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Research on the Application of Case-Based Teaching in the Ideological and Political Education of IT Project Management Courses

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Abstract: Guided by the Outline for Building a Strong Education Nation (2024–2035), this study addresses the challenges in integrating Curriculum ideology and politics (CIP) into the IT Project Management and explores the innovative application and practical pathways of the case-based teaching method. The paper first examines the existing shortcomings in current teaching practices and establishes an integrated teaching reform framework encompassing "theory–practice–evaluation." At the theoretical level, it closely aligns with the ten knowledge areas of PMBOK and incorporates major national IT projects as teaching cases, achieving an integration of professional knowledge instruction and value-based guidance. At the practical level, experimental projects are designed to promote the application of theoretical knowledge and the internalization of values through hands-on tool practice and project simulation. The study also develops an assessment system centered on formative evaluation, incorporating multidimensional indicators, and innovatively introduces a "3-minute instant classroom feedback" mechanism, forming a closed loop of "teaching–feedback–improvement." Practice has shown that the case-based approach to CIP effectively enhances students' learning motivation, strengthens their professional sense of mission, and improves comprehensive competencies, offering a practical pathway for engineering programs to achieve the goal of fostering virtue through education.

Keywords: IT Project Management; Curriculum Ideology and Politics; Case-Based Teaching; Process Assessment; Classroom Teaching Feedback.

1. Introduction

Case-based Teaching originated from the pedagogical philosophy proposed around the 1870s by Christopher Columbus Langdell, former dean of Harvard Law School. Initially applied systematically in legal education, it gradually evolved into the dominant instructional model in law schools across common law jurisdictions such as the United States and Canada. Subsequently, this teaching approach was widely adopted across diverse academic fields including medicine, economics, management, and sociology. Its strong interactivity and practice-oriented nature have made it widely popular among students.[1]

The core of this method lies in the teacher's selection of representative cases and the creation of problem-based scenarios, guiding students to grasp relevant theories and develop problem-solving thinking through analysis and discussion. The teaching focus is on encouraging students to actively participate in case studies and propose concrete solutions, thereby deepening theoretical understanding and achieving the unity of knowledge and practice. In teaching practice, teachers can integrate course content by introducing typical cases related to major national projects. Through lectures, analysis, and classroom discussions, students can enhance their professional knowledge while subconsciously strengthening national confidence and a sense of identity. This approach facilitates the integration of moral education goals into specialized teaching, effectively implementing the fundamental educational mission of fostering virtue through education. In January 2025, the *Outline for Building a Strong Education Nation (2024–2035)* issued by the Central Committee of the Communist Party of China and the State Council emphasized shaping a new paradigm for fostering virtue through education and cultivating a new generation capable of shouldering the mission of national rejuvenation. It specifically highlighted the importance of integrating ideological and political education across all disciplinary systems, teaching systems, textbook systems, and management systems.[2]

As a core compulsory course in computer-related disciplines, IT Project Management demonstrates distinct interdisciplinary characteristics and a high degree of knowledge integration. This course systematically covers the ten knowledge areas and five process groups defined by the international Project Management Body of Knowledge (PMBOK®), offering a comprehensive introduction to relevant methodologies, tools, and techniques, thereby reflecting a close integration of theory and practice[3]. By incorporating advanced project management theories, the course aims to enhance the management effectiveness of software engineering projects, playing a key supporting role in cultivating high-level information technology talents with international perspectives and engineering literacy. Building upon this foundation, the organic integration of ideological and political education into the curriculum—through restructuring teaching philosophies, innovating instructional models, and carefully selecting case resources, along with systematic design and continuous reflection on the teaching process and educational outcomes—can create a synergistic educational environment. The resulting educational impact often exhibits greater comprehensiveness and permeability compared to traditional ideological and political courses.

2. Problems and Deficiencies Existing in Current Teaching Activities

Course resources remain underdeveloped. The alignment between the course objectives and national strategies as well as industry needs is insufficient, failing to

fully reflect the central role of this course within the software engineering curriculum. Students often view the course merely as a credit requirement, lacking intrinsic motivation for learning, which results in limited knowledge acquisition. Teaching materials such as textbooks, syllabi, lesson plans, and courseware have not systematically integrated CIP, thereby hindering the full realization of the educational function of the specialized course. The current assessment system relies predominantly on written examinations, with fixed weightings for regular performance (40%) and final exams (60%), making it difficult to comprehensively evaluate students' overall competencies and practical abilities. This structure is not conducive to teaching feedback and continuous improvement.

Teachers' instructional capabilities require enhancement. In current teaching practices, some teachers still exhibit shortcomings in the organic integration of ideological and political elements, failing to fully leverage course-specific characteristics to achieve value-based guidance. Furthermore, in terms of teaching methods, teacher remains largely teacher-centered, while the depth and systematic application of innovative approaches such as case-based teaching and project-driven learning still need strengthening. A student-centered competency cultivation system has yet to be fully established. The teaching faculty needs to improve synergistically in both curriculum-based ideological and political development and the innovation of teaching models.

The institutional mechanisms for CIP at the institutional level are not yet fully established. At the school level, there is a lack of theoretically grounded and practically validated top-level design. The development of supporting resource platforms lags behind, and there is a shortage of widely applicable exemplary cases or dedicated coordinating bodies to facilitate implementation. Although most institutions have generally responded to national policy requirements, challenges such as insufficient collaboration and weak implementation frameworks persist in practice. As a result, there remains a gap between the actual educational outcomes of curriculum-based ideological and political education and the intended objectives.

3. Design of Curriculum and Teaching Reform

This course leverages the disciplinary characteristics of IT Project Management to advance curriculum reform through theoretical and practical instruction. (1) In terms of theoretical instruction, it systematically teaches the knowledge system of IT project management, introduces national-level major project cases such as the Chinese Lunar Exploration Program and the Hong Kong-Zhuhai-Macao Bridge, and integrates value guidance into the teaching content to achieve the organic fusion of CIP and specialized teaching. Through innovations in diverse teaching methods, the effectiveness and engagement of theoretical teaching are further enhanced. (2) In practical teaching, the focus is placed on reinforcing the application and internalization of theoretical knowledge. Efforts are concentrated on designing experimental case studies, constructing a diversified assessment system, and refining course evaluation mechanisms, thereby establishing a progressive instructional path of "theoretical understanding—practical reinforcement—value internalization." This approach facilitates a synergistic elevation of knowledge transmission and value guidance, an organic integration of personal development and national needs, and a profound unity of professional skills and social responsibility.

3.1. Theoretical Teaching

This course adopts the ten knowledge areas and five process groups of PMBOK as its instructional framework. Due to the extensive and complex theoretical system, there is a need for systematic integration of existing teaching content, strengthening the logical connections between knowledge points, and constructing a case-based curriculum for CIP. This course adopts the ten knowledge areas and five process groups of PMBOK as its instructional framework. Due to the extensive and complex theoretical system, there is a need for systematic integration of existing teaching content, strengthening the logical connections between knowledge points, and constructing a case-based curriculum for ideological and political education. While maintaining the core structure of the course, adjustments will be made to the allocation of teaching hours: increasing emphasis on core theoretical knowledge to highlight key teaching points, while reducing time spent on non-essential content. The course is structured around the ten knowledge areas, covering the processes, inputs and outputs, as well as tools and techniques in each area. Special focus is placed on four core areas—scope, schedule, cost, and quality management—while streamlining repetitive content. In theoretical instruction, the course incorporates national-level cases such as the "14th Five-Year Plan" and major scientific and technological projects like the "BeiDou" and "Chang'e" initiatives. Through these concrete examples, knowledge is delivered in a contextualized manner, aiming to stimulate students' professional interest and scientific enthusiasm, enhance their national identity and cultural confidence, and deepen their understanding of theoretical concepts. Additionally, the course will closely follow industry trends by introducing emerging project management models and continuously updating the teaching content. Blended learning will be implemented via online platforms to diversify classroom formats and resources, creating a dynamic and efficient learning environment. Students will also be guided to conduct independent inquiry, reinforcing and extending what they have learned in class.

3.2. Practical Teaching

While the theoretical instruction of this course aims to help students build a systematic knowledge framework of IT project management, the cultivation of their practical problem-solving abilities remains insufficient. To address this, the course adopts a synchronized "theory–practice" teaching model, introducing practice-based sessions grounded in "case analysis" alongside theoretical instruction. The selected cases are primarily drawn from major national scientific and technological projects, which not only serve as vehicles for knowledge and technology but also embody scientific spirit and value-driven pursuits. Integrating such cases into teaching can deepen students' understanding of professional knowledge while subtly fostering their scientific literacy, national commitment, and innovative responsibility, thereby achieving the dual goals of value guidance and talent development.

Case-based teaching is student-centered, with teachers guiding group discussions around the cases. By immersing

themselves in contextualized scenarios, students identify problems, think critically, and propose solutions, thereby closely integrating project management theory with practical application. This approach enables students to engage with real-world project environments, analyze issues from a project manager's perspective, and explore solutions through the lens of the project management knowledge system. The experimental component of IT project management focuses on tool application and hands-on practice, guiding students to use professional software such as MS Project for project planning, WBS decomposition, and Gantt chart creation, while also utilizing Word/Excel for project charter and documentation preparation. The practical training component further guides students to comprehensively apply the learned knowledge system in simulated end-to-end software development and project management exercises, emphasizing the enhancement of their ability to solve real-world problems and laying a foundation for their future development as competent project managers.

4. Implementation of Teaching Reform

This course comprises a total of 48 class hours, with 4 hours per week, including 38 hours of theoretical instruction and 10 hours of experimental teaching. Students are organized into groups at the beginning of the course, with grouping to be completed before the second class session. Each group consists of 5 to 8 members and is required to assign roles such as project manager, product manager, system architect, front-end and back-end development engineers, testing engineer, and software quality assurance (SQA) specialist. All members of each group are seated together during class sessions. [4]

4.1. Implementation of Theoretical Teaching

Table 1. Summary of Teaching Design

Curriculum content	Case	The goals of CIP	Diversified teaching methods	Class hour
Integration Management	The 100-year journey of the Communist Party of China; South-to-North Water Diversion Project; West-to-East Gas Pipeline Project; The coordinated management of the three regions in the construction of the Hong Kong-Zhuhai-Macao Bridge;	Cultivate strategic thinking, Practice the systematic perspective of serving the country through science and technology	Lecture, case teaching, group tasks	6
Scope Management	"The 14th Five-Year Plan"; BeiDou Navigation Satellite System; Chang'e Program; Spring Festival travel Demand change control of the 12306 system;	Establish a spirit of contract, pay attention to commitment and execution, and have a holistic perspective	Lectures + examples, role-playing, and practical exercises	5
Schedule Management	The Tortoise and the Hare Revise the Rules; The 10-day construction progress control of Huoshenshan Hospital;	Form the habit of being punctual and efficient, and understand that time is productivity	Tool training, group discussion	6
Cost Management	The Ants Store Food in Summer for Winter; Cost-benefit Analysis of New Energy Subsidy Policies;	Strengthen the national sense of mission to optimize the allocation of scientific and technological resources	Teaching + calculation exercises, case analysis, and organizing debates	4
Quality Management	The Craftsman Polishes a Mirror for Ten Years; "Zero defect" management of Fuxing bullet trains;	Cultivate a spirit of craftsmanship that strives for excellence and pursue outstanding quality	Lectures + demonstrations, video learning	2
Resource Management	Liu Bei's three visits to Zhuge Liang; The collaborative model of a ten-thousand-person team in aerospace engineering	Emphasize teamwork and respect individual value	Scenario simulation, 360-degree feedback	4
Communications Management	Yanzi's Mission to Chu; Cross-cultural communication for the Belt and Road Initiative projects; Medical accident;	Cultivate the capacity for technological diplomacy in building a community with a shared future for mankind	Practical drills, document evaluations, and cross-group exchanges	2
Risk Management	The Squirrel Stores Nuts for Winter; Risk contingency Plan for the Chip Industry Supply Chain Cybersecurity protection for the financial system;	Enhance the sense of crisis and cultivate the ability to deal with problems calmly	Brainstorming and situational response	4
Procurement Management	The Fox Bargains Using the Tiger's Authority; Government procurement of domestic operating systems as substitutes;	Adhere to the bottom line of integrity and eliminate academic and commercial corruption	Contract analysis, simulated bidding, ethical discussion	4
Stakeholder Management	Hearing system; The construction of Xiongan New Area involves the coordination of interests among multiple parties	Cultivate a professional ethics that prioritizes users and serves the society	Character card games, video cases	1

IT Project Management represents the application of project management principles specifically to software development, with its core lying in systematic management practices. Theoretical instruction primarily focuses on the ten knowledge areas of PMBOK, including integration management, scope management, schedule management, cost management, quality management, resource management, communication management, risk management, procurement management, and stakeholder management. A key pedagogical challenge is how to flexibly apply the aforementioned theoretical knowledge to real-world project scenarios. Simultaneously, integrating CIP throughout IT project management serves as a primary principle of the course instruction. Without such guidance, the developed software products may lack the necessary value and depth. This course emphasizes the use of case-based teaching methods to organically incorporate ideological and political elements into knowledge delivery. By analyzing major national projects such as the "BeiDou Navigation Satellite System" and the "Hong Kong-Zhuhai-Macao Bridge," students' national pride and professional sense of mission are strengthened, their learning initiative and engagement are enhanced, and the issue of theory-practice disconnect often found in traditional teaching is effectively addressed. To

achieve deep integration of CIP with professional content, this course has systematically designed instructional strategies tailored to the characteristics of each chapter, with a summary of the specific approach outlined in Table 1.[5]

4.2. Implementation of Practical Teaching

The practical component of this course is centered around laboratory-based activities. Aligned with key theoretical concepts, the course includes six laboratory projects—comprising five design-oriented experiments and one application-oriented experiment. The design-oriented experiments aim to deepen students' understanding and application capabilities of IT project management theories, while the application-oriented experiment focuses on assessing their comprehensive practical skills in project management. A detailed design of the specific experimental teaching content is provided in Table 2. [6]

Table 2. Instructional Design for Practical Teaching Experiments

Serial number	Type	Chapter	Experimental content	Class hours
Experiment One	Design-oriented	Project scope management	Create a project WBS	2
Experiment Two		Project progress management	Draw the Gantt chart of the project	2
Experiment Three		Project Cost management	Budget	2
Experiment Four		Project Quality Management	Compile the quality plan	1
Experiment Five		Project Risk Management	Prepare the risk register	1
Experiment Six	Application-oriented	Smart medical service platform	Take the "Smart Medical Service Platform" as an example to conduct scope management, progress management, cost management, quality management, risk management, stakeholder management, etc. for the project	2

5. Classroom Teaching Feedback

To establish an effective teaching feedback and continuous improvement mechanism, it is recommended to introduce a three-minute immediate classroom feedback session at the end of each class. This session should regularly and frequently collect student opinions through structured questionnaires. The questionnaire should be hierarchically designed around teaching objectives, progressing from simple to complex and from specific to open-ended questions. For instance, it may include the following dimensions: (1) quantitative assessment (e.g., a 0–10 rating on the effectiveness of CIP); (2) positive feedback (e.g., listing two positive experiences during the class); and (3) constructive suggestions (e.g., proposing one specific area for improvement). Such a progressive question design helps systematically capture students' diverse perceptions of teaching content, methods, and outcomes. Upon receiving feedback, instructors should promptly analyze and respond in a manner consistent with students' communication styles, thereby fostering a positive interactive loop between teaching and learning. [5]

6. Course Assessment and Evaluation

The assessment system of this course is closely aligned with the teaching objectives, comprehensively covering three dimensions: mastery of professional knowledge, development of practical skills, and cultivation of ideological and political literacy. The assessment structure is divided into two main components: regular assessment and final assessment. Regular assessment includes attendance, assignments, class participation, post-class discussions, and periodic tests, while the final assessment primarily takes the form of a comprehensive major assignment to systematically evaluate students' overall learning outcomes. The course adopts a combination of formative and summative evaluation methods, emphasizing diversity and systematicity in assessment. Specific evaluation methods and their corresponding weightings are detailed in Table 3.[5]

Table 3. Course Assessment Methods and Grading Distribution

Assessment stage	Form	Proportion (%)	Assessment content and scoring criteria
Regular Term	Attendance	5	The assessment is based on the classroom sign-in records on the Learning Pass platform
	Homework	10	The assessment is based on the test scores of theoretical and practical questions in the Learning Pass platform
	Classroom performance	15	The teaching group will conduct a comprehensive evaluation through multiple dimensions, including case analysis, defense performance, innovation, document quality, mutual evaluation among groups, and classroom interaction
	After-class discussion	10	The assessment is based on the frequency of discussion participation recorded on the Learning Pass platform
	Interim test (mid-term)	20	It covers theoretical knowledge in integration management, scope management, schedule management and cost management, with a focus on examining theories and methods such as project network diagrams and earned value analysis
	Phase testing (later stage)	20	It covers the relevant theories and knowledge in quality management, resource management, communication management, risk management, procurement management and stakeholder management
End of term	Final exam	20	The assessment of the final major assignment grades based on the records of the Learning Pass platform

7. Summary

Teaching reform practice has demonstrated that the integration of CIP through case-based teaching has achieved phased results. By incorporating national key technological projects into the theoretical instruction of the PMBOK knowledge system and implementing tiered project training in practical sessions, an organic unity of professional knowledge transmission and value guidance has been realized. This reform not only stimulates students' learning initiative and professional identity but also deepens their understanding of national strategies while mastering core skills, thereby strengthening their sense of mission to serve society. However, the development of CIP till requires continuous deepening. Future key priorities include: first, constructing a categorized and dynamic repository of ideological and political case resources, developing teaching cases with contemporary relevance based on advancements in science and technology; second, strengthening the systematic cultivation of teachers' ideological and political teaching capabilities, and building professional teaching teams through diversified teaching and research activities; third, refining the course evaluation system by incorporating value cultivation into formative assessments, thereby establishing an educational evaluation mechanism that integrates knowledge, skills, and values. As teaching reforms continue to advance and optimize, the integration of CIP into specialized courses will play a more substantial role in cultivating engineering and technical talents for the new era, ultimately achieving high-quality synergistic development of moral education and professional education.

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