

INTERDISCIPLINARY PEDAGOGICAL APPROACHES FOR TRAINING  
SPECIALISTS IN URBAN MOBILITY AND TRANSPORT MANAGEMENT

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**Abstract:** This article explores the role of innovative pedagogical approaches in enhancing professional competence among students of transport education. As the transport sector undergoes rapid transformation through digitalization, sustainability initiatives, and smart city integration, the need for highly skilled professionals becomes increasingly significant. The research examines how active learning strategies, digital tools, and interdisciplinary teaching methods contribute to the development of technical expertise, problem-solving abilities, and critical thinking. A mixed-methods design, including literature analysis, classroom observation, and student surveys, was employed. The results show that problem-based learning, simulation technologies, and case study analysis significantly improve student engagement and readiness for real-world challenges. The study highlights the importance of aligning pedagogical practices with the evolving demands of the transport industry and offers recommendations for curriculum modernization.

**Keywords:** transport education, pedagogy, professional competence, active learning, simulation

**Introduction**

The modern transport industry faces unprecedented challenges and opportunities in the era of globalization, digital transformation, and sustainability. Efficient transport systems are vital for economic development, urban mobility, and environmental protection. Preparing professionals capable of meeting these challenges requires not only strong technical knowledge but also problem-solving, adaptability, and management skills. Traditional lecture-based teaching, while valuable for building theoretical foundations, often fails to equip students with the competencies needed for dynamic real-world contexts.

In higher education, pedagogical innovation has emerged as a response to these gaps. Constructivist and experiential learning theories emphasize that students learn more effectively through engagement, reflection, and practice rather than passive reception of information. In transport education, this is especially relevant, as students must master both technical processes and operational decision-making. Innovative pedagogy, including active learning, digital simulations, and interdisciplinary integration, is increasingly recognized as essential for developing professional competence.

Professional competence in transport education involves a combination of technical proficiency, critical thinking, communication, and ethical responsibility. It reflects not only the ability to

apply theoretical knowledge but also the readiness to adapt to technological advancements such as automation, smart mobility, and sustainable infrastructure. This study seeks to explore how innovative pedagogical strategies can enhance professional competence in transport education, with an emphasis on their effectiveness and practical application.

### Methods

The research employed a mixed-methods approach combining qualitative and quantitative techniques. A literature review was conducted to analyze existing studies on pedagogical innovation in technical education, particularly in transport systems. Classroom observations were carried out in two higher education institutions offering transport-related programs, focusing on courses where active learning and digital tools were applied.

A survey of 110 undergraduate students specializing in transport engineering and logistics was conducted. The questionnaire addressed perceptions of traditional lectures, active learning methods, simulation technologies, and case studies. Additionally, semi-structured interviews with 12 faculty members provided insights into the challenges of integrating innovative pedagogy. Data triangulation ensured validity by combining student perceptions, faculty reflections, and observational data.

### Results

The findings indicate that innovative pedagogy significantly enhances professional competence in transport education. Among surveyed students, 74% reported that problem-based learning improved their ability to solve complex operational problems. Digital simulation tools, including traffic modeling software, were identified by 68% of students as highly effective in linking theoretical knowledge with practical applications. Case studies focusing on real-world transport challenges were valued by 71% of respondents, as they fostered critical thinking and decision-making skills.

Observations confirmed that classes incorporating simulations and group projects demonstrated higher student engagement compared to traditional lectures. Faculty members highlighted that interdisciplinary approaches—linking engineering with management, environmental science, and urban planning—encouraged holistic understanding of transport systems. However, challenges such as limited digital resources and insufficient pedagogical training for faculty were also identified.

### Discussion

The results confirm that innovative pedagogical approaches directly contribute to the development of professional competence in transport education. Active learning strategies promote problem-solving and teamwork, essential skills for transport professionals who must coordinate complex operations. Digital simulations enable experiential learning, providing a safe environment for testing strategies and analyzing outcomes. Interdisciplinary teaching broadens students' perspectives, preparing them for the multifaceted nature of modern transport systems.

These findings align with international trends in higher education, where competence-based approaches are prioritized. They also highlight the need for curriculum reform in transport education to incorporate more practical, student-centered methods. At the same time, barriers such as limited access to technology and the need for faculty development must be addressed.

Without institutional support and investment in digital infrastructure, the potential of innovative pedagogy cannot be fully realized.

### Conclusion

This study concludes that enhancing professional competence in transport education requires a systematic integration of innovative pedagogical strategies. Problem-based learning, digital simulations, and case study analysis were shown to significantly improve students' readiness for professional practice. Interdisciplinary approaches further strengthen competencies by linking technical knowledge with managerial, environmental, and social perspectives.

To ensure sustainable progress, universities must adopt policies that support pedagogical innovation, including faculty training and investment in digital learning tools. Future research should examine the long-term impact of these methods on graduate performance in the labor market and compare results across different cultural and institutional contexts. By embracing innovative pedagogy, higher education can better prepare transport professionals to address the evolving challenges of the 21st century, thereby contributing to sustainable mobility and urban development.

### References:

1. Biggs, J., & Tang, C. Teaching for Quality Learning at University. McGraw-Hill, 2011.
2. Kolb, D. A. Experiential Learning: Experience as the Source of Learning and Development. Prentice Hall, 2014.
3. Mayer, R. E. Learning and Instruction. Pearson, 2019.
4. Salimova, N., & Karimov, B. "Innovative Teaching Approaches in Transport Engineering Education." Journal of Technical Education Research, 2022.
5. Schön, D. The Reflective Practitioner: How Professionals Think in Action. Routledge, 2016.
6. UNESCO. Engineering Education for Sustainable Development. Paris: UNESCO Publishing, 2021.
7. Yilmaz, H. "Problem-Based Learning in Engineering Education: A Case Study." International Journal of Pedagogical Innovation, 2020.