Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

Development of an instructional model for the investigation and inquiry course using problem-based learning

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ARTICLE INFO

Article history:
Received 23 December 2024
Received in revised form
24 April 2025
Accepted 28 April 2025

Keywords:
Problem-based learning
Learning management model
Criminal investigation
Academic achievement
Student satisfaction

ABSTRACT

The aim of this study was to develop a problem-based learning (PBL) management model for law students enrolled in the Criminal Investigation course at Mahasarakham University during the second semester of the 2022 academic year. The sample group included one classroom of 30 students, selected through purposive sampling. The PBL approach was implemented over a total of 12 hours. The research tools consisted of a problem-based learning plan focused on special criminal case investigations, an achievement test, a satisfaction questionnaire on PBL, fieldwork logs, and student interviews. The study followed a one-group pretest-posttest experimental design. Data were analyzed using mean scores, standard deviations, t-tests for dependent samples, and developmental score calculations. The findings indicated that the effective learning management model included five main steps: (1) identifying the problem, (2) understanding the problem, (3) researching and exploring, (4) analyzing and synthesizing the problem, and (5) concluding and presenting the solution. The results showed that students who participated in the PBL approach demonstrated a statistically significant improvement in their academic achievement at the 0.01 level. The average developmental score was 58.40, which is considered high. Student academic performance was rated as 'good,' and their satisfaction with the learning process was also at a high level ($\bar{x}$ = 4.32). Additionally, students reported feeling more engaged, motivated, and confident in expressing their ideas.

1. Introduction

Most law schools in universities rely on conventional methods of passing knowledge from teachers to students, which are mainly lecture-based methods or large-group seminars covering details of statutes and court decisions (Mahmood et al., 2023). However, at present, the faculty of law in many countries has adopted new instructional methods. One of them is problem-based learning (PBL), which has been applied and integrated with other methods in different courses. PBL has promoted students' shift of knowledge structure and attitude. Moreover, there is a strong drive for drastic changes in education and learning (Glazewski, 2019). Legal and academic knowledge may not be the goal of legal education for the new generation of lawyers. Instead, intelligence and the ability to apply knowledge successfully in different practical contexts are more important. Student-centered PBL is an important strategy of legal education that focuses on the student's future. PBL promotes students' freedom of thinking, self-confidence, and ability to work with other people as well as to solve legal problems in the future (Kurtz et al., 1990). Moreover, a comparison between conventional instructional methods and PBL proves that the latter yields more benefits for students than the former. In other words, PBL promotes lifelong learning skills among new generations of lawyers, who develop better critical thinking skills and problem-solving skills. In the future when they are faced with unexpected daily situations, they can solve related problems efficiently (Shalini, 2021). PBL stems from medical education whereby students are divided into small groups to analyze and to diagnose patients. PBL focuses on problem analysis rather than problem solutions. PBL promotes communication and teamwork, which bridges the gap between theoretical and practical learning. Also promoted are self-study and cooperation between groups of students through their reflections on learning quality assurance. This learning strategy is appropriate for

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professional education including legal education. PBL is appropriate for lawyer practice education (Rué et al., 2013). PBL helps students gain first-hand working experience, which is the closest to the actual working situation. It is generally known that to perform their duties, an actual lawyer needs to conduct a lot of research as well as integrate their legal knowledge with other sciences. Nevertheless, PBL has some drawbacks both in theory and in structure (Sheppick, 2024). Although problem-based learning activities are better than traditional classroom techniques, the impact of implementing such methods must be considered in many areas (Oliveira et al., 2022).

Based on this, the researcher considered it appropriate to apply Problem-Based Learning (PBL) to the teaching of the subject Investigation and Inquiry, which integrates legal theory with practical skills. However, this teaching approach is still relatively new in the context of legal education in Thailand, where traditional classroom lectures remain the main method of instruction. Therefore, before introducing PBL to students, it is important for education experts to carefully analyze and design a suitable PBL approach that aligns with the nature and objectives of this subject.

This research is an operation to produce a problem-based teaching model appropriate for the investigation course. The objectives are as follows:

- To analyze, synthesize, and evaluate the format of problem-based learning during investigation and inquiry.
- To study the effects of problem-based learning on academic achievement and student satisfaction during investigation and inquiry.

Legal education in Thailand should be based on a large variety of instructional methods and meet international standards. It should not rely on classroom-based lectures only and assessment should not be based on final exams only. In the process of model development: Model development experts are university lecturers with more than five years of teaching experience, holding at least a doctorate degree or equivalent, and holding the academic ranking of at least assistant professor. A specific group of samples has been selected. There are altogether five persons.

Scholars who assess the instructional model are university lecturers with more than five years of law teaching and assessing experience, holding at least a doctorate degree or equivalent, and holding the academic ranking of at least an assistant professor. There are altogether five persons.

In the process of implementation or deployment: The sample consisted of 200 third-year undergraduate students from the Faculty of Law, Mahasarakham University, who were enrolled in the Investigation and Inquiry course during the second semester of the 2022 academic year. Using purposive sampling, a total of 30 students were selected, all of whom intended to pursue a career in law enforcement after graduation. The problem-based learning approach in the course on investigation and inquiry arises from the analysis and synthesis of information by experts through small group meetings. The analysis of the format's appropriateness was conducted using a questionnaire as a tool. Once an appropriate format was determined, the researcher implemented the analyzed, synthesized, and evaluated format with the sample group to determine the learning outcomes from the achievement test and to assess the students' satisfaction through a satisfaction questionnaire.

2. Literature review

Problem-Based Learning (PBL) is a student-centered approach that uses real-life problems as a basis for learning. It aims to develop critical thinking, problem-solving, communication, and lifelong learning skills. PBL can be used not only as a teaching method but also as a framework for curriculum design. Unlike traditional teaching, PBL emphasizes practical application and group collaboration, which helps students actively engage in the learning process and work together to find solutions. In this approach, the teacher takes on the role of a facilitator, guiding students rather than directly instructing them (Ali, 2019). This differs from traditional teaching methods where the instructor acts as the primary transmitter of knowledge to the students. In PBL, the process starts with students understanding a problem and then seeking knowledge that can be applied to solve it. Thus, students play an active role in the learning process. In contrast, traditional teaching methods might focus mainly on students' ability to memorize course content (Dolmans et al., 2010). Learners were improving analytical thinking, and decision-making (Sungur and Tekkaya, 2006). When comparing PBL to Traditional Law Teaching, Law young men and women, before graduating and entering the workforce, spend typically, 90% reading and grasping legal texts and dissecting court rulings from various cases. But just doing this is not enough for them to address the complex problems they might encounter in their future work. This leads to the consideration of how students can effectively apply what they have learned without resorting to a time-consuming process of trial and error (Wong, 2003). Legal education at the undergraduate level should emphasize providing students with a foundational understanding of law and various subjects to lay the groundwork for applying knowledge in line with the real world. It is crucial to encourage learners to become critical thinkers who actively contribute to driving society forward. Moreover, education should prioritize producing legal experts who are immediately capable of practicing in their field. In addition, with the advancements in technology today, the next generation of lawyers will have to adapt and develop their learning skills to be more comprehensive. Especially in countries using the

traditional legal education system of sitting in large classrooms listening to a lecturer, then testing what they recall with an examination. With this classroom management style, students are to lack many skills, such as skills in working with others, systematic analytical thinking, and presenting and giving reasoning in legal matters critically (Carpenter, 2020). PBL thus serves as an alternative method to enhance various skills for students, leading to improved learning outcomes. Examples can be seen in several subjects within the law curriculum, including contract law, tax and duty law, and constitutional law, to name a few (Shalini, 2021).

Legal education plays a crucial role in promoting sustainable development. Because, in the future, legal experts will play a key role in shaping important regulations and policies. That addresses global challenges, particularly those related to economic and social sustainability (Jekabsone and Ratniece, 2023). Therefore, there is a need to develop new teaching models and methods to respond to changes. The integration of technology, including teaching methods like PBL, which helps develop critical thinking skills, into the educational process. That may help learners understand legal issues and find appropriate solutions to problems. The distinctive feature, which emphasizes group work, helps analyze and find solutions for each case study. It will help learners gain a variety of perspectives. It also integrates legal knowledge with learning skills in various other areas (Morska et al., 2024).

To make PBL (Problem-Based Learning) an educational innovation in law that responds to learning in the 21st century, it may encounter challenges, including limitations in various aspects (Segarra, 2020). The main challenge is the preparation of the instructors, which requires a shift from being a lecturer to being a designer and planner. Additionally, instructors must create a system or mechanism to support the stimulation of critical thinking through group work among students, who may be more accustomed to being good listeners rather than active participants in activities. Furthermore, the issue of time and resource management arises, especially in law faculties with many students. PBL may lead to limitations because it requires appropriately sized special classrooms. Additionally, there must be sufficient budget and personnel, which may result in some instructors being unwilling to use PBL in teaching and learning.

The assessment and evaluation methods also present another challenge (Nguyen and Vu, 2024). This is because PBL is an activity that requires collaboration from all parties involved. In the case of students, in addition to increasing responsibility, students will also take on multiple roles. Meanwhile, instructors themselves will need to put in significant effort to manage students' grades (Houghton, 2023). All of this does not even include the many problems and obstacles in implementing PBL in practice.

3. Data analysis

To identify a common theme, data analysis is based on in-depth interviews, content analysis, and details of interviews by key informants. Analysis of data on appropriateness questionnaires is based on analysis of opinions and recommendations by scholars on synthesized models. The data is then interpreted accordingly based on a scale of five levels. The results are as follows:

- Average of 4.51–5.00 means most appropriate
- Average of 3.51–4.50 means very appropriate
- Average of 2.51–3.50 means appropriate
- Average of 1.51–2.50 means slightly appropriate
- Average of 1.00–1.50 means least appropriate

The analysis of academic achievement tests commences with the researcher formulating a problem-based learning plan centered on specialized criminal investigation topics. This plan spans 12 hours and is distributed over 6 weeks. To gather data, various tools, including academic achievement tests, are employed. The test consists of 30 multiple-choice questions, each offering 4 options. The difficulty value of the questions ranges from 0.39 to 0.66, the discriminatory power value is 0.26 or higher, and the test boasts a reliability value of 0.72.

Data analysis to compare academic achievement in special criminal investigation matters. The method is as follows:

1. Find the average and the standard deviation of the scores from the achievement test of the study sample group.
2. Test the difference in the average scores of academic performances of students who studied before and after using a statistical test for dependent or paired samples (t-test dependent group).
3. Analyze data to study the developmental progress scores of students who have received problem-based learning interventions.
4. Calculate developmental progress scores from the pre-learning and post-learning academic performance test using the developmental score formula and translate the scores into developmental level criteria (Table 1).

Table 1: Development scoring criteria compared to development levels

Growth score	Developmental level
76-100	Highly advanced development
51-75	Advanced development
26-50	Moderate-level development
0-25	Basic development

5. Data analysis to study the level of learning effectiveness in the subject of investigation and inquiry. To assess the level of learning effectiveness in the subject of investigation and inquiry, data analysis is conducted using specific measurement and evaluation criteria. Academic performance is categorized based on percentage

scores. A score between 80–100% indicates excellent academic performance. Scores from 75–79% reflect very good performance, while those between 70–74% signify good performance. A percentage range of 65–69% is considered fairly good, and 60–64% is categorized as satisfactory. Scores from 55–59% denote adequate academic performance, and 50–54% reflect performance that meets minimum academic standards. Any score below 50% indicates low academic performance.

6. Compare the scores obtained from the academic achievement test. The scores obtained from the academic achievement test are compared against the evaluation criteria to interpret performance levels. A score of 27–30 reflects excellent academic performance. Scores between 25–26 are considered very good, while 23–24 indicate a good level. A score range of 21–22 is interpreted as fairly good. Performance is deemed satisfactory with scores of 19–20, and adequate at 17–18. Scores from 15–16 indicate that the performance meets minimum academic standards, while scores between 0–14 are classified as low academic performance.
7. Analyze data to study satisfaction with learning management by finding the average ($\overline{x}$) and the SD from the scores obtained from the satisfaction survey in the learning management of students who are taught using a problem-based approach. The results are evaluated based on the following criteria:

- Average score of 4.51-5.00 means Highly satisfied
- Average score of 3.51-4.50 means Very satisfied
- Average score of 2.51-3.50 means Moderately satisfied
- Average score of 1.51-2.50 means Slightly satisfied
- Average score of 1.00-1.50 means Least satisfied

8. Analyze data from the field record form and the student interview form, using the data obtained from observing learning behaviors, and the student interviews, to analyze and synthesize the results, and present them in a narrative form.

Focus group discussions among model experts are based on in-depth interviews. The researcher collected all the data themselves. The researcher contacted model experts; made appointments with a specific time, date, and venue; and conducted the interviews themselves with open-ended questions covering four aspects: preparation, learning facilities, classroom management, and assessment/evaluation.

4. Data analysis and interpretation

Data on opinions and recommendations by five experts has been analyzed. Results show that an appropriate model of PBL for the Investigation and Inquiry Course should be based on four components. Details of each component of the PBL model in the Investigation and Inquiry Course are shown in Fig. 1.

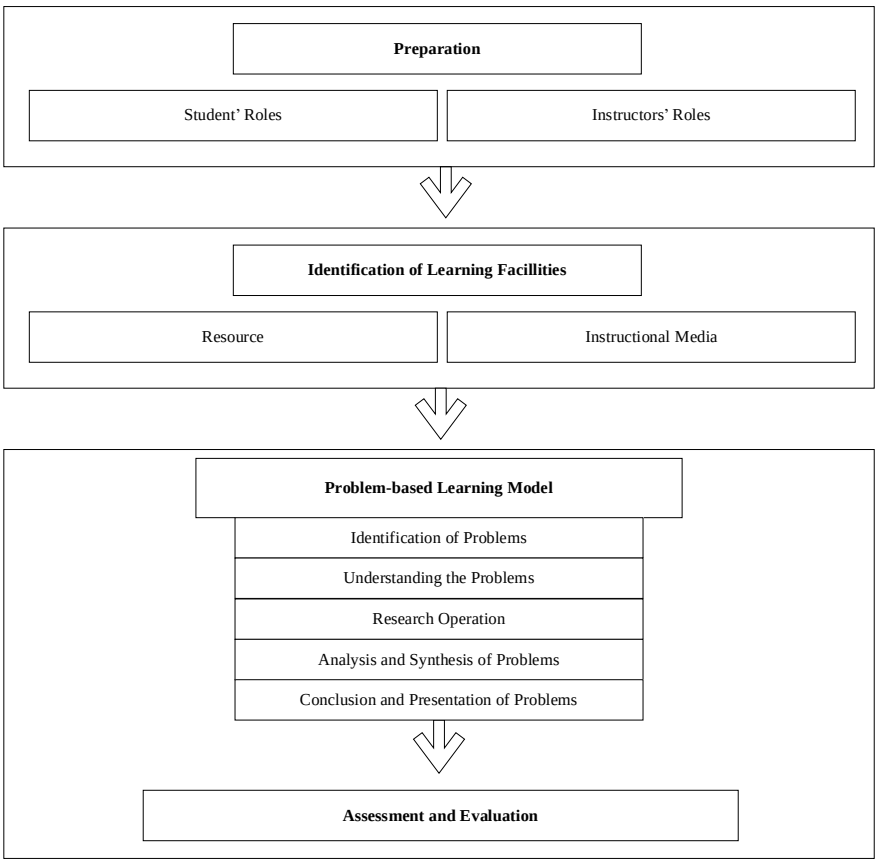

Fig. 1: Problem-based learning approach that arises from the process of analysis and synthesis

4.1. Component 1: Preparation

Before the start of PBL, it is necessary to determine students' and instructors' roles in compliance with the new instructional model in legal education that is supposed to meet the standards required by professional bodies.

Students: To make the students ready for PBL, it is necessary to determine students' roles under the new instructional model, which starts with the identification of problems to be studied. Identification of problems stems from students' reflection on problematic issues, their needs, and their interests, therefore, instructors' roles are very limited. This is quite different from the conventional lecture-based method. Consequently, students are not supposed to just attend lecture-based classes and wait for final examinations, instead, they are required to play an active role in classroom activities, like acting as state employees performing their investigation and inquiry duties. To be successful in their classroom performances, students are required to possess knowledge of theories and have a good understanding of principles and methods in practice. They should also understand the legal conditions that give authority to state employees. Moreover, students should know the mechanisms to scrutinize the state power exercise. All this knowledge can help them prepare themselves for future careers. After identifying problems, students will 1) gain interest, 2) explore and research, 3) be able to give explanations, 4) extend their knowledge, and 5) be able to assess their own learning outcomes by themselves.

Instructors: They should understand PBL thoroughly and be able to apply instructional methods that accentuate students' roles. Instructors should play the role of facilitator and prepare all related documents that cover all theoretical content so that students can have a learning manual to consult or rely on. Instructors should be good listeners and decide the classroom activities to promote students' new knowledge learning.

4.2. Component 2: Identification of learning facilities

Resource: There should be different sources of news, databases, information, and experiences that encourage students to gain new knowledge by themselves progressively. Resources should promote students' learning process. They are vital for learning management for students. Management of resources includes involvement with different people, venues, agencies, and organizations. Both students and instructors should have access to different sources of data, such as research for related information on websites via the Internet including research and academic papers.

Media: There should be different channels for disseminating knowledge, skills, and experiences from resources to students. Media can ensure better efficiency of learning than passive lectures. Instructional media refers to everything available in the immediate environment. For example, social media makes it possible to transfer knowledge on investigating and inquiring techniques from experts, or first-on experiences from practicing state employees or formerly prosecuted persons to students. Other media include movies, TV series, and news reports on investigations whether ordinary or special investigations.

4.3. Component 3: PBL model and management plan

1. Identification of Problems: In this step, students and instructors will sit in a discussion under the scope of the subject. To ensure accurate problem identification, problems shall be identified only after students reflect on their needs and their interests.
2. Understanding Problems: Instructors shall pose some questions that arouse students' interest and eagerness to find answers. Students shall be then engaged in discussing problematic situations designated by instructors. Then students are supposed to draft an outline of the thinking process as well as an operation plan to be implemented accordingly.
3. Research Operation: Instructors are to divide students into small groups. Also to be determined are the separation of works and duties, priority of works, identification of targets as well as timeline for research and data record.
4. Analysis and Synthesis of Problems: Instructors are to pose some questions that help students acquire concepts of their work as well as enable students to present their newly gained knowledge in a wide range of situations. As supervisors, instructors should be able to verify the accuracy of each topic and issue.
5. Conclusion and Preparation of Problems: Each group of students can make their own choice of presentation methods. To promote further discussion among students, each group can discuss and express their opinions freely.

4.4. Component 4: Assessment and evaluation

In this step, students will be assessed and evaluated. The most important criteria are the new knowledge gained from their participation in each activity, compared to the designated standards of the course. The goal is to decide whether students achieve the goals of the course or not. Therefore, there should be a large variety of assessing and evaluating methods. For example, students should be assessed and evaluated from their learning in actual context. Based on students' participation, there should also be tests, interviews, and forms of expected behavior among students.

Table 2 shows that after a thorough synthesis of the learning model, scholars conclude the level of appropriateness of applying PBL into the Investigation and Inquiry Course is very appropriate

as $\bar{x}$ = 4.19. Scholars also recommend instructors consider the nature of each course before applying for PBL. When the format for organizing teaching and learning had been obtained, the researcher proceeded to develop a learning management plan. This involved studying content from lessons about investigation and inquiry, specifically regarding the measures and methods used in criminal case investigations. After analyzing and segmenting the content, it was then used to design and create various scenarios. Alternatively, real-life situations that align with the content were also used. These were presented as problem situations, allowing students to practice their problem-solving skills to find genuine solutions.

Table 2: Scholars ' assessment of appropriate PBL model in investigation and inquiry course

Components	Results		Level of appropriateness
	$\bar{x}$	SD	
Preparation	4.28	0.57	Very appropriate
Learning Facilities	4.20	0.70	Very appropriate
Learning from PBL	4.10	0.55	Very appropriate
Assessment and Evaluation	4.20	0.57	Very appropriate
Total	4.19	0.59	Very appropriate

SD: Standard deviation

The details of the learning plan can be divided into five steps.

- Step 1: Problem Definition (Week 1): Before commencing the process of defining the problem, the instructor will provide an overview of the problem-based learning framework. This will be presented to a target group comprising 30 enrolled students in the Investigation and Inquiry course. Additionally, there will be opportunities for students to meet, engage in conversations, and exchange their learning experiences with their peers. Furthermore, the instructor will elucidate the course's content scope within the topic of 'Special Characteristics of Criminal Investigation Methods,' granting students the autonomy to select topics aligned with their preferences. The course will encompass acquiring measures and methods for investigating distinctive attributes of criminal cases through five different approaches, namely wiretapping, electronic surveillance, controlled delivery, undercover operations, and entrapment. Subsequently, the instructor will evaluate the students through a performance assessment test consisting of 30 questions, which has been developed by the instructor.
- Step 2: Understanding the Problem (Week 2): When the topic arising from the learners' needs has been identified, the teacher will pose questions to encourage learners to generate thoughts on the topics they want to know. For example, what does this method entail? In which legal regulations do they appear? Who is designated as the authority to utilize such methods? And when it's time to implement this method, what kind of issues might arise? In this case, the teacher will encourage each learner to think independently, create a diagram during the thought process, and manage the planning process to translate it into action.
- Step 3: Conduct research and exploration (Weeks 3-4): The instructor will divide the students into six groups, with each group consisting of five individuals. In each group, there is one high-achieving student, three individuals with average abilities, and one student with lower proficiency. Each group of students will need to select a chairman, vice-chairman, and secretary for the group, and specify the roles and responsibilities of each person clearly. There will be a rotational system where the roles of chairman, vice-chairman, and secretary will be exchanged among the group members. According to the topics of investigation for special criminal cases,
- The instructor will explain the characteristics of the learning process, and each student will need to collaborate to research information related to various investigative methods from sources including books, articles, and internet resources, as well as from movies, TV series, or relevant social media. Afterward, they will exchange their opinions with each other. The instructor has set a two-week study period, along with assigning each group to compile a summary report on their respective topics.
- Step 4: Analyze and Synthesize the Problem (Week 5): The instructor has invited members of each group for interviews to stimulate critical thinking using specific questioning techniques and by having each member in each group explain the overall process of investigating criminal cases in various formats. The results from data analysis of cases they have studied should be presented in an organized and systematic manner to communicate comprehensively and diversely to others. The instructor will assist in verifying the correctness and suitability of each topic.
- Step 5: Summarize and present the issues (Week 6): Each group will be required to present and summarize their major findings on important topics. Each group should not exceed ten minutes. This is to promote mutual knowledge exchange among class members. During the teaching process, the researcher uses a recording form to collect data on the learning behaviors of the learners and to document various events that occur. When the scheduled learning management is completed, the researcher conducts a learning management test with the learners using a performance assessment test created by the instructor, consisting of 30 items and then compares it with the results of the pre-learning assessment scores.

The scores from the pre-learning test yielded an average of 13.10, with an average percentage of 43.67%. Out of these scores, only 6 students surpassed the 50% mark, representing 20%. Therefore 24 students, which is 80% of the total, did not reach the 50% threshold. In contrast, scores from the post-learning test showed a significant improvement, with an average score of 23.07 and an average percentage of 76.90%. Notably, every student scored above 50% in the post-learning evaluation shown in Tables 3 and 4.

Table 3: Exam scores before and after implementing problem-based learning

Person	Pre-learning score	Post-learning score	Proficiency level	Difference score	Developmental proficiency score
1	13	24	Good	11	64.7
2	12	19	Satisfactory	7	38.9
3	14	23	Good	9	56.3
4	8	22	Quite good	14	63.6
5	10	24	Good	14	70
6	18	24	Good	6	50
7	11	25	Very good	14	73.7
8	10	22	Quite good	12	60
9	13	24	Good	9	64.7
10	11	24	Good	13	68.4
11	9	19	Satisfactory	10	47.6
12	14	23	Good	9	56.3
13	17	25	Very good	8	61.1
14	21	27	Excellent	6	66.7
15	13	22	Quite good	9	52.9
16	12	18	Acceptable	6	33.3
17	11	24	Good	13	68.4
18	13	23	Good	10	58.8
19	14	24	Good	10	62.5
20	12	24	Good	12	66.7
21	10	20	Satisfactory	10	50
22	13	19	Satisfactory	6	35.3
23	14	25	Very good	9	68.8
24	12	24	Good	10	66.7
25	14	25	Very good	11	68.8
26	13	23	Good	10	64.7
27	11	25	Very good	14	73.7
28	17	24	Good	7	53.8
29	18	25	Very good	7	38.9
30	15	22	Quite good	7	46.7
Average	13.1	23.07		9.76	58.40
Percentage average	43.67	76.90			

Table 4: Comparing academic performance before and after studying

Test	Maximum score	N	$\bar{x}$	$\bar{x}$ percentage	SD	t-test	p-value
Before studying	30	30	13.10	43.67	2.89		
After studying	30	30	23.07	76.90	2.16	20.91**	.00

**: $p < .01$

It was found that students have an average developmental score of 58.40, which is considered a significant increase. Out of the students, 21 individuals, or 70%, have shown high levels of academic development, while 9 students, or 30%, have demonstrated moderate academic development (Table 5).

Table 5: The number and percentage of students with developmental scores after receiving problem-based learning

Criteria for relational development scores	Developmental level	Student (person)	Percentage
51-75	Advanced development	21	70
26-50	Moderate-level development	9	30

Out of a total of 30 students who underwent problem-based learning, 14 students achieved a good academic performance level, representing 46.68% (Table 6). Six students were at a very good level, accounting for 20%, while nine students were rated below good, 30%. After the test, the researcher asked students to complete a satisfaction survey on problem-based learning. The results showed that students were satisfied at a good level, $\bar{x} = 4.32$, with the average score for each aspect shown in Table 7.

Table 6: The number and percentage of students at each academic performance level

Level of academic performance	Number of students (people)	Percentage
Excellent	1	3.33
Very good	6	20.00
Good	14	46.68
Fairly good	4	13.33
Satisfactory	4	13.33
Adequate	1	3.33
Meets minimum criteria	-	-
Low	-	-
Total	30	100

Table 7: Average values table, SD, and the satisfaction level of students in problem-based learning for each item

Assessment categories	Assessment results		Level of satisfaction
	$\bar{x}$	SD	
Instructor's role	4.24	0.57	High
Student's role	4.39	0.70	High
Learning management	4.28	0.51	High
Measurement and evaluation	4.29	0.62	High
Benefits achieved	4.40	0.53	High
Total	4.32	0.58	High

The learning method is fun and not boring, according to the learners. Students can develop, learn, and discover new learning resources. Students are free to express their opinions, and views are exchanged among students. It also promotes giving students an opportunity to speak more, and getting more confident in questioning their doubts, further enabling them to be kindled. Providing an experience outside of the classroom as learning. On the contrary, there have been students who don't agree with PBL, and feel that PBL should always be kept as a secondary activity after the instructor has delivered the entire course material. Furthermore, others believe that PBL represents a heavy burden and responsibility on them, which if implemented in all courses can lead to student fatigue. Moreover, while examining performance at the level of education, other teachers have argued that PBL exploits those who persist in the use of full-time lecturing.

5. Discussion

The synthetic results of PBL in the Investigation and Inquiry Course are in line with research by Wei and Ye (2019). Although PBL is student-centered, instructors should take a facilitator role who provides a guideline based on students' reflections. Management of PBL in the Investigation and Inquiry Course can be divided into five steps, in compliance with research by Nathanson (1989). Theory of General Problem Solution has been applied, and PBL management is consequently divided into five steps: 1) identification of problems and targets, 2) authentication of facts, 3) identification and assessment of legal problems, 4) recommendations and decisions, and 5) planning and operation. Similarities are found in Steps 1-3 while differences are in Steps 4-5. According to additional comments from scholars, PBL is appropriate for certain courses only. This finding is in line with the results of research by Kurtz et al., (1990) who determined each legal problem has a different nature. Therefore, solutions to different problems need different approaches, depending on the learning objectives of each course. Moreover, learning outlines can be adjusted accordingly, based on the learning objective of each course. Results also show most law programs in Thailand focus on lectures, which is in line with research by Mahmood et al. (2023), who concluded that structure is a major problem for applying PBL in law course management. The structure here is likely to refer to the structure of the law curriculum.

When the problem-based teaching method was adapted for use with the sample group, it was discovered that this approach led to significant development in learners. This was evident not only in terms of academic achievement but also in skills related to collaboration with others and in cultivating a positive attitude toward learning the law. These findings are consistent with the research by Oliveira et al. (2022), who found that PBL is a flexible teaching method that boosts the efficiency and effectiveness of learner comprehension. Furthermore, it promotes skill development in understanding the law and relevant professional capacities. PBL enhances the learning environment and refines the dynamics between students and teachers, offering an avenue for learners to voice their opinions and suggestions freely.

However, from certain perspectives, resistance has been observed by both students and faculty members. They perceive this type of learning approach as something that should only serve as an additional activity, separate from regular teaching. This is consistent with the research by Wijnen et al. (2017), which suggests that this type of learning approach is not sufficient to properly prepare students for a future legal profession. Moreover, PBL is seen as placing an excessive burden on the students and is perceived as exploitative to other professors in the faculty who rely on full-time lecture-based teaching. This aligns with the study by Ssemugenyi (2023), which sees this teaching method as a strategy employed by instructors to evade their main responsibilities.

6. Conclusion

PBL is considered a novelty that requires both time and significant effort in planning to achieve an appropriate learning model. It is considered active learning that meets the criteria for educational quality assurance and stimulates learners to engage in self-directed learning, with the instructor serving only as a planner, monitor, and supervisor of the process. Furthermore, PBL also involves a diverse process of measurement and evaluation, which is completely different from traditional classroom management models. The results show that after implementing the Problem-Based Learning (PBL) model in the Investigation course, students' academic achievement and learning development noticeably improved. Initially, student satisfaction with the learning management model was evaluated across various aspects. Additionally, students viewed PBL not only as a new learning model but also as an innovative educational approach that, in their perception, could open new horizons for diverse learning experiences.

However, PBL may not be the best method for law faculties with many students, because it may encounter various problems and obstacles. Additionally, resistance may arise from instructors. Negative perspectives from students may arise, and it could also create difficulties and add burdens to the various involved personnel. Therefore, the researcher suggests that before implementing the PBL model in any course, an agreement should be made among the administrators, instructors, and relevant personnel, both in academic matters and classroom management. Additionally, experts should be involved in determining the appropriateness of the model. Most importantly, students themselves must play a role in defining the details of the content, as they are the ones who are directly impacted as the users of the approach.

Acknowledgment

This research project was financially supported by the Faculty of Law, Mahasarakham University, Thailand, and grant number 002/2565.

Compliance with ethical standards

Ethical considerations

This study followed the ethical standards of Mahasarakham University. All participants provided informed consent, and their confidentiality and anonymity were preserved throughout the research.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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