

# Action Research for Using Problem Based Learning in Adult Education

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## ABSTRACT

The study is a case study based on action research, under the process of Problem-Based Learning (PBL), to explore if it is able to promote learners' self-learning, problem-solving, and capacity of specialty, meanwhile, to exam how much, through rethinking process of action research, teachers able to improve their teaching methods when obtaining feedback from the learners. The participants are adult students who major in financial management and enroll in continue education in a University. Two kinds of questionnaires are mainly used to collect data. The first one is to assess the participants' learning effectiveness (compulsory subjects). The other is to survey students' satisfaction when teachers using PBL as teaching method. The study found that PBL is used as the medium of instruction during the courses. The students act in the beginning as passive listeners but gradually turn to be active problem solvers. Besides, their learning results show remarkable progress in three dimensions of financial professional fields. Namely, students get obvious effectiveness and promote their professional capacity. In addition, students' learning effectiveness will encourage teachers to improve their teaching materials and skills. Furthermore, the teachers will respond to course design and implement them with teaching experiences in the future.

**Keywords:** *problem-based learning, action research, adult education, financial management class*

## 1. INTRODUCTION

As far as we know, the majority of adult students who enroll in continued education already have been working for years. Some of them have achieved higher career levels or start a family. They have their personal experience in financial knowledge or management. Although they return to school to be students again, they still are eager to express themselves. So, using problem-oriented learning strategy will arouse more echoes? Will it achieve better results from teaching? This study aims to explore between students and teachers by using problem-based learning to see if it leads to mutual participation of everyone rather than the traditional teacher's sole teaching. The PBL teaching method makes the classroom not only one teacher's lecture, but everyone actively participates in learning. Under the implementation of PBL, teachers merely play the role of a guide to summon students being in classes, to make learners improve self-learning capability and to mix past experience and new knowledge. During the process of problem-solving, learners integrate their experience and new knowledge which they obtain in class, and finally internalize them into their skills.

Action research methods are widely used in educational research. This study uses action research, through the integration of PBL teaching and situational cases into the adult continuing education, and explores the learning effects of students by means of planning, action, observation and reflection. This study intends to use PBL

as the main axis of curriculum implementation and to enhance the discussion and participation of adult students in the classroom through innovative teaching methods. The results will verify the effectiveness of PBL if it is suitable for adult learners.

## 2. LITERATURE

Action research is a way of combining the wisdom and abilities of scientific researchers and practical workers, emphasizing the cooperation between practical workers and academic researchers in order to shorten the gap between theory and practice. At the same time, it satisfies the needs of both parties in improving practical social problems [4]. One of the most basic motivations of action research is dedicated to improving the dilemma of teaching and learning, which stems from practical problems that arise in daily educational work. Action research supports teachers to effectively respond to teaching difficulties and challenges, and ultimately innovate teaching work through the process of reflection and thinking [1]. The action research process includes diagnosing problems, identifying problems, planning strategies, taking actions, evaluating and reflecting [5]. Problem based learning (PBL) is currently widely used in various education fields. PBL takes students as the center of learning. In the teaching process, teachers use practical problems as the core of teaching and group discussion as a means to cultivate ability to learn independently, think critically, and solve problems. Therefore, the goal of PBL

is to be able to learn, and to learn that only knows. Barrows [2] believes that PBL emphasizes active learning and self-direction. When students understand the problem, they will know what to learn. Through PBL teaching, students learn to be responsible for themselves, build confidence in expressing opinions, listen to the opinions of others, and actively search and verify information. At the same time, they also promote the learning of others. Duch [3] research results showed that PBL teaching enables students to have the ability to criticize and speculate, to solve complex problems, to use appropriate learning resources, to demonstrate effective communication skills, and finally to internalize knowledge and become lifelong learners. Smith, M. K. [6] developed the theory of andragogy is the theory specifically for adult learning. Adult learners are self-directed and expect to take responsibility for decisions. Adult learning programs must accommodate these fundamental aspects. Therefore, based on the andragogy theory of Smith, M. K., this article uses PBL as the operating instrument and action research as the research methodology to explore the learning effects of adult students.

### 3. RESEARCH DESIGN AND METHODOLOGY

This study uses action research as a research method. The teaching design is based on the perspective of the teacher as the researcher. The curriculum adopts problem-oriented teaching implementation. Authentic cases are taken as teaching materials. Questionnaires are designed as a tool to collect data. Through the collection and analysis of data, teachers/researchers are guided to propose corrections and feedback to complete the action research process. The participants are adult students taking the course of "Wealth Management Practice" in a university. There were originally 20 students in the course but 2 students dropped out during the semester. 18 students participated in completing the course. There are 10 females and 8 males. The age distribution is 2 people (11%) under 26 years old, 5 people (28%) between 26-35 years old, 6 people (33%) between 36-45 years old, and 4 people (22%) between 46-55 years old. One person (6%) is over 56 years old. This study draws up a plan based on teaching philosophy and teaching goals. The main implementation time of the research is class time. The action strategies of this plan are as figure 1.

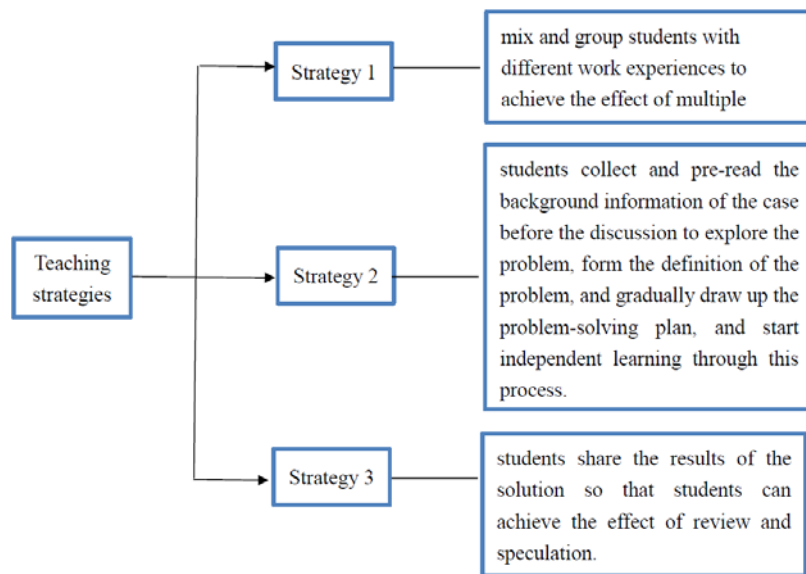


Figure 1. Action Strategies of Plan

Two questionnaires are designed as tools to collect data. The first questionnaire focuses on the extent of students' learning satisfaction, which is conducted after finish PBL teaching. The questionnaire was reviewed by experts and peers to confirm the validity of the content. This study uses Cronbach's  $\alpha$  as a measure of reliability. The  $\alpha$  coefficient of the questionnaire is 0.74, showing that internal consistency is sufficient to support the research results. The second questionnaire is the measurement of professional learning effects. It is conducted through pre-test and post-test to measure the effect of professional

learning before and after the implementation of the PBL. The questionnaire is reviewed by financial experts and scholars to confirm whether the questionnaire is logical and reasonable, and to verify its validity. The questionnaire uses Cronbach's  $\alpha$  coefficient as an indicator of reliability. There are 34 questions in the questionnaire, with a total  $\alpha$  coefficient of 0.75, which shows that the questionnaire is stable enough to support the conclusion of this research.

## 4. RESULT AND DISCUSSION

After the questionnaire surveys are collected, a statistical analysis such as the percentage, average, standard deviation, and difference analyses are performed. The research results and feedback analysis are discussed as follows.

### 4.1. Professional Learning Effectiveness

In order to understand the professional learning effects of PBL teaching on adult students, pre-tests are given to students at the beginning of the course, and post-tests are conducted before the end. Questionnaires are used to investigate the effectiveness of students' professional learning, and the questionnaires use a five-point scale. The content of the questionnaire is divided into three parts.

The first part is about students' knowledge and skills in wealth management, with 16 questions. The second part is a survey of students' cognition of financial commodity knowledge. There are 11 questions in total. The third part has 8 questions to measure whether students can understand investment principles and apply them to investment management in financial planning. The average of the measurement is analyzed by the difference test. The results show that the students have made significant progress in learning for three measurement items, as shown in Table 1. The evaluation is based on the three dimensions of professional knowledge, and the averages of the post-test are greater than the averages of the pre-test. After the difference test, the averages between the post-test and the pre-test reached a significant level ( $p < .001$ ). The research results confirmed that PBL teaching integrated into situational cases has significantly improved the effectiveness of professional learning.

**Table 1.** Effects Analysis Before and After Learning

Measurement dimension	Before/ After	Average	Standard deviation	t-Value	Significance (P-value)
Wealth management knowledge	Before After	3.18 4.35	0.48 0.16	-12.35***	<.001
Awareness of financial products	Before After	2.82 4.35	0.33 0.05	-17.40***	<.001
Understanding of investment principles	Before After	2.54 4.24	0.34 0.13	-21.39***	<.001

\*\*\*  $P < 0.001$

Compared with other business courses, financial courses are more difficult, have a lot of theoretical content, and require calculation and derivation. Students usually have to endure this boring learning process. It is even more difficult to transform knowledge into their skills from the learning process. The analysis of the questionnaire revealed as followings:

- (1) Wealth management knowledge: The results found that the cognition of financial planning for students has improved a lot, especially those related to personal or family budgets, savings management, and asset allocation, which are all topics related to personal life.
- (2) Awareness of financial products: Students have made the most progress in cognition of common financial products, such as insurance, funds, exchange rates, stocks, etc., which may be because these financial products are usually easier to access, thus strengthening the cognition for these products. In contrast, students have made little progress in index funds or derivatives.
- (3) Understanding of investment principles: The analysis results show that the difference between the pre-test and the post-test reached a significant 1.70, which is the biggest difference among the three dimensions,

and represents the dimension where students have made the most progress.

The above analysis shows that by integrating PBL into teaching, adult learners can achieve significant progress in professional learning.

### 4.2. Learning Satisfaction

After the implementation of PBL, a questionnaire will be given for class satisfaction. The design of the questionnaire uses a five-point scale. The questionnaire was tested in class, and those who were absent from the test were also supplemented with the questionnaire, so the recovery rate was 100%. The results of the PBL satisfaction survey are shown in Table 2. This study shows that 80% of students think they are very satisfied with PBL. However, only 50% of students are very satisfied with the improvement of their expression ability, and 50% are fairly satisfied. When thinking about the implementation of PBL, the teaching progress was indeed delayed due to the enthusiasm of discussion, and it was impossible for every student to give an oral presentation. This shortcoming needs to be overcome when applying PBL in the future.

**Table 2.** Satisfaction Analysis of Problem Based Learning

Performance of PBL	Very satisfied	Satisfied	Fairly	Unsatisfied	Very unsatisfied
1. More interesting than traditional lectures	89%	11%	0%	0%	0%
2. Enhance learning interest	83%	17%	0%	0%	0%
3. Improve problem-solving ability	83%	11%	6%	0%	0%
4. Strengthen the self-learning attitude	89%	11%	0%	0%	0%
5. Optimize expression ability	50%	50%	0%	0%	0%
6. Improve team ability	83%	17%	0%	0%	0%
7. Increase human relationship	89%	11%	0%	0%	0%
8. Increase motivation to participate	72%	28%	0%	0%	0%

This research also evaluates learning performance for self-satisfaction. The evaluation results are shown in Table 3. The survey results show that 89% of students get substantial help from their studies. 67% of the students said that the design of this course will help them improve their workability, and even 83% of the students stated that this course will make them more confident in using new knowledge in their work.

There are two summative assessments in the satisfaction survey. 18 students who participated in this course completely gave 100% affirmation, as shown in Table 4. It means that the results of implementing PBL in this course are positively affirmed by students. In the PBL guided learning process, students are satisfied with the overall teaching process.

**Table 3.** Analysis of Student Self- Assessment

Assessment item	Very satisfied	Satisfied	Fairly	Unsatisfied	Very unsatisfied
1. I think this course is really helpful to me	89%	11%	0%	0%	0%
2. This course helps to improve your working ability	67%	28%	6%	0%	0%
3. Have more confidence in applying the new knowledge learned at work	83%	11%	6%	0%	0%

**Table 4.** Analysis of Summative Assessment

Overall course performance	Very Agree	Agree	Normal	Disagree	Very disagree
4. Overall, I am very satisfied with the results of this course.	100%	0%	0%	0%	0%
5. Overall, I am very satisfied with the content and teaching methods of this course.	95%	95%	0%	0%	0%

## 5. CONCLUSION

This study uses problem-based learning as the teaching method, the participants as student-centered, and problem-solving as the main learning process. Therefore, the participants not only learn through a new way but also the researcher improves the teaching skill. The conclusions can be divided into two aspects: student learning effectiveness and teacher teaching reflection. The two conclusions are as follows

### 5.1. Learning Effectiveness after PBL

In terms of student learning effectiveness, based on the design of the curriculum, when the participants take the difficult financial theory, they would be able to understand practical case study and go future discussion. The PBL

stimulates the participates' motivation and interest in learning. M.S. Knowles indicated that adult learners who tend to be self-directed, are able to make decisions for themselves, and hope to be treated as mature individuals. The study found that participants' learning attitudes have changed significantly to positive and self-directed. This conclusion echoes the theory of adult education proposed by M.S. Knowles. Moreover, M.S. Knowles stated that the learning orientation of adults is life-centered and problem-centered. The autonomous learning that is emphasized by PBL is very suitable for adult education. The results of this study also show the learning outcomes of adult learners through PBL.

### 5.2. Reflection after Teaching Practice

In terms of teachers' reflection, teaching activities are not only a manifestation of external behavior, but also a portrayal of internal consciousness. After the action

research of problem-oriented teaching, the effectiveness of students' learning is the greatest motivation and support for teachers to innovate and change. Researchers/teachers perceive their professional knowledge, teaching philosophy, and behavioral value through action-reflection. After considering the characteristics of learners, assess whether the teaching design and action strategies adopted are appropriate and whether they correspond to the originally set teaching philosophy and teaching goals. Through these reflections, the factors that affect the quality of teaching can be detected. However, it is difficult for teachers to initiate a conscious awareness of teaching practice. Each teaching design and preparation must consume a lot of time. The planning action process must continue to interact with students and make adjustments according to the students' learning conditions, which are more time-consuming and labor-intensive than ordinary courses. If there is no external pressure or assistance, most teachers would rather choose traditional teaching methods. Therefore, it is necessary to give teachers appropriate incentives and encouragement to make them willing to innovate teaching.

### **5.3. Suggestions for Future Research**

This study verified that the PBL teaching method has achieved significant results in small classes. The success of PBL depends on the improvement and skillful designs in teaching materials. Therefore, the learning effectiveness

of designed teaching materials will provide useful insights for PBL in future research.

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