Comparing PBL between China and America Class

Yuhan Chen[1, †], Yilun Wang[2, †], Qing Ye[3, *, †], Zhihao Zhou[4, †]

[1]School of foreign languages, Gannan Normal University, Ganzhou, China

[2]Department of arts, Sichuan University, Chengdu, China

[3]Institute of educational sciences, Hubei University of Education, Hubei, China

[4]School of foreign languages, Hubei University of Education, Hubei, China

*Corresponding author: 100868@yzpc.edu.cn

[†]Those authors contributed equally.

Abstract. Problem-based learning (PBL) is a teaching model which has been widely applied in class throughout the world. PBL originated in America and developed systematically in western countries. To further the PBL development in China, this paper mainly makes comparison of PBL in class between China and America based on two authentic PBL class cases and finds out that PBL classes differ in process monitoring, project setting, and evaluation of works. At the same time, they are similar in the diversified assignments, project duration, and creative thinking skills. By analyzing these points, this research has three main findings :(1)The American case favors project-based learning more, whereas the Chinese case emphasizes problem-based learning; (2)When delivering the curriculum, it is crucial for teachers to strike a balance between PBL and related subjects, and obstacles, length, or materials should also be taken into account. ; (3)Group collaboration is the primary means of reducing the management challenge in PBL teaching, and strengthening PBL teaching management is a link in the teaching process. The paper contributes to helping teachers who are committed to PBL adopt the good points and avoid shortcomings of the lesson plan and project design.

Keywords: Problem-based learning; Comparison; China; America.

1. Introduction

Problem-based learning (PBL) is a problem-oriented teaching model where the whole teaching process is based on a real problem [1].The American professor of Neurology Howard Barrows first designed PBL in 1969.Currently the method has been widely used worldwide and is called the “the most impressive innovation” in the educational reform.[2] Theoretically, western researchers has done lots of studies systematically including the principles, elements, design process, curriculum module and so on. Practically, PBL was first applied in the medical education and then spread to many other fields especially in the university education. As for Chinese experts, they mainly focus on comparison of PBL and traditional teaching model, the review of western PBL development and cases. To apply PBL in class, they studied this method in certain subject like math, science and chemistry as well. This paper compares PBL in class between China and America based on documentation, contrast and case study method. To be more specific, a review of PBL development in China and America will be illustrated first. The two cases have comparability in these aspects:(1)Chinese and American students are well disciplined so that the class performances are impressive to observe;(2)Both Chinese and American students are under study pressure because of the examination system;(3)The two cases are typical with a complete PBL teaching structure;(4) Courses are involved with interdisciplinary;(5)Students are required to make specific works rather than printed paper work(such as a book or video) to show their learning outcomes. By comparing and analyzing the syllabus of two PBL cases from the two countries, similarities and differences between the two will be presented. At the end a conclusion to enhance the quality of PBL in class will be given.

2. The development of PBL

2.1 The development of PBL in China

Problem-based learning (PBL) stems from America and has been used in China from 20 century, especially in university teaching, which is different from the traditional Chinese teaching mode-learn by rote, teacher-centered, and exam-oriented [3]. After a new policy came out in 1996, China had a higher demand for developing teenagers in competence education. PBL, an advanced and emerging teaching strategy, is in line with the policy. It was brought in China at the end of the 20th century and developed in medical education in the beginning of the 21st century. When seeing great success was achieved in PBL teaching, a lot of doctors and experts, who specialized in education, promoted the development of PBL. It contains constructivism and can be a new key to new curriculum reform. Wang says that PBL promotes laying a flexible foundation and is good for improving both critical and creative thinking [4] .However, in Chinese research field, the key point related to PBL is mainly concentrated on aspects such as basic theory, reform of the educational model and design of the teaching process currently. Lacking great ability of controlling class and interpersonal skills among students makes PBL not widely used in every class at present. Just as Du et al. argue that it is still most applying in medical education area [5]. As an effective and efficient teaching strategy, PBL tackles a host of disadvantages caused by cramming method of teaching, allowing students to communicate, collaborate and cooperate with each other via critical thinking and active learning. Just as Bridges holds the view that PBL is the contextualized teaching method that focuses on students and real problems.[6].

2.2 The development of PBL in America

Problem-based learning (PBL) originated in America in the 1960s, when Case Western Reserve University started using this method in medical education. By applying the method to clinical study, PBL has become a particular feature of some universities in North America, and 70% of the American medical college used this method in the 1980s. After continuous practice in medical fields, PBL had a significant enhancement theoretically. Barrow & Tamblyn published a book named *Problem-based learning: an approach to medical education*, which first illustrated the teaching structure and educational thoughts of PBL. Since then, PBL has been widely used in many fields, including architectural engineering management and psychology by European and American universities.[7]. To further develop PBL, some universities also held funds and educational services for PBL. In 1984, a report released by Boyer University was in support of a research-based study. In 1997, the university of Delaware constituted Institute for Transforming Undergraduate Education. In 1988, the university constituted a PBL Information Center sponsored by Pew Charitable Trust, which promotes the development of PBL throughout America.

Therefore, PBL has a historical development in America. It has not only been applied in lots of curricula systematically but also some studies to enhance its development has been done [1][3][4].In American teaching training of PBL, experts inspire trainees to take practical teaching model actively, while trainees tend to receive instilling training which negatively affect the training outcome. As a result,it is of significance to establish PBL teaching training center and increase investment to strengthen teaching staff construction in China.[8]

3. Case study of PBL curriculum design between China and America

3.1 PBL case in China

This program is based on Oxford English 5A Moudule4 Unit1 Water, how to make tea? (The name of the lesson) And it focuses on students from primary school, Grade 5, who have a little knowledge of English tea but have a positive attitude to English learning. In this project, the knowledge objective is learning the steps of making tea and having a primary understanding of the names of English tea.

After about one month learning, an English tea culture brochure including the tea's origin, types, quality, ability, etiquette and culture value will be made by students themselves, then sharing their achievements in the front of the following English tea culture exhibition. Therefore, they will be able to develop their creativity and social practice to some extent. It is the final objective of this program to make students realize to spread Chinese culture effectively and strengthen their Chinese confidence.

The process highlights problem-based and project-organized learning, centering students and tackling the real task. According to Bridges, Student Centered PBL attaches importance to the development of lifelong learning skills[8]. Students involved should be managed to transmit Chinese tea culture by making bilingual handbooks with their own ideas. Such project acquires their existing knowledge as well as information gathered, thus it is reasonable and crucial to brainstorm, group discussions and even make KWL charts (the chart including three parts: what I know, what I want to know and what I learned). Creating five sections in each handbook is not a big problem, for students have easy access to categories, function, etiquette and cultural value of Chinese tea via internet, letting alone drinks produced with their own thought or imagination. While translation skills or strategies are needed whether to identify or to create expressions that are understandable for foreigners, which are advanced ability for primary pupils. Making a "new" beverage seems a quite personal and unrestrained task, but it is necessary for students to find out whether such product is already launched on the market. Low-structured is also a disadvantage among sections for such a handbook, even one section is removed will not have any effect on others. Therefore, teacher is responsible for assistant to students at right time; filtering and selecting information play a part in student's side.

Under the way of PBL learning for about one month, students produce new booklets by themselves and share their learning with foreign friends. They achieve synthesis of the Blum learns target classification. However, this project seems have no specific scores evaluation standard. Their ability of creating and the experience social practice to some extent develop effectively. But whether the brochure can symbolize the project original intention is with doubt. Students break up the disciplinary boundaries, bringing the new knowledge into real life. Not only they make creative corporations and spread the Chinese tea culture, but also improve their Chinese culture confidence.

3.2 PBL case in America

This program is based on an actual teaching event. Brison Harvey, an American history teacher from senior 2, designed a "20% google history" project based on PBL. He was inspired by Google, which encouraged employees to spare 20% of their time to discover their interests and make their products. Similarly, he required students to search for information and create a piece of historical work [9]. As students already took the final exams before the semester ended, Harvey used the last month in school and taught students some "interesting history knowledge." The knowledge objective of the project is to learn about a period of American history and create a piece of historical work. The procedural objective is to explore ways to review historical materials and design the historical work. Students will develop their ability to search for information through an online search, group discussions, and library browsing. When completing the whole work, the emotional objective will be accomplished: students will become more self-confident and interested in history as a result of the whole work.

According to Neville, the PBL model is problem-centered, where the success or failure of question design directly affects the effectiveness of teaching and learning[10]. In order to make the questions more concrete, the presentation of these questions should be in a particular form. At the beginning of the course, Harvey used Google's "Personal 20% Innovation Time" video to show students the features and benefits of Google's innovation services, which introduced one of the course topics and completed the initial construction of the problem situation. In addition, Kaur claims that students are required to achieve critical and creative thinking, using their knowledge to solve contextual problems in the PBL model, unlike the traditional rote memorization of learning [11]. Harvey proposed that the task of the project was for students to use both independent search knowledge and the innovation of Google practices to produce a piece of work that would present a theme about American history [11].

Notably, the work could not be in a form seen in a traditional classroom, such as a slide show or an academic paper, which requires students to abandon traditional thinking about the assignment. Creating a history piece will reinforce what they have learned about American history in the textbook. However, it will also need to show the students' deep thinking about a topic in American history. Nevertheless, the diversity and uncertainty of the forms of the works led to the difficulty of developing evaluation criteria. After understanding the students' suggestions for the evaluation criteria, Harvey suggested that the only criterion for evaluating a project as good or bad is whether the content of the work is relevant to the student's chosen topic. Munawaroh argues that the PBL model can help students develop the ability to solve new problems and be constantly challenged. During the work's production, students must be divided into fixed groups[12]. The group members complete the required data collection, discuss the problems encountered during the production process, such as the work not being completed within the time limit, and finally get a solution. The teacher's guidance and advice are necessary when students face a situation where they cannot solve the problem.

Through roughly one month of production, students develop an initial idea about the piece into an entire work. In the exhibition, students exhibit their work and view other groups' work results. Although the exhibition was set up for students to learn from each other, the lack of teacher and student evaluation was not conducive to post-lesson reflections and summaries.

4. Comparison of PBL in American class and Chinese class

4.1 Similarity

4.1.1 Diversified assignments

Teachers distributed the main assignment in a diverse way. In China, students are asked to design an English tea culture brochure and demonstrate it in class, while a piece of special work that would present a theme about American history needs to be done in America such as a dance history film and a score-winning game about the Great Depression.

These assignments which are different from traditional paperwork can show the authenticity feature of PBL. Lian holds the view that the quality of problem design directly affects the implementation effect of PBL, and a good problem must be authentic, in another word, the problem should come from reality [13][7].Therefore, presenting a diverse assignment is the essence of problem-centered model which can improve participants' independent learning capability and creativity.

4.1.2 Project duration

The project lasts one month both in China and America. Practically it is divided into several sections and separated assignment in each section is required to finish within a week. Theoretically, barrow comes up with the five steps of problem-centered learning and Benjamin et al. design the eight steps of PBL. Wu explained the reason why the project is long and complex, and he proposed that every section including the course goal, process and content should be elaborated in order to make effective teaching performance in practical curriculum like PBL [14]. In this case, student can cultivate different competence in different sections, however the disadvantage is that teacher may find it hard to review all the knowledge using PBL method, thus the method could not be widely applied to all the courses.

4.1.3 Creative Thinking skill

Ersoy & Başer argue that the PBL teaching method has a significant positive effect on improving students' higher thinking skills, especially creative thinking skills [15]. In the case of Lafayette High School in the United States, the student's work cannot be in the form of a simple text, picture essay, or PowerPoint. Therefore, students need to use creative thinking to think of new forms of expression that can visually and accurately present the content of their chosen topic. Chinese case also reflected

this point. After systematically learning about Chinese tea culture and basic graphic design methods, students need to creatively design a new type of tea drink. During the design process, students ensure the uniqueness of the tea drink by being flexible in choosing the type of tea and thinking about how to make a tea drink.

4.1.4 Teacher guidance

Barrows claimed that practical guidance of teachers is conducive to improving students' independent learning efficiency in the PBL teaching process [16]. Both the development of the work log in the U.S. case and the creation of the task schedule in the Chinese case demonstrated the teacher's guiding role, i.e., students need to plan what they would rationally do at each stage with a clear idea of the task time. During this process, the teacher provides enough time for students to integrate the information they have gathered and present their ideas. When the plan does not make sense, the teacher needs to provide appropriate help and advice to help the students complete the final work according to the plan.

Table 1. The differences of PBL in class between America and China

Differences	America	China
Process monitoring	Includes parents, teachers and students	Includes teachers and students
Project setting	Based on the whole book	Based on a specific lesson
Evaluation of works	Give no comments	Give some comments

According to Table 1,the differences of PBL in class between America and China lie in process monitoring, project setting and evaluation of works.

4.2 Differences between PBL in American class and Chinese class

4.2.1 Process monitoring

Compared to overseeing the process of the project, American teacher resort to more comprehensive and flexible ways. In Chinese project, students mainly use KWL chart to collect the information with extra ideas created by teammates, which just focuses on students' part and the teacher's guidance. But a kind of log is used by students for being monitored by both teachers and parents in America. This allows them to revise their plans, being constantly suitable for completion. It is not only of value to time management but also to project management. Behind the situation lurk one fundamental possibility- some parts of Chinese parents are not willing to get involved in kids' homework whether actively or passively, for self-doubt from traditional education and the hustle and bustle of work, which is deeply from cultural difference. Students become the core of teaching activities, and teachers only need to play the role of a good listener, and guide [17].

4.2.2 Project setting

Compared the course setting of America, the course setting of China is more specific. China bases on the specific lesson of a textbook, and beginning the project set by teachers. While America bases on the whole book as they can apply arbitrary knowledge, they have learned this term to begin the project. The difference between the course setting mainly owing to the education concept of two countries. Jiang et al. argues that Chinese parents prefer to create conditions to let their children live a better life [18].While America parents give children more autonomous rights instead force them to do things they are not willing to. As Chinese students always asked to analyze questions under a certain situation already done by parents and teachers, thus students don’t know what and how to do if their teachers don’t give them corresponding requirements. American class does not set fixed mode, so students are more active thinking in class. They are free to express different ideas. Provided a free and creative thinking environment in order that students could gain more the right to express themselves freely, which is more than benefit to carry out the course.

4.2.3 Evaluation of works

China has evaluation to works made by others, but America has not. When students works are finished, Chinese teachers will give works feedback. Students and teachers are able to make some comments on works from all aspects. In America, student's work is just an outcome of the project that shown in front of students, teachers and parents. The reasons for this are that the educational method has a slight distinction between China and America. American teachers are usually not interfering with students' decisions. They accept all results and thoughts that students made and put forward. Chinese like giving their opinions on something they prefer. Teachers and parents evaluate every decision that children make to show they are paying attention to them. Ding et al. holds that Chinese homework usually pays attention to written ability[19].Although all the students works can be shown at the end of the project, the definite advantages students can learn and disadvantages they can avoid are not clear as for pupils. Therefore, it is necessary to make standardized scoring rubric to give students reified feedback. Having a clear understanding of their weaknesses and strengths so that next project they can find what they need to do and how to do quickly.

5. Conclusions

In conclusion, the American case is more inclined towards project-based learning, while the Chinese one characters problem-based learning. Although some differences between the process, both follow similar guidelines--based on real-world problems, students solve problems or analyze conclusions through brainstorm, critical thinking, analysis and evaluations with the help of the teacher. It is key for teachers to find the balance between PBL and related subjects when they deliver syllabus, and difficulties, length or materials should also be considered. Furthermore, strengthening PBL teaching management, as an important tool, is another link in the teaching process, which allows the teacher to monitor student learning behavior. Group cooperation is the main way to reduce the difficulty of management whether in general education or professional education. This paper compares two PBL cases, and it helps teachers who are committed to PBL adopt the good points and avoid shortcomings of the lesson plan and project design. Some ideas in this paper will trigger inspiration from teachers in China and outside China that allow PBL teaching design to become more doable, sustainable, and viable. In the future, if more relevant cases can be involved, more specific similarities and dissimilarities will be summarized. Therefore, it is more convincing to analyze different disciplines but at the same learning stage for students.

References

[1] Liu Baocun. Problem-based learning in American research university. China Higher Education Research (10)., 2004, doi: 10.16298.

[2] Mazhen. PBL teaching method in the United States and its application in the teaching of analytical students in colleges and universities in China. (a master's dissertation, Shandong Normal University), 2011.

[3] Wang Bei,Yang Yanfei, Li Lulu(2022). Application research of college English PBL teaching mode to promote deep learning. Education and Teaching Forum.

[4] Wang Chunyan. (2013). the research comparisons and enlightenment of PBL at home and abroad. Textile Garment Education (1), 3.

[5] Du Chaodong, Liang Si, Pan Guishu. (2015). "PBL teaching" analysis of research statu. Journal of Zunyi Normal University.

[6] Bridges, E. M.. Problem based learning for administrators [M]. Eugene, OR: ERIC Clearinghouse on Educational Management, University of Oregon, 1992: P5-6.

[7] Barrow, H. S. Tamblyn, R.M. (1980). Problem-Based Learning: An Approach to Medical Education. New York: SpringerPublishing Company, 18.

[8] Wang yuedan, Zhangyan, Xulan, Zhang Zhongyuan&Zhu Yunlan. The comparison of different solution for eight possible problems in PBL by teachers from China and the United States. Chinese Journal of Medical Education, 2007, (05), 97-99.

[9] Zheng Gengbiao. The application of PBL in the history class—based on an American case"20% google history". Teaching Reference of Middle School History, 2020, (03), 46-48.

[10] Neville, A. J. (1999). The problem-based learning tutor: Teacher? Facilitator? Evaluator? Medical teacher, 21(4), 393-401.

[11] Kaur, J. (2017). Problem Based Learning (PBL): An Innovative Approach towards Teaching and Learning Process. International Journal of Research in Social Sciences, 7(9), 235-247.

[12] Munawaroh, M. (2020). The influence of problem-based learning model as learning method and learning motivation on entrepreneurial attitude. International Journal of Instruction, 13(2), 431-444.

[13] Wu Gang. A review about problem-based learning. Shaanxi Education Education (higher education edition), 2012, (04), 3-7.

[14] Lian, L. (2013). A review about problem-based learning. Journal Of Fujian Normal University (philosophy and social science edition), (04), 126-13

[15] Ersoy, E. (2014). The effects of problem-based learning method in higher education on creative thinking. Procedia-Social and Behavioral Sciences, 116, 3494-3498.

[16] Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview. New directions for teaching and learning, 1996(68), 3-12.

[17] Lin Yafeng (2022). The application of PBL teaching mode in the Chinese reading teaching in the upper grades of primary schools. Tianjin Education.

[18] Jiang Chunyu, Guan Ting, Li Mengge. Analyze the difference of American style education and Chinese style education. The Exam Week, 2014, (98), 1.

[19] Ding Lin, Ye Lijun. The difference of mathematics in middle and primary school between China and America. Education Exploration, 2009, (1), 3.