ability. Group cooperation is only a part of teaching and does not play a role in promoting thinking. To complete their own "teaching plan" and make their classroom atmosphere active, teachers design group discussions. When the time for group cooperation is

running out and no matter the process and effect of student communication, they cannot wait to terminate the cooperation and organize the report. However, a fixed number of students always participate in the report [10].

3. IMPROVEMENT MEASURES

3.1. Create a situation and Ask questions

Asking questions in situations can help students better understand what they are learning. Setting up the situation is usually carried out using pictures, videos, and animations. Therefore, students can actively participate in classroom activities in an immersive environment. They can interact with teachers and become the protagonists of the class. Teachers and students can complete a class teaching activity in a happy atmosphere [11]. But the purpose of setting up situations is to ask questions, which should be real and purposeful. A situation is something that happens in real life and is relevant to the content of the lesson. In the actual classroom, students' emotions are aroused quickly and naturally enter the situation set by the teacher. Then the base of the PBL teaching method can be set a series of problems related to the situation. It is can be put forward in a step-by-step manner [12]. For example: Why does the writer write the article? What is the content of the passage? How does it express the author's feelings? The students answered the questions through active thinking and completed the teaching objectives of the lesson well.

Students' cognitive level is also an important factor to be considered. The learning process of students is a process of self-construction and self-generation under the guidance of teachers. Students do not passively receive information, but actively select, process and process external information. The learning process is a process of self-generation, Hence, it must be based on students' cognitive development and knowledge experience [13]. If the problem is beyond their normal cognition and the students cannot understand it, then the problem-solving process is meaningless. The best setup is to get the "degree" right. Questions are not only understandable but also must be hard learning. In this way, we can achieve better results.

3.2 Teamwork for the best results

Cooperative learning starts from the collectivity of the teaching process and focuses on the interaction between students to promote the collaborative development of students' personalities and teamwork [14]. In short, cooperative learning is in the form of groups, and each member achieves the common learning goal through trying their best efforts. During the process, we should pay attention to cooperation, learn from each other, and achieve the most effective together. From groups with a purpose, clear tasks and individual

responsibility, make the members in the group interaction and depend on each other, pay attention to the development of social skills, play a role of commander of the support that are the main characteristics of the cooperation study [15]. Hence, it is important for cooperation groups on how to divide groups of scientific. Maybe we will be divided into good cooperation team that can better complete group tasks. This can be done according to the actual situation.

First of all, students in a class are divided into several study groups according to the number of students, but it should be noted that the number of students should not be too much, and it is better to control between 2--5 people. Secondly, it is necessary to students' performance, ability, and gender. The strength of group members should be equal, and the level of various subjects and comprehensive ability between groups should be balanced. And there should be girls in each group, with the right proportion of boys to girls. Generally, the principle of the same kind between groups and inhomogeneity within groups should be followed: that is, there is little difference in the composition of the characteristics of the overall members of each group, but the inhomogeneity of the group members is conducive to helping each other, learning from each other and improving together [14]. Through this way, it will be convenient to put forward tasks of different difficulty for each group. Better group members will finish the more difficult task together, and the worse group members finish the less difficult task together, Therefore, the whole class will have a sense of achievement. Finally, each group should elect a leader to organize and coordinate all the work. After this, better team spirit can be formed. Teachers should pay attention to students' emotional changes while maintaining good classroom order in the process of cooperative learning. If students have any problems, they should immediately provide help to the students.

3.3 Allocate Time and Segment Teaching

The use of PBL in the classroom is not meant to be applied from every aspect but in the appropriate place. Considering the curriculum schedule and arrangement of Primary School Chinese, it takes a relatively long time to implement PBL, which is not suitable for each teaching section and cannot reflect its advantages. For primary school Chinese, its reading section is an important part of the whole Chinese learning. In reading teaching, the PBL teaching method can not only make students have a deeper understanding of reading but also cultivate students' ability to think about problems to a certain extent. By setting some questions, students are always problem-oriented in the process of reading, and reading is purposeful and targeted. To a certain extent, their ability to think about problems or consciously read has also been cultivated [16]. For example, in the teaching of

Baotu Spring, the teaching purpose of let students understand the characteristics of Baotu Spring and motivate students to love wonderful scenery and a pair of eyes for beauty by reading the text. The teacher can first render the scenery atmosphere to the students when designing the question, and use this question to introduce the students into the learning situation. For example, why Jinan is famous for Baotu Spring? Which part of the author's description impressed you most in the reading? By setting the problem, it is convenient for students to learn the author's method under the problem-solving situation, learn the author's description of scene character, specifically and vividly, and train students' ability of observation and imagination, Finally, it will be possible for achieving the effect of knowledge conversion to reality. To increase students' sense of participation in the classroom and activate the atmosphere, the teaching method of "role-playing" can also be applied to the classroom, with the cooperation of multimedia to achieve the goal. The application of the PBL teaching mode in reading teaching changes the traditional roles of teachers and students in class and truly realizes the perfect combination of theory and practice. However, in the teaching process, teachers should pay attention to the importance of question design to enhance students' initiative in Chinese learning, promote students' interest in Chinese reading, and deeply study the author's spiritual in the text, which can improve students' Chinese reading level comprehensively [17].

4. CONCLUSION

Based on the current situation of reading teaching in China, it is urgent to put forward a practical teaching way to inject passions into Chinese teaching and provide a teaching method to improve the current situation for front-line teachers. PBL teaching mode is not only suitable for Chinese teaching in primary schools but also can produce positive effects. With the PBL teaching mode, students are placed in a problem situation. They can analyze and solve problems through group cooperation, and acquire knowledge through exploration. Students are the main body of learning, which can help students learn to learn and promote students to construct knowledge actively. However, in the practical application, PBL teaching mode also has some problems, such as lack of ill-structured problems and unreasonable creation of problem situations, neglect of students' existing knowledge and experience in problem setting, low efficiency of group cooperation, and inability to carry out autonomous learning well. Although the application of PBL teaching mode in primary school Chinese reading teaching is difficult and has some problems, it is in line with the development trend of the times and the teaching method of the new curriculum standard reform. Therefore, given the above problems, some strategies were put forward to promote the PBL teaching model used effectively in primary school

Chinese reading teaching. There are strategies such as invoking the use of real-life scenes, improving the efficiency of group cooperation, allocating different parts, and highlighting the application of PBL in the reading part reasonably. Hopefully, this can provide inspiration for further PBL education.

REFERENCES

[1] J.X. Shen, H.Y. Wang, PBL: A new type of teaching mode, Fudan Education Forum, 022 (002), 2001, pp. 36-38.

[2] L.N. Ji, Application research of PBL Teaching Method in Primary School Chinese, Reading, Writing and Computing (Teacher edition): Education forum for All-around Development (33), 2015, pp. 1.

[3] C. Chin, J. Osborne, Students' questions: a potential resource for teaching and learning science, Studies in Science Education, 44 (1), 2008, pp.1-39, DOI:https://doi.org/10.1080/03057260701828101

[4] D.H, Jonassen, Instructional design models for well-structured and ill-structured problem-solving learning outcomes, Educational Technology, Research and Development, 45 (1), 1997, pp. 65-94.

[5] D.H. Jonassen, Toward a design theory of problem-solving, Educational Technology, Research& Development, 48 (4), 2000, pp. 63-85.

[6] R.E. Mayer, M.C. Wittrock, Problem-solving transfer. In D.C.Berlinert, & R.C.Calfee (Eds.), Handbook of educational psychology, New York: Macmillan, 1996, pp. 47-62.

[7] D.H.Jonassen, Learning to Solve Problems: A Handbook for Designing Problem-Solving Learning Environments (1st ed.). Routledge, 2010, pp.1-6. DOI:https://doi.org/10.4324/9780203847527

[8] I.Guk, D.Kellogg, The zpd, and whole-class teaching: teacher-led and student-led interactional mediation of tasks, Language Teaching Research, 11 (3), 2007, pp. 281-299.

[9] H.Justin, The learning revolution, Information Week, 1998.

[10] H.X, Wang, Don't let teaching activities becoming formalism, Academic Weekly, 2(11), 2015, pp. 1.

[11] J.L. Li, Situational teaching: Situational education, Shandong Education Press, 2000.

[12] D.J. Yu, G.X. Xu, Exploration and practice of PBL teaching method in primary school Chinese teaching Science and technology the wind (24), pp. 2.

[13] Q.J. Li, Teaching activities should respect students existing knowledge and experience. Basic education forum: Teaching research edition, 000 (004), pp. 47-47.

[14] F.K. Zhang, T. Zhao, Application of Cooperative Learning theory in College English Reading Teaching, Language scope(6), 2004, pp. 6.

[15] J.Cuseo. Collaborative, cooperative learning in higher education: A proposed taxonomy, Cooperative Learning, and College Teaching, 2 (2), 1992.

[16] W.Qian, Research on the application of PBL model in Primary School Chinese Reading teaching, Learn weekly (15), 2018, pp. 2.

[17] W.Qian, Practice and Exploration of PBL model in Primary School Chinese Reading teaching, (2019 - 9), 2021, pp. 124-124.