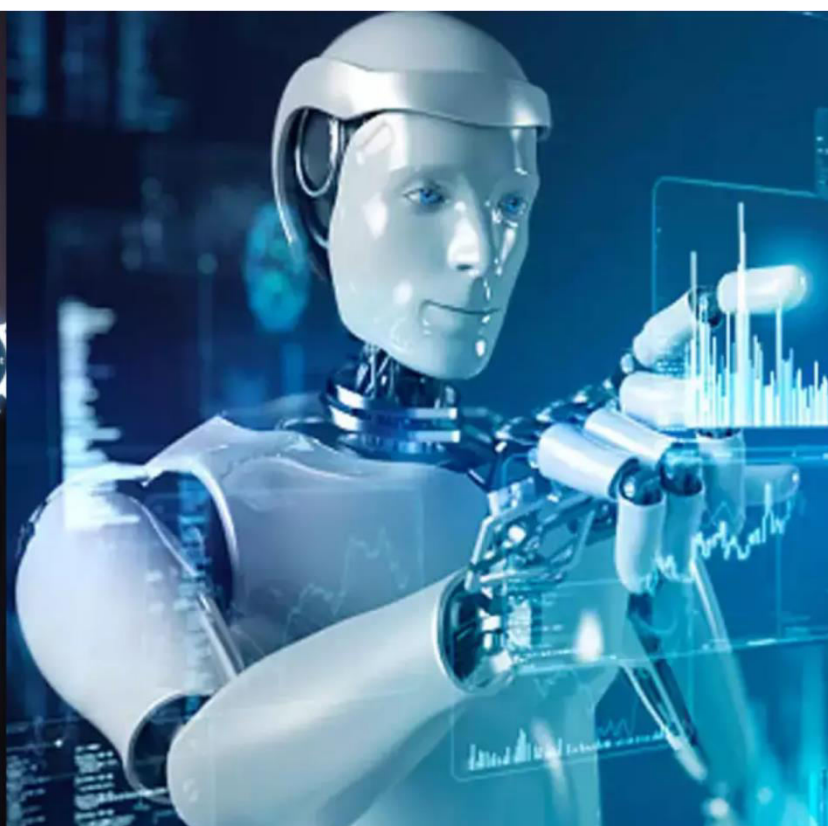




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Research on the Teaching Mode of Transport Economics Based on the ADDIE Model

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ABSTRACT: This paper systematically explores how the Transport Economics course can establish a blended teaching system based on the ADDIE instructional model to effectively integrate ideological and political education. By analysing the convergence points between the characteristics of the Transport Economics course and ideological and political elements, a blended teaching scheme centred on the ADDIE model was designed. This involved developing integrated "online + offline" teaching resources and activities, implementing a three-stage teaching process of "theoretical learning – case analysis – practical application", and constructing a multi-dimensional evaluation system. Practice demonstrates that this teaching model not only enhances students' mastery of professional knowledge but also effectively strengthens their patriotic sentiments, professional ethics, and sense of responsibility. It provides an effective pathway for cultivating well-rounded builders of a transport powerhouse.

KEYWORDS: Transport Economics, ADDIE Model, Blended Learning, Ideological and Political.

I. INTRODUCTION

In May 2020, the Ministry of Education issued the "Guiding Outline for Integrating Ideological and Political Education into Higher Education Courses," explicitly stating that "comprehensively advancing course-based ideological and political education is a strategic measure to fulfil the fundamental task of fostering virtue through education and a crucial undertaking to enhance the overall quality of talent cultivation." In 2022, the Ministry further emphasised the need to "promote high-quality development of ideological and political education within curricula, establishing a comprehensive framework for holistic education involving all members throughout the entire process." Against this backdrop, Transport Economics, as a core course in transport-related disciplines, urgently requires exploration of effective pathways for integrating ideological and political education.

The ADDIE instructional design model, as a systematic and scientific educational design framework, comprises five stages: Analysis, Design, Development, Implementation, and Evaluation. This model is guided by teaching objectives, centred on systems thinking, and prioritises cultivating student competencies, making it particularly suitable for the systematic design of ideological and political education within courses. Furthermore, the ADDIE model emphasises evaluation at each stage, facilitating continuous refinement of course content and teaching methodologies to achieve ongoing improvement.

Blended learning organically integrates online and offline teaching formats, characterised by resource support, task-driven approaches, competency orientation, data feedback, and evaluation safeguards. This pedagogical approach offers extensive scope for integrating ideological and political education into courses: online resources provide abundant ideological materials, offline activities deepen experiential learning, and data feedback enables precise evaluation of educational outcomes. Particularly for courses like Transport Economics, where theory and practice are closely intertwined, blended learning effectively achieves the organic unity of "knowledge transmission – value guidance – competency development".

II. PATH DESIGN INTEGRATED INTO ADDIE MODEL

2.1 Analysis Phase: Precisely Identifying Ideological and Political Elements and Teaching Requirements

During the analysis phase, the following key tasks are undertaken:

a) Student Profile Analysis

Utilise questionnaires and interviews to understand students' grasp of foundational transport economics knowledge, learning interests, and prevailing values, thereby establishing a basis for the precise integration of ideological and political elements.

b) Identification of Ideological and Political Elements

Systematically catalogue inherent ideological and political elements within the Transport Economics curriculum. Examples include: - Fostering national development pride and ethnic identity through China's high-speed rail achievements and the Transport Powerhouse strategy; - Instilling core socialist values through principles of integrity and social service within the transport industry; - Emphasising social responsibility and accountability by highlighting transport's role in safeguarding livelihoods and promoting balanced regional development.

c) Teaching Environment Analysis

Assess the institution's digital teaching infrastructure, faculty technological proficiency, and student digital literacy to ensure environmental readiness for blended learning implementation.

2.2 Design Phase: Establishing a Tripartite Teaching Objectives Framework

During the design phase, a tripartite teaching objective system integrating knowledge, capability, and values was established, tailored to the characteristics of the Transport Economics course. In terms of teaching strategy, a three-stage model of "online guidance – offline deep learning – practical research" is adopted. This seamlessly integrates ideological and political elements into professional knowledge instruction, avoiding forced integration and superficial separation.

Specifically, it includes the following three goals. The first is the knowledge objectives. Master foundational theories such as transport demand and supply, transport costs and pricing; comprehend the characteristics of transport economic issues and their connection to general economic theory. The second is the competency objectives. Develop the ability to analyse transport phenomena and interpret transport policies using transport economics thinking, enhancing practical skills to resolve real-world transport economic challenges. The last is the value objectives. Establish sound values, strengthen the "Four Confidences", cultivate patriotic sentiment and a sense of responsibility, and develop sound professional ethics.

2.3 Development Phase: Creating a "Five-in-One" Blended Learning Resource System

Based on the ADDIE model, the development phase constructs a "five-in-one" teaching resource system organically integrating "online, offline, theory, practice, and ideological and political education":

a) Online Resource Development

Production of micro-lecture videos covering core concepts in Transport Economics; creation of a case repository on China's high-speed rail development and the Transport Powerhouse initiative; establishment of a virtual simulation platform for Transport Economics experiments.

b) Offline Resource Development

Compile teaching cases integrating ideological and political elements; design thematic practical activities such as "Witnessing China's Railway Development, Forging Resolve for a Transport Powerhouse"; develop teaching guidelines for incorporating ideological and political education into the Transport Economics curriculum.

c) Blended Learning Activity Design

Pre-class: Students engage in self-directed learning of foundational theories via online platforms and undertake preliminary exposure to ideological and political elements. In-class: Instructors guide students in in-depth analysis of transport economics issues and facilitate substantive discussions on ideological and political elements. Post-class: Students participate in transport industry research and prepare ideological and political practice reports.

2.4 Implementation Phase: Innovation in Blended Teaching Methods and Approaches

During implementation, the following innovative teaching methods were prioritised: a) Case-Based Teaching Method: Selecting exemplary cases such as "Expanding Road Network Standards," "Cutting-Edge Technological Innovation," and "Interconnected Railway Networks," employing problem-based teaching to stimulate students' proactive learning

interest.b) Role-playing Method: Students assume roles such as transport administrators, corporate representatives, and ordinary passengers to simulate transport economic decision-making processes, enhancing their comprehension of transport economic issues.c) Field Study Approach: Arrange visits to transportation facilities such as high-speed rail stations and logistics centres, integrating theoretical knowledge with practical application.d) AI-assisted teaching: Utilise AI tools such as DeepSeek to provide students with personalised learning support and ideological guidance, enhancing teaching efficiency and relevance.

2.5 Assessment Phase: Establishing a Multi-dimensional Evaluation System

During the assessment phase, a four-dimensional evaluation framework was established. The assessment methodology employs a combined approach of formative and summative evaluation, focusing not only on learning outcomes but also prioritising the enhancement of ideological and political literacy throughout the learning process.a) Knowledge Mastery Assessment: Evaluates students' grasp of fundamental transport economics theories through online tests and classroom questioning.b) Capability Development Assessment: Evaluate students' ability to apply theoretical knowledge to solve practical problems through case analysis reports and practical project outcomes.c) Value Internalisation Assessment: Examining students' identification with and internalisation of ideological and political elements through reflective journals and group discussion participation.d) Comprehensive Quality Assessment: Evaluated students' collaborative abilities, innovative spirit, and overall competencies through teamwork performance and demonstrations of creative thinking.

III. TEACHING PRACTICE AND EFFECTIVENESS ANALYSIS

3.1 Exemplary Case: "Witnessing China's Railway Development, Forging the Aspiration for a Transport Powerhouse"

This case study was implemented within the "Passenger Transport Demand" chapter of the Transport Economics course, following this specific sequence. In the pre-class phase, students studied foundational theories of transport demand and supply via an online platform, viewed videos chronicling China's high-speed rail development, engaged in pre-course ideological and political elements exploration, and submitted a pre-class reflection question: "How does China's high-speed rail development exemplify the advantages of the national system?" In the in-Class Phase, the lecturer explains the core concepts of transport demand theory. Students engage in group discussions on the economic principles and ideological elements within China's high-speed rail construction. A themed debate on "Youth Responsibility in Building a Transport Powerhouse" is then organised. In the post-class stage, students write an analytical report on "China's High-Speed Rail Development and the Advantages of the Socialist System," participate in the practical activity "Proposing a Strategy for My Hometown's Transport Development," and complete a course ideological and political learning reflection journal.

3.2 Implementation Outcomes

Following two semesters of teaching practice, this pedagogical model has yielded significant outcomes.At the student level, the average grade in specialised courses increased by 12.5%, with 86.7% of students reporting a marked rise in interest towards the study of transport economics. Furthermore, 92.3% expressed significantly heightened recognition and pride in the nation's achievements in transport development. At the faculty level, specialist teaching staff demonstrated markedly heightened ideological and political awareness alongside improved pedagogical capabilities. A shared understanding emerged that "specialist lecturers bear primary responsibility for integrating ideological and political education into their courses," alongside the development of a comprehensive repository of teaching resources for this purpose. At the course level, the Transport Economics course was designated a university-level flagship course, with its teaching plan recognised as a model example. A replicable and scalable teaching model for integrating ideological and political education into the curriculum has been established, applicable to other courses within the discipline.

IV. CONCLUSIONS AND OUTLOOK

4.1 Research Findings

Integrating the ADDIE model into the ideological and political education of the Transport Economics course, and achieving the deep integration of "knowledge transmission + value guidance" through blended learning, offers the following advantages:

- a) Systematic Approach: The ADDIE model provides a comprehensive instructional design framework, ensuring the systematic and coherent integration of ideological and political education into the course.
- b) Precision: Through precise positioning during the analysis phase, ideological and political elements are organically integrated with professional knowledge, avoiding forced incorporation.
- c) Flexibility: The blended learning approach allows for adaptable adjustments based on teaching realities, catering to diverse student learning needs.
- d) Effectiveness: A multi-dimensional evaluation system ensures the measurable outcomes and continuous improvement of ideological and political education implementation.

4.2 Future Outlook

- a) Deepening Ideological and Political Element Exploration: Further enrich course-based ideological and political content by integrating national strategies such as the "dual carbon" goals and the Belt and Road Initiative.
- b) Expanding Teaching Resource Development: Strengthen university-industry collaboration to develop more case resources reflecting the latest industry developments.
- c) Innovating Evaluation Mechanisms: Explore effective pathways to incorporate students' ideological and political literacy into comprehensive quality assessments, establishing a more scientific evaluation system.
- d) Enhancing Faculty Training: Continuously conduct training programmes to enhance teaching staff's ideological and political theory proficiency and pedagogical capabilities.

The blended teaching approach for the Transport Economics course, designed using the ADDIE model, has not only facilitated the effective transmission of professional knowledge but also subtly achieved value guidance. This provides an effective pathway for cultivating well-rounded builders of a transport powerhouse and offers valuable insights for ideological and political development in other specialised courses.

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