

Exploring the Effects of Online PBL in Xuexitong

Ziling Fu^{1,†}, Xinyi Shi^{2,†}, Zhihan Zhang^{3,*†}

¹ School of foreign languages, Guangzhou Nangfang College, Guangzhou, 510900, China

² School of Geographical science, Harbin Normal University, Harbin, 150025, China

³ School of Russian and Eurasian Studies, Shanghai International Studies University, Shanghai, 201103, China

[†]Those authors contributed equally.

Abstract . The objective of this research paper is to critically examine the advantages and challenges of implementing online Problem-Based Learning (PBL) using the Xuexitong learning app. The paper highlights the diverse range of functionalities offered by Xuexitong that align with the principles of PBL. Students can access shared materials, form study teams, submit assignments and receive feedback, conduct online surveys, and engage in group discussions. Teachers, on the other hand, can upload electronic textbooks, communicate with students conveniently, provide guidance on student projects, and assess assignments. Furthermore, the paper presents a comparative analysis of PBL with other teaching methods. The findings reveal that online PBL transcends spatial barriers and facilitates face-to-face communication. It enhances students' problem-solving skills, promotes effective time management, and fosters a sense of cooperation among learners. For teachers, online PBL promotes more active teacher-student interaction, allowing for effective guidance and feedback exchange with students. Despite the advantages, the paper also acknowledges the challenges associated with online PBL, including technical issues related to online devices and learning materials. By analyzing various online PBL cases, the paper identifies potential obstacles that may arise in the implementation of PBL through Xuexitong. The other problems are students' reluctance to learn independently and the lack of attention when studying online. The paper serves as a valuable resource for enhancing the online PBL system, providing teachers and students with a comprehensive understanding of the functionalities offered by Xuexitong and how they can be effectively utilized in online PBL courses. However, it is important to note that further research is warranted to identify and address potential technical challenges associated with online PBL.

1. Introduction

In the traditional teaching model, it is difficult for students to be active in classes, especially during the pandemic. Without face-to-face interactions, this teaching model may lower the student's efficiency and they tend to listen to teachers without expressing their own ideas. In that case, it is necessary for teachers to do online PBL teaching. Recent theoretical developments have revealed that online PBL is a crucial teaching model for students to cultivate critical thinking and for teachers to learn about students better. While choosing what kind of online platform to do online PBL can be a problem, based on its distance teaching characteristics. In this paper, the authors found that Xuexitong, an online autonomous learning platform for both teachers and students in China, can meet the requirements of having online PBL. As it has different function areas for each step of having online PBL, saving teachers a lot of time to organize students. Therefore, with Xuexitong, having online PBL can be more convenient, apparent, and easier. However, there is insufficient research on having online PBL in Xuexitong, so it would

be beneficial to this education sector to analyze it. The purpose of this paper is to identify the advantages, challenges, and solutions of project-based learning in Xuexitong.

2. The overview of online PBL in Xuexitong

Nowadays, although PBL teaching is utilized by most people, its main teaching mode is offline. However, after the epidemic and the implementation of the double reduction policy, online classes have gradually become the mainstream learning method. Learning platforms like Xuexitong that include "Online PBL are the products of a combination." If the traditional teacher-taught teaching method is applied to online teaching, students will lack a learning atmosphere and be more passive in class. Finally, the effect of students listening to classes is obviously inferior to that of offline listening. Dost et al. proposed that PBL could be a viable solution to the difficulties associated with traditional online education participation. [1]. In contrast, online PBL largely solves the problems of

*Corresponding author: 201103004@shisu.edu.cn

students' lack of concentration and less interaction in online classes.

At the same time, online PBL breaks through the spatial and temporal difficulties of offline PBL teaching. Ng et al. pointed out that the requirements of offline PBL for specific space, time, and other conditions limit the potential of PBL teaching [2]. Traditional PBL teaching is face-to-face communication between teachers and students, which requires everyone to carry out at a specific time and a certain space, and it is very inconvenient to do it offline, so there are certain limitations. As Lu Xiaomin and Hao Ruifeng proposed, online PBL can enable students to use the fragmented time to learn more flexibly and enable teachers to answer students' questions through the platform [3]. Thus, through the platform of Xuexitong, the restrictions of time and region are broken, so that students in different places can have deep interaction, and teachers can promote the curriculum more comprehensively and form a complete PBL curriculum system.

Xuexitong can not only enable students to learn from a distance, but also serve as a learning tool in class. Because it is one of the important interactive approaches for college students in the classroom, which is a very suitable online PBL platform. Wang Xibing and Wang Tan hold the view that Xuexitong provides technical support for the implementation of PBL learning [4]. Xuexitong is a very popular learning application at the university level. Users can use the mobile or computer side. It has a variety of functions, including classroom teacher-student interaction, group problem discussion, data review, homework submission, questionnaires, online exams, and other complete learning systems. Xuexitong provides students with a more convenient one-stop learning platform, and online PBL is one of the featured features. For example, teachers can first set the problem situation in Xuexitong, and students can discuss in small groups, ask relevant questions, and express their views through function by raising their hands, rushing to answer, or leaving a message. After the teacher gets the students' ideas, they focus on supplementing, connecting, and extending them, constantly digging deeper into the problems and thinking deeply, so that the learning effect of students is more significant. Therefore, by utilizing the learning channel to carry out PBL teaching, students are more interested in the topic and more involved, so teachers can obtain more active and accurate teaching feedback from students.

The online PBL teaching function of Xuexitong is generally used by college students for previewing, interacting, and reviewing. Guo Fengtao proposed that the use of learning can better solve the problem of separation before, during, and after class in the traditional teaching mode [5]. To address this issue, major universities have gradually promoted online PBL teaching via apps like Xuexitong in recent years, allowing students to participate in course learning before, during, and after class. The teacher posts relevant content in the Xuexitong prior to the lesson, and students leave messages on it to discuss and ask questions. Teachers provide feedback to students in class, and after class, students can engage in in-depth discussions about the class's content using Xuexitong.

Students must not only accept the content taught in class, but also think actively and independently. PBL columns in research are a convenient way for students to ask questions and dig deeper based on what they have learned.

3. The Practical Value of Online PBL in Xuexitong

3.1 The Functions of Xuexitong

Xuexitong, a complete studying system in China, provides different kinds of access to learning resources. With Xuexitong, teachers can create their own classes, upload related learning materials, test students, and give assessments and homework. Students can study with their teams, communicate in the discussion area, and review shared learning materials and assessments without limitation.

3.2 Online PBL model and its steps in Xuexitong's application

According to Ma, online PBL has a conventional model similar to face-to-face PBL, and these steps are easily accomplished in Xuexitong [6]. According to Ma's research, the application of online PBL can be divided into the five steps listed below [6].

- **Finding a problem deeply connected to reality:** In the discussion area of Xuexitong, teachers can upload related materials such as videos, slides, and topics for students to generate ideas. And then students discuss and express their ideas on that area.
- **Forming study teams:** Students will be divided into several teams or team up for free and have their own group area in Xuexitong. In that area, team leaders hold meetings and assign tasks.
- **Identifying problems:** In the group area of Xuexitong, teammates communicate with each other and identify the final problem. According to their final problem, team members search for relevant information and share it in their group area. The whole process can be seen by teachers in Xuexitong so that teachers can give suggestions.
- **Self-directed learning:** Students study shared learning materials and ask teachers questions to promote the project's progress. The study times of learning materials will be recorded in the system, and teachers can remind students who do not check them in time.
- **Evaluating the project:** At the end of the project, students have to show their outcomes to teachers and classmates in Xuexitong, which has an assessment function for them to score and give evaluations. In addition, all of the data will be kept including evaluations, learning resources, and project outcomes for students to revisit in the future. So with Xuexitong, promoting and completing PBL can be more convenient and easier.

3.3 The Advantages of Online PBL

When it comes to PBL, some people may tend to consider face-to-face PBL firstly and question the effectiveness of online PBL. Amisshah holds the view that online PBL can be successful like traditional PBL as long as the whole project begins properly and is organized [7]. It can promote students' Problem-solving abilities, time-management skills, and cooperative skills. Besides, teachers will feel satisfied and accomplished during the project process as the group learning situation and discussion situation are transparent to them. In that case, they can know how much knowledge students have learned.

What's more, online PBL has other merits that traditional PBL may not have. During the online PBL process, students study remotely which means they can start learning at any time and space. Staying in their comfort zone may increase their efficiency and develop potential. Besides, the learning resources, PBL results, and assignments can be kept in that system. This means students can get chances to revisit and review them at any time in the future, and even they can print what they need in Xuexitong. Therefore, they can construct their own knowledge step by step. In the Li, online PBL in Xuexitong can improve students' academic performance and interest in studying [8]. What's more, metacognitive skills will be built during the process. In the online PBL, students still need to predict and manage how much time each sector will take up, and try to complete tasks before the deadlines [7].

4 The Challenges and Solutions of Online PBL in Xuexitong

A main challenge of online PBL in Xuexitong is students' reluctance to have teamwork. In the conventional teaching approach, teachers usually guide the students to study. Students often hold the passive psychology of "We learn what teachers teach", lacking the spirit of active exploration [9]. Some students regard that the knowledge and ideas taught by teachers are always correct. If they form a group with other students, the learning efficiency will be decreased. And it may eventually affect their academic performance. Some students lack team spirit, so it is difficult for them to negotiate and cooperate with others. Without listening to mutual advice, they are unable to reach a consensus. Therefore, they are not willing to accept teamwork [10]. Gan pointed out that the main reason for the challenge of PBL among students is that the change from traditional teaching mode to PBL brings new difficulties to students' learning [10]. Students will have a sense of discomfort in the process of changing from passive to active learning. This problem needs the guidance of teachers and a period of adaptation training so that students gradually form the consciousness and habit of independent learning. In the process of adapting to PBL learning, students can also exercise their communication and cooperation skills.

Secondly, online PBL group work is conducted in an online environment, which might be influenced by some

technical problems. Wilcha cites several technical challenges such as students' and teachers' lack of access to online devices, hardware, and software problems of online platforms [11]. It is also difficult to establish a reliable Internet connection and guarantee the speed and quality of the Internet. Sometimes there are audio and video playback problems with devices. Sometimes the number of students visiting online platform is so large that lead to the collapse of the platform, which hinders the learning process of students [11]. PBL is an education model that requires group cooperation. It is very important for multiple students to discuss online at the same time. Technical problems may become the main barrier that prevents online PBL from being carried out.

Apart from technical problems, online PBL also has the challenges of online resources. Online resources are important for PBL students. In PBL, students change from passive receivers of knowledge to active explorers, and teachers are more inclined to guide them to learn. This change of identity requires students to actively seek learning materials. Online platforms provide the convenience of such demands of students. However, it does not mean all the materials are available and accurate. Taking Xuexitong as an example, the online platform has various functions like uploading audio, video, pictures, and other resources for students to self-study. The quality of these shared resources is uneven. According to the research of Guo and Liang, there are the following problems in Xuexitong: first, some resources are too basic to meet the needs of students for personalized materials; Second, there are too many unscreened and wrong materials, which waste the time of teachers and students. Thirdly, some resources cannot be downloaded because the platform is not compatible with some channels for downloading [12]. So the online platform workers should always pay attention to the needs and responses of teachers and students to constantly update the database, and collect the feedback of users so that solve problems accurately.

Furthermore, although online platforms can overcome geographical barriers and provide opportunities for students from different regions to team up and discuss, they cannot completely eliminate the physical distance between people. Even if people turn on the video and microphone for communication, what they can only see are people's facial expressions. If unfamiliar people cooperate, it is inevitable to have a sense of alienation, which will reduce students' enthusiasm to participate in the discussion [13]. Attention also depends on the environment. Most students participate in PBL via videoconference from their residences. This casual atmosphere is virtual for study which requires intense concentration. Students have difficulty focusing and maintaining attention in front of a screen. Students are also more likely to be distracted by people or events around them. Foo and Chu's research suggests that online platform use is associated with lower student engagement, lack of communication, and poor motivation [13]. But a good group atmosphere can increase students' enthusiasm to participate in cooperative discussions. According to Li's research, groups that treat each other with respect, are willing to listen, have clear goals, give feedback on time,

and distribute tasks fairly keep students motivated, while groups with unclear goals, shallow discussions, and slow behavior make students lose enthusiasm [14]. Therefore, the effectiveness of online PBL is dependent on the technology, electronic equipment, learning environment, the motivation of the group members, and the level of cooperation.

5. Conclusion

The topic of this paper is the effects of online PBL in Xuexitong. After the epidemic and the implementation of the double reduction policy, learning platforms like Xuexitong, which can conduct online PBL, are gradually becoming the mainstream learning method. The Xuexitong PBL module includes many useful functions such as forming a team, discussing problems in the comment area, sharing learning materials, and teacher assessment. It not only promotes students' problem-solving, time management, and cooperation skills but also satisfies the teacher's follow-up of students' group learning. But there are still some difficulties in online PBL mode such as network speed and stable connection problems. This article advocates for the implementation of Problem-Based Learning (PBL) in Xuexitong, a digital learning platform, as a beneficial approach for teachers and students who may not have prior experience with it. Additionally, it aims to provide support to those currently using PBL in Xuexitong by offering guidance on how to effectively utilize its functions, and addressing potential challenges that users may encounter. Finally, it is hoped that through this article, more people can understand, utilize, and enjoy the learning mode of online PBL through this function in Xuexitong, thereby promoting the use of the online PBL function.

Reference

1. Dost S, Hossain A, Shehab M, et al. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students[J]. *BMJ open*, 2020, 10(11): e042378.
2. Ng M L, Bridges S, Law S P, et al. Designing, implementing and evaluating an online problem-based learning (PBL) environment—A pilot study[J]. *Clinical linguistics & phonetics*, 2014, 28(1-2): 117-130.
3. Lu Xiaomin, Hao Ruifeng. Exploration on the complementary advantages of PBL pedagogy by online teaching platform[J]. *Education and Teaching Forum*, 2020(43):159-160.
4. Guo Fengtao. Research on the Application of Mobile Teaching App in Classroom Teaching in Colleges and Universities: A Case Study of Superstar Xuexitong[J]. *Science and Education Literature Collection(Second Issue)*, 2018(06):39-40. DOI:10.16871/j.cnki.kjwhc.2018.06.018
5. Wang Xibing, Wang Tan. Cooperative learning in colleges and universities based on Superstar Xuexitong: Advantages and paths[J]. *China Adult Education*, 2018, No.436(03):88-91.
6. Ma Hongliang, Yang Dong. Research on PBL model in network environment [J]. *Modern Educational Technology*, 2002, 12(3): 17-21.
7. Amissah P A K. Advantages and challenges of online project-based learning[J]. 2019.
8. Li Guilan, Chen Shuming, Li Baojun, Liu Ci, Liu Zhizong. Application of PBL+CBL teaching Method based on Learning Platform in the teaching of Animal Biochemistry in local agricultural colleges [J]. *Science and Technology Information of Animal Husbandry and Veterinary Science*, 2022(09):7-9.
9. Cheaney J D, Ingebritsen T. Problem-based learning in an online course: A case study[J]. *The International Review of Research in Open and Distributed Learning*, 2005, 6(3).
10. Gan Qing-jun. Research on Hybrid Teaching Mode based on Hyperstar Learning Platform -- Taking "Product Design Software Application (Engineering Design)" course as an example [J]. *Education and Teaching Forum*, 2022, No.602(51):141-144.
11. Wilcha R. Effectiveness of Virtual Medical Teaching During the COVID-19 Crisis: Systematic Review[J]. *JMIR Med Educ* 2020;6(2):e20963
12. Guo Zhongzheng, Liang Ling. Based on "super star learning through" digital resources online language requirement analysis [J]. *Journal of horizon of science and technology*, 2021, No. 341 (11) : 77-80. The DOI: 10.19694 / j.carol carroll nki issn2095-2457.2021.11.32.
13. Foo, Cc., Cheung, B. & Chu, Km. A comparative study regarding distance learning and the conventional face-to-face approach conducted problem-based learning tutorial during the COVID-19 pandemic[J]. *BMC Med Educ* 21, 141 (2021).
14. Li, A., Bilgic, E., Keuhl, A. et al. Does your group matter? How group function impacts educational outcomes in problem-based learning: a scoping review[J]. *BMC Med Educ* 22, 900 (2022)