

Original Paper

PBL-Driven Teaching Reform of International Engineering Management: A Case Study of the Padma Bridge Highway Link EPC Project in Bangladesh

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Abstract

Chinese engineering enterprises have taken on an increasing number of overseas infrastructure projects as the Belt and Road Initiative has progressed, and the industry now looks for engineering management graduates who combine solid theoretical knowledge with practical skills such as contract interpretation, risk identification, cross-cultural performance, and dispute resolution. The traditional International Engineering Management course, built on lecture-based instruction and simplified cases, falls short of real overseas performance scenarios. PBL (problem-based learning) uses genuine engineering conflicts as learning vehicles and relies on group collaboration to complete material review, contract analysis, solution development, and report writing, effectively bridging classroom theory and overseas engineering practice. Before the course began, this study distributed a questionnaire to enrolled students and collected 85 valid responses. Combining the authors' own teaching experience, it selected the Padma Bridge Highway Link EPC Project in Bangladesh as a research case and, based on the FIDIC 2017 Silver Book Conditions of Contract, designed six engineering dispute topics for PBL teaching practice. The paper describes the whole teaching process, reports the reform effects, and offers suggestions for the problems identified, which may be useful for international engineering course construction in Chinese universities.

Keywords

International engineering management, PBL teaching, FIDIC 2017 Silver Book, EPC turnkey contracting, The Belt and Road Initiative

1. Introduction

1.1 Research Background

Over the past decade or so of Belt and Road cooperation, Chinese enterprises have greatly expanded their overseas infrastructure contracting, covering numerous countries in Asia, Africa, and Europe, and the EPC turnkey model has become the dominant form of international project delivery. Because the legal systems of the host countries vary, multiple risks—exchange rate fluctuations, local labor regulations, extreme climatic disasters, changes in employer instructions, and cross-cultural communication conflicts—are intertwined, and engineering managers therefore need strong abilities in contract interpretation, risk anticipation, and dispute handling.

For undergraduate engineering management majors, the International Engineering Management course deals with the international engineering contract system, risk management methods, cross-cultural management, and variation and claim handling. In classroom practice, some classes still spend most of the time explaining FIDIC provisions and theoretical knowledge, and the cases used are mostly idealized simplifications without the messy conflicts of real project performance. Students remain largely passive receivers of knowledge and seldom analyze complex performance conflicts from the general contractor's perspective. When they meet real overseas engineering scenarios, students often misjudge who bears the risk, apply contract clauses in the wrong way, or cannot build a complete chain of claim logic.

Unlike the traditional lecture-driven classroom, PBL starts from real and complex engineering problems. Students work in groups to consult contract documents, collect project background information, identify the risk boundaries of each party, and produce solutions, which puts students in the center of the learning process and turns theoretical knowledge into practical ability. Bringing the real overseas benchmark projects of the Belt and Road Initiative into PBL teaching design can raise the effectiveness of the course and align it better with the industry's actual talent needs.

1.2 Domestic and International Research Status

PBL first appeared in medical education and was later brought into the engineering field. In medical education, PBL takes clinical cases as the starting point and is generally acknowledged as an effective model of medical teaching. In the field of international engineering management, PBL is used to let students enter complex real engineering problems, and the related research is still being deepened, with the application of this model to specific courses and the exploration of real cases remaining relatively scarce. In the practice of this course, the teaching model is carried out around the FIDIC contract, centering on real project cases, with risk allocation, claim procedures, and dispute resolution as an important part of scenario-based training.

Domestic scholars have also studied the reform of the International Engineering Management course, mostly from the perspectives of FIDIC contract teaching, bilingual teaching, and project management teaching system construction. However, the reports on the whole-process teaching practice that

combines real overseas EPC project cases with the PBL model are still rare, and there is a lack of teaching cases and teaching feedback from the real performance experience of Chinese-funded enterprises. On the basis of the existing research, this paper carries out teaching practice around the real disputes of the Padma Bridge Highway Link EPC Project, in order to strengthen contract practice training for students.

Given the above, decomposing a real overseas EPC project into multi-dimensional performance problems, building a classroom-ready PBL case library, and forming an operable teaching implementation process are of clear practical research value.

1.3 Research Content and Significance

The work of this paper is organized around four tasks. It first sorts out the overall research status of the PBL teaching model in the field of international engineering management, then introduces the basic situation of the Padma project and its typical performance risks, then explains in detail the PBL teaching design and implementation process of the course, and finally reviews the teaching effects, identifies the remaining shortcomings, and puts forward corresponding improvement paths.

Theoretically, the paper adds to the PBL teaching case resources of the course, refines the ideas of case-based teaching reform, and offers implementation plans that similar courses can refer to.

Practically, training students with the complex scenarios of a real project helps them read FIDIC clauses, build international engineering risk awareness, and sharpen their abilities in contract interpretation, variation and claim handling, and cross-cultural performance, so that the graduates cultivated are better aligned with the needs of overseas engineering positions.

1.4 Questionnaire Survey and Analysis of the Current Teaching Situation

To learn about the actual learning conditions and needs of the students taking the course, and to keep the reform from being driven only by experience, the authors surveyed the enrolled students before the course started. The questionnaire covered students' basic information, previous course foundation, course selection motivation, career aspirations, attitude toward the PBL teaching model, acceptance of bilingual teaching, teaching method preferences, and ability training needs, and 85 valid questionnaires were collected. The survey results confirmed on the one hand that the traditional classroom needs to be reformed, and on the other hand gave direct evidence of the students' learning situation for the subsequent teaching design.

On their prior preparation, 51.76% of the respondents had never taken any project management course, and only 23.53% had completed Engineering Project Management. When it comes to the PBL teaching method, 63.53% knew nothing about it, and only 1.18% had actually participated in similar learning. As for English proficiency, 76.47% had not yet passed CET-4. Taken together, students selecting this course generally lack prerequisite knowledge, know little about PBL, and have a weak English foundation, so the reform should first of all lower the entry threshold.

When choosing international engineering positions, students valued “high salary and rapid wealth accumulation” (84.71%) and “broadening international horizons and experience” (75.29%) most, showing a preference for realistic returns and little understanding of the real work content and ability requirements of overseas positions. The top three abilities that students hope the course will strengthen are critical thinking and complex problem-solving ability (71.76%), cross-cultural communication and teamwork ability (61.18%), and international engineering contract (FIDIC) application ability (55.29%). On teaching methods, the options chosen by more students are online sharing and comments from industry experts (61.18%), online self-study plus classroom discussion (60%), and real case analysis and practical exercises (55.29%). Traditional theoretical teaching still won 49.41% support, which suggests that students do not reject necessary theoretical instruction but expect the classroom to link with real engineering scenarios.

2. Theoretical Overview of the PBL Teaching Model

2.1 The Connotation of the PBL Teaching Model

PBL, the problem-based learning model, departs from the traditional logic of teaching theory first and then doing exercises. Its core feature is to start from ill-structured problems that are complex and come from real engineering. Students learn in groups. In order to solve real engineering conflicts, they actively collect materials, study contract texts, and carry out group discussions, finally forming solutions. Teachers mainly play the roles of guidance and comments and generally do not directly give standard answers in class. Most disputes arising in the international engineering performance process are ill-structured problems without a unique optimal solution, which matches the characteristics of PBL teaching very well.

PBL teaching essentially involves the following core elements: engineering problems originating from reality, group collaborative inquiry, students’ autonomous learning, teachers’ guidance and comments, output presentation, and after-class review and reflection.

2.2 Suitability of Applying PBL to the International Engineering Management Course

At the level of course attributes, the match is clear. International engineering management is an interdisciplinary subject involving engineering law, engineering economics, project management, cross-cultural management, and other fields. Students can hardly understand risk boundaries from textbook explanations alone, whereas PBL teaching based on real cases supports the integrated use of multiple knowledge points.

The model also fits the talent demands of the industry. Various unexpected situations often occur during the execution of overseas EPC turnkey projects, and positions require practitioners to independently consult contracts, identify risks, and formulate disposal plans. What PBL trains is exactly these core competencies.

Third, PBL makes up for what traditional teaching inherently lacks. Traditional teaching cases are often over-idealized, while real projects generally have practical difficulties such as insufficient evidence, game-playing among multiple parties, differing understanding of contract clauses, and commercial trade-offs. PBL teaching trains students to look at engineering problems dialectically and keeps them from the one-sided cognition that no single formula can settle every claim problem.

2.3 Risk Allocation Characteristics of the FIDIC 2017 Silver Book EPC Model

For turnkey general contracting projects, the FIDIC 2017 EPC Silver Book is a common choice, and the risk allocation under it is tilted toward the general contractor. The contractor bears most of the commercial risks in the design, procurement, and construction stages, but this does not mean that all risks are unconditionally transferred to the contractor. Exceptional adverse climatic conditions, force majeure, variation instructions issued by the employer, and changes in law still divide the responsibilities of each party in accordance with the contract provisions. From the authors' classroom teaching experience, many students easily form a cognitive misunderstanding and simply think that under the EPC model all risks are borne by the contractor. This is also one of the knowledge points that the PBL teaching design of this course aims to correct.

3. Overview of the Teaching Case: The Padma Bridge Highway Link EPC Project in Bangladesh

3.1 Basic Overview of the Project

In Bangladesh, the Padma Bridge Highway Link EPC Project counts as a key transportation scheme and stands as a supporting project of China-Bangladesh cooperation under the Belt and Road Initiative. The project is located on the alluvial plain of the Padma River, with a total main line length of 55 km. The project content includes subgrade earthwork, bridge and culvert works, pavement works, traffic safety facilities, and related ancillary works. This project adopts the EPC turnkey general contracting model, and the contract applies the FIDIC 2017 Silver Book. The project signed the contract in June 2018, started in March 2019, with a planned construction period of 36 months, originally scheduled for completion in March 2022. Affected by multiple performance risks, the project was actually opened to traffic in December 2022, with a 9-month delay. The initial contract amount was about US\$4.16 billion, while the final settlement investment reached about US\$4.67 billion, a notable increase in the total project investment.

Bangladesh's Ministry of Road Transport and Bridges acts as the employer, while a consortium led by European and American consulting agencies provides supervision. A Chinese enterprise acts as the EPC general contractor, handling project design, cross-border material procurement, and on-site construction delivery, and many local Bangladeshi subcontractors and labor teams were also brought in. The funding comes from Bangladesh's own fiscal resources and China-Bangladesh bilateral loans.

The Padma River separates the east and west of Bangladesh, and the ferry crossings used in the past were inefficient. Multilateral development institutions once withdrew from the project due to related

questions. Bangladesh then raised funds on its own to push forward the Padma main bridge and the link works, opening up a transportation channel for the southwest of the country.

3.2 Six Typical Engineering Dispute Events during Project Performance

During construction, the project met with multiple high-frequency risks typical of overseas EPC projects. This paper extracts six groups of PBL inquiry topics from them, and each topic corresponds to the core teaching knowledge points of the course, with all of them based on publicly available project performance materials.

3.2.1 Topic 1: Time and Cost Claim Dispute Caused by Flood Disaster in an Extremely Long Rainy Season

In the 2020 and 2021 flood seasons, local rainfall was far above the historical average of the same period. The subgrade on the construction site was soaked by floodwater, construction access roads were damaged, and subgrade and culvert works were suspended many times, with cumulative effective suspension time exceeding 90 days. The employer and the supervisor regarded the rainy season as a routine climate that occurs every year in Bangladesh, refused to approve the extension of the time for completion, and did not recognize the related cost compensation. The general contractor submitted multiple claim documents in accordance with the contract, but only part of the time extension applications were approved, and most of the costs arising from idle labor and equipment were not compensated. The knowledge points involved include exceptional adverse climatic conditions, force majeure, EPC project claim procedures, and the boundary between time and cost claims.

3.2.2 Topic 2: Variation Price Dispute Caused by the Employer's Verbal Instructions

In the middle and later stages of construction, responding to local livelihood demands, the employer issued variations many times through verbal or informal documents, such as local adjustment of road alignment, addition of convenience crossings, and widening of non-motorized lanes. The actual on-site execution was to carry out the construction first and complete the variation procedures afterwards. After the contractor completed the incremental work, some of the variations did not form formal written instructions, and the employer did not confirm the incremental price for these parts, bringing evidence difficulties to the settlement work. The knowledge points covered here are the right of variation under the EPC model, the validity of verbal instructions, the contract handling of variations without written instructions, and the rules of variation valuation.

3.2.3 Topic 3: Congestion of Cross-border Material Clearance and Supply Chain Interruption Risk

The main steel and large pavement equipment were exported from China. The customs inspection procedures at Chittagong Port are complex. On top of that, the COVID-19 pandemic caused port congestion and rising international shipping prices, and landslides on inland roads during the rainy season further hindered material transfer. As a result, equipment and materials stayed at the port for a long time, the delivery cycle was extended, and the site had to suspend work waiting for materials. In order to catch up with the construction schedule, the contractor could only purchase some substitute

materials locally at high prices, pushing up the project's material costs. The knowledge points involved are the allocation of procurement and logistics risks under the EPC model, the risk boundary between the employer and the contractor, and the preparation of supply chain risk plans.

3.2.4 Topic 4: Exchange Loss Risk under the Dual-currency Settlement Model

The contract settles payments in two currencies, US dollars plus Bangladeshi taka. Large equipment and main materials are settled in US dollars, while local labor and small materials are settled in taka. During the project implementation period, the taka continued to depreciate, and the particular conditions of the contract did not set up clauses related to exchange rate adjustment. The exchange losses caused by the exchange rate decline were mainly borne by the contractor, directly compressing the project's profit margin. The topic covers the international engineering price adjustment mechanism, exchange rate risk allocation, and the means of exchange rate risk control in the bidding and performance stages.

3.2.5 Topic 5: Conflict of Chinese and Foreign Supervision Standards and Cross-cultural Acceptance Disputes

European and American consulting enterprises make up the bulk of the supervision consortium, and the project acceptance follows BS and ASTM standards, which clash with domestic construction processes and on-site management habits. After some processes were completed with mature domestic techniques, the supervisor refused acceptance on the grounds that they did not meet the European and American test standards, causing multiple rework and repeated inspection applications. The work habits of the Chinese and foreign parties differ significantly: the foreign party attaches great importance to written documents, while the on-site Chinese personnel are accustomed to verbal communication and coordination, resulting in low overall communication efficiency. The topic involves the validity of contractually agreed standards, the boundary of supervision responsibilities, engineering inspection and testing, and the paths for handling international engineering disputes.

3.2.6 Topic 6: Difficulties in Local Labor Management

Over 90% of the front-line labor was recruited locally in Bangladesh, with uneven skill levels. Bangladesh's labor laws have strict mandatory provisions on rest days, overtime approval, and wage protection. In the early stage of the project, the domestic labor management model was copied, resulting in labor turnover, low work efficiency, and hidden dangers of labor-management conflicts. In the later stage, a localized labor management system had to be built, bringing additional management costs. The topic corresponds to the contractor's labor obligations, the contractual responsibility of complying with host country laws, and the risk control of local human resources.

4. PBL Teaching Design and Implementation Based on the Padma Project

4.1 Design of Teaching Objectives

Following the course syllabus, the teaching objectives are set at three levels: knowledge, ability, and quality.

- 1) Knowledge objective: after completing the course, students are expected to grasp the key provisions of the FIDIC 2017 Silver Book and distinguish how risks are shared between the employer and the contractor under the EPC model; master the basic rules of international engineering variation, claim, and dispute resolution; and understand common international engineering risks, including exchange rates, supply chain, local labor, and cross-cultural management.
- 2) Ability objective: students should be able to locate key clauses in contract texts, identify risk points from engineering events, formulate disposal plans from the perspective of the EPC contractor, and show basic abilities in group collaboration and engineering report writing.
- 3) Quality objective: students are expected to develop risk awareness for overseas engineering, understand the real difficulties of Chinese-funded enterprises going abroad, uphold a spirit of contract, foster engineering ethics and patriotic feelings, and carry out the requirements of ideological and political education in the course.

4.2 Pre-class Preparation

For the teacher, the preparation work includes organizing the public background materials of the project, preparing the case task book (which gives only the descriptions of the engineering events, without contract analysis or reference answers), preparing the electronic version of the FIDIC Silver Book, dividing the six inquiry topics among the learning groups, and preparing the group evaluation form and the scoring standards for the output. Since 63.53% of the surveyed students knew nothing about PBL before, the task book also includes a one-page introduction to the PBL learning method, explaining the basic process of “problem—group—discussion—report,” so that the new classroom model will not leave students at a loss.

For the students, the preparation includes self-studying the basic content of the FIDIC Silver Book before class to understand the basic risk framework of EPC general contracting, forming learning groups of 5-6 members, and completing the internal role division, with positions such as contract study, material collection, report writing, and classroom presentation. Given that 51.76% of the students lack prerequisite project management courses and 76.47% have not passed CET-4, the pre-class materials add a quick overview of core project management concepts and a Chinese-English comparison table of high-frequency FIDIC professional vocabulary, which brings the self-study threshold down to a level the students can manage.

4.3 Teaching Implementation Process

The PBL teaching as a whole runs for 4 class hours in the classroom plus extracurricular group discussion. It is divided into five stages: problem release, extracurricular inquiry, classroom output report, teacher benchmark comments, and review and summary.

4.3.1 Stage One: Problem Release (1 class hour in class)

In this stage, the teacher introduces the overall background of the Padma Bridge Highway Link project, issues the case task book, and assigns the six groups of performance disputes to the six learning groups. The group tasks are clarified: sort out the cause and development process of the event; find the corresponding contract clauses of the FIDIC Silver Book; identify the risk responsibilities of each party; give disposal plans from the perspective of the EPC contractor; and output the group research report and prepare the classroom presentation PPT. It is also made clear that copying ready-made answers from the Internet is forbidden, and every judgment must be supported by contract provisions.

4.3.2 Stage Two: Extracurricular Group Inquiry (completed independently outside class)

Offline, each group studies the FIDIC contract, sorts out the event evidence, analyzes the risk allocation, and works out solutions through discussion. Teachers conduct online Q&A, giving only direction-level guidance without providing standard answers. Combined with the authors' actual teaching, students are prone to several typical errors: taking it for granted that the contractor bears all risks under the EPC model; claiming against the employer directly whenever losses occur; confusing exceptional adverse climatic conditions with force majeure; and ignoring procedural contractual constraints such as claim notices and written variation instructions.

4.3.3 Stage Three: Classroom Output Report (2 class hours in class)

The groups report one by one, each within 8-10 minutes. The reporting content includes event sorting, contract clause citation, risk identification, and contractor disposal plans. After the report, a classroom mutual-questioning session is set up, in which other groups can raise questions and carry out classroom critical thinking. Taking the flood claim topic as an example, other groups may ask: since Bangladesh enters the rainy season every year, shouldn't the contractor bear all the suspension losses? Such questions push the whole class to think deeply.

4.3.4 Stage Four: Teacher Benchmark Comments (1 class hour in class)

The teacher then gives benchmark comments, combining the contract basis prepared during lesson preparation with the actual handling of the project. The cognitive misunderstandings that commonly appear among students are corrected, the applicable boundary of FIDIC clauses is clarified, the plans given by the students are compared with the actual practices on the project site, and the advantages and disadvantages of different plans are analyzed. In this stage, the teacher also explains that international engineering is not only a game of contract provisions but also has to take commercial reality into account, and that many real problems simply have no perfect solution and have to be weighed among multiple parties.

4.3.5 Stage Five: Review and After-class Assignment

The fifth stage assigns review work after class. Each group revises and improves the group report in combination with the classroom questions and the teacher's comments. All students also submit a short personal learning reflection summarizing what the risk control of EPC projects has taught them.

4.4 Assessment and Evaluation Methods

The course no longer relies on the final exam paper alone, and the PBL teaching outputs are now included in the process-based grade. The evaluation includes three parts: the quality of the group report and PPT output, the classroom presentation and Q&A performance, and the personal learning reflections. The evaluation focus does not require the students' plans to be completely consistent with the actual practices of the project site, but values more whether the citation of contract clauses is accurate, whether the risk identification is complete, and whether the logic of the plans is rigorous. In line with the course syllabus, the total grade is composed of the group case presentation (20%), class participation (10%), two online tests (20%), and the final examination (50%), and the PBL outputs mainly fall into the first two parts. All the task requirements and scoring rules are announced to the students in the first week of the course.

5. Teaching Practice Effects and Existing Problems

5.1 Achievements of the Teaching Reform

Judging from the feedback in the classroom, the reform has brought visible effects in several aspects. First, students no longer mechanically memorize FIDIC provisions and can understand the meaning of clauses in combination with specific engineering scenarios, correcting typical misconceptions such as "under the EPC model the contractor bears all risks," and their contract practice ability has improved. Second, through training in the complex scenarios of real overseas projects, students have established international engineering risk thinking, recognized the important position of evidence retention and procedural compliance in overseas projects, and understood that international engineering management is a comprehensive game of contracts, commerce, and cross-cultural communication. Third, group collaboration exercises students' comprehensive abilities of division of labor and cooperation, report writing, and public presentation; by relying on the real cases of Chinese-funded enterprises under the Belt and Road Initiative, the ideological and political education of the course is integrated, which gives the students a deeper understanding of what China's overseas engineering contracting industry actually does.

A comparison between the pre-class questionnaire and the classroom feedback shows that the reform direction basically matches the students' demands. Before class, 71.76% of the students had expectations for practical teaching. After a complete round of training, students who had known nothing about PBL could independently explain the risk allocation points involved in each topic, and the three abilities most demanded in the questionnaire—critical thinking, cross-cultural collaboration,

and FIDIC contract application—are exactly what the reporting and mutual-questioning sessions of each group trained the most.

Specific episodes in the classroom illustrate this point better. During the report on the flood claim topic, a group directly characterized the suspension caused by the Bangladeshi rainy season as “force majeure,” on the grounds that “with more than ninety days of continuous rain, no one can withstand it.” In the comment session, the author asked: the employer and the supervisor regard the rainy season as a normal climate that occurs every year locally, so on what basis should it be treated as force majeure? The group members could not answer on the spot. After class, they studied the FIDIC clauses all night, and in the second report they themselves explained clearly the applicable conditions of exceptional adverse climatic conditions and force majeure. Similar situations of “being questioned and then making up the lesson” occurred many times, which shows that real-case classroom questioning helps students remember knowledge points better than plain clause explanation.

5.2 Existing Problems in the Teaching Implementation Process

First, the most prominent problem is the tight class hours. Fully implementing the whole set of PBL teaching requires occupying more in-class hours. Under the premise of limited total course hours, the time allocation between theoretical teaching and PBL practical teaching needs to be balanced. This contradiction had already shown signs in the pre-class questionnaire, where 37.65% of the students listed “limited class hours and heavy task pressure” as their main concern about practical teaching.

Second, the students show a wide gap in contract reading ability. Some students have difficulty reading the original foreign-language FIDIC texts, and the depth of clause understanding varies among different groups. The questionnaire data and the classroom observation confirm each other: 76.47% of the students have not passed CET-4, and 65.88% of the students admitted having difficulty reading English cases and contract clauses. It is unrealistic to expect students to work through the original English FIDIC within the class hours available.

Third, the case materials are limited in an objective sense. Although the case comes from a real project, the internal commercial negotiation details and the complete claim reports of the project are non-public materials, and students can only rely on public information to complete the deduction. In the pre-class questionnaire, 57.65% of the students said they were unfamiliar with international engineering cases. Public materials can support the basic deduction, but the complete internal commercial logic of the project is still out of reach for the students.

6. Optimization Countermeasures for Course Teaching

The first measure is to strengthen pre-class preview and shorten the in-class time for explaining basic concepts. Push the Chinese translation of the FIDIC Silver Book and the project background materials before class, require students to complete the preview before class, and leave the classroom time for group reports and classroom critical thinking. It is also possible to select 2-3 key topics from the six topics for complete PBL teaching and assign the remaining topics as after-class extension assignments, so as to relieve the pressure of class hours. This arrangement also responds to the preference of 60% of the students in the questionnaire for “online self-study plus classroom discussion,” moving the learning of basic concepts forward so that the classroom time is used for discussion and reporting.

As a second measure, a proper learning scaffold should be built for the students. Provide students with the Chinese translation of FIDIC and give clause retrieval guidance to lower the threshold of contract study; adopt the principle of matching strong and weak students when grouping, so as to drive the students with weak foundations to participate in group inquiry. The questionnaire shows that 65.88% of the students have difficulty reading English contracts and 85.88% worry about insufficient professional vocabulary. The Chinese translation and the clause retrieval guidance target these weak points directly. Teaching resources also need to be enriched, which is the third measure, so that virtual and real cases complement each other. In addition to the Padma project, introduce simplified cases of Belt and Road projects such as the Jakarta-Bandung High-Speed Railway and the China-Laos Railway to build the course case library; push the literature on Chinese-funded enterprises’ overseas EPC performance after class as extended reading materials. In the questionnaire, 61.18% of the students hoped to hear online sharing from industry experts, and 57.65% of the students felt unfamiliar with international engineering cases. A case library combining virtual and real cases, together with experts entering the classroom, can answer both demands.

The ideological and political education of the course should continue as well. In the case discussion, students are guided to think about the opportunities and challenges faced by Chinese-funded enterprises going abroad, with the aim of strengthening their contract awareness, risk awareness, and patriotic feelings.

Bilingual teaching should also advance step by step instead of blindly raising the proportion of English. The questionnaire shows that 85.88% of the students worry about insufficient professional vocabulary, and nearly 70% of the students report difficulty in reading and writing English contracts. Bilingual teaching must start from the students’ actual level. The specific practice is: maintain an English proportion of about 20% in the initial stage, gradually increase it to 50% in the middle stage, and then transition to 80% in the later stage; provide supporting materials such as the high-frequency FIDIC professional vocabulary list, the Chinese-English comparison version of English cases, and the claim report writing template; allow the students with weak foundations to first use Chinese with a short English summary attached in classroom reports, while encouraging the students with better English to

present fully in English, so that language does not become a barrier to taking part in the practical tasks. Finally, the assessment, evaluation, and certification guidance should be optimized to ease the students' end-of-term anxiety. In the open-ended questionnaire, "final exam" and "not failing the course" are high-frequency words repeatedly mentioned by students, indicating that end-of-term pressure is an important factor affecting the learning experience. After the reform, the process-based assessment should be further implemented: include the completion of group tasks, individual contributions, and classroom discussion performance in the total evaluation, and reduce the weight of the one-time final assessment; publish all the task lists and scoring rules in the first week of the course to reduce the anxiety caused by information gaps. Regarding international certifications such as PMI and IPMA, the questionnaire shows that 91.76% of the students have no intention to apply. In teaching, the school-level micro-certification is positioned as an in-school ability certificate, and the time and economic costs of social certification are explained objectively, so that the pressure of certification is not shifted to the course.

7. Conclusion

Training professional talents for the foreign engineering field is the task of the International Engineering Management course, and the traditional theoretical teaching model alone cannot fully exercise the students' engineering practical ability. The PBL problem-oriented teaching model uses the performance conflicts of real overseas EPC projects as the driver, guides students to study FIDIC contracts independently, identify risks, and deduce disposal plans, and turns theoretical knowledge into practical ability.

With the Padma Bridge Highway Link EPC Project in Bangladesh as the case, this study identifies six types of real engineering problems—claim disputes, variation price disputes, supply chain risks, exchange losses, cross-cultural acceptance conflicts, and local labor management—and completes the whole set of PBL teaching design. Classroom practice shows that this teaching model can deepen students' understanding of the risk allocation rules of the EPC model under the FIDIC Silver Book, break the idealized cognition of textbooks, and improve the comprehensive professional ability of students. This teaching model also faces practical problems such as tight class hours and uneven contract reading ability among students, which can be continuously optimized through pre-class preview, selection of teaching topics, and building learning scaffolds. The pre-course questionnaire provided a clear learning-situation coordinate for this round of reform. The students' expectations and concerns about practical teaching were finally turned into specific arrangements in the teaching design, which also makes the reform measures clearly targeted.

In the coming teaching rounds, the authors will continue to explore real engineering projects under the Belt and Road Initiative, keep enriching the PBL teaching case resources, and advance the teaching reform of the International Engineering Management course, with the aim of cultivating more

engineering management professionals who combine theoretical foundation with practical thinking for China's overseas engineering sector.

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