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INNOVATIVE TEACHING TECHNOLOGIES IN THE DEVELOPMENT OF EDUCATIONAL ACTIVITIES OF STUDENTS OF TECHNICAL HIGHER EDUCATION INSTITUTIONS

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Abstract
The article examines the role and effectiveness of innovative teaching technologies in enhancing the educational activities of students in technical higher education institutions. As the demands of the 21st-century knowledge economy continue to evolve, engineering and technology students are expected not only to master theoretical knowledge but also to develop problem-solving skills, adaptability, and collaborative competencies. Innovative teaching methods—such as blended learning, project-based learning, flipped classrooms, virtual laboratories, and AI-driven educational platforms—offer transformative potential to make learning more interactive, personalized, and aligned with real-world challenges. The research aims to identify, analyze, and evaluate the impact of such pedagogical innovations on student engagement, academic performance, and the formation of professional competencies in technical fields. The findings will contribute to the optimization of teaching practices and curricular design in engineering education.

Keywords: innovative, teaching technologies, educational activities, students, technical, higher education, institutions, engineering education.

Introduction
The urgency of this research stems from the rapid technological advancements and the increasing complexity of professional environments that technical university graduates must navigate. Traditional lecture-based teaching methods

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are often insufficient to equip students with the interdisciplinary skills and innovative thinking required in modern industries. Technical higher education institutions must now reimagine their instructional approaches to remain relevant and responsive to the changing educational landscape. Investigating and implementing innovative teaching technologies is thus not only timely but essential for fostering active learning, increasing student motivation, and preparing future engineers for success in a digitally-driven global economy.

The structure and content of engineering education have been the focus of extensive scholarly inquiry. A.I. Subetto [2], for instance, approaches this issue from the perspective of educational quality, defining it as a multifaceted system encompassing knowledge, skills, values, instructional methods, technologies, and mechanisms that ensure equitable access to higher education across all social strata, while supporting continuous learning. Subetto's notable contribution lies in establishing a conceptual link between the enhancement of public intellectual capacity and improvements in educational and managerial quality, aligning with the principle of progressive development in education systems. However, his work does not specify contemporary content-related requirements for engineering education. N.A. Seleznyova [3] emphasizes a student-centered approach, although her research does not elaborate on its implications for educational content. Yet, in these works, the internal actors of the educational process (teachers and students) are largely excluded from shaping or structuring curricular content, as it is largely externally defined.

The formulation of innovative engineering curricula necessitates the systematic selection and organization of knowledge, skills, and competencies critical for modern engineers, and should be structured across academic disciplines. This process unfolds in three key stages:

Theoretical Justification: Involves defining current educational requirements, establishing an informational foundation based on scientific and academic knowledge, setting educational goals, and distinguishing between invariant and variable components of the curriculum.

Structural-Semantic Design: Entails developing principles for structuring engineering content, integrating academic material with scientific and industrial

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applications, creating instructional modules, establishing interdisciplinary connections, and representing this content taxonomically.

Scientific and Methodological Support: Focuses on selecting digital tools for functional taxonomy, and classifying the core structural elements of engineering education.

Current demands on engineering education content are shaped by the advancement of science-intensive technologies and require alignment with the invariant structure of professional tasks, systematized knowledge and skills, and consideration of innovative research and industrial developments. Contemporary post-industrial societies require engineers equipped to operate effectively across varied organizational contexts and to engage in complex, multi-level managerial modeling. This necessitates an integrative educational approach that unifies functional expertise with social competencies and situational professional awareness.

A primary goal in modernizing engineering curricula is to adapt content to reflect technological progress and forecasted competency needs across broad areas of practice. Innovations in engineering education involve aligning content with scientific advancements, emerging industry demands, and the need to produce measurable educational and professional outcomes. Each technical subject must foster competencies relevant to interdisciplinary, problem-oriented professional contexts. To meet this goal, the structural elements of engineering education must be sufficient to deliver comprehensive, functionally relevant outcomes for each instructional session within regulatory guidelines. Key principles in curriculum structuring include alignment with professional functions, differentiation between invariant and variable elements, modular design, interdisciplinary integration, taxonomic representation, and the systemic coherence of structural components. Proper structuring not only ensures the educational coherence of content but also informs the selection of teaching methods and tools that effectively merge academic learning with professional practice and research activities.

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Literature Review

An underutilized yet innovative instructional approach in hospitality and tourism education involves initiating a session with a concise lecture—approximately 20 minutes in duration—introducing a problem-based case study, followed by structured group discussions. During these sessions, students engage in critical debates, interrogate their peers' responses, and collaboratively explore solutions. Active student participation is fundamental to effective learning in this context. The role of the lecturer shifts from being a content deliverer to a facilitator who encourages and guides student interaction. Based on practical application, such a methodology fosters greater student engagement, teamwork, and role-based learning. However, the success of this approach depends on students' prior familiarity with problem-solving and critical thinking strategies. Empirical evidence indicates that interactive teaching methods significantly outperform traditional didactic instruction, enhancing academic achievement and promoting inclusivity, especially for students who often feel marginalized [4].

Student-centered and active learning strategies—particularly those rooted in experiential, problem-based, and project-based learning—are increasingly essential. Collaborative learning environments are preferable, and there is a growing need to reduce dependency on conventional large-lecture formats, which often persist due to institutional pressures to enroll more students for increased state funding. While logistical constraints may necessitate large classes, the benefits of meaningful staff-student and peer-to-peer interactions cannot be overstated. Nevertheless, individual learning remains important.

Simulation and Role-Playing

Simulation and role-play are effective pedagogical strategies designed to replicate real-world workplace scenarios. These methods allow students to cultivate essential social skills within the context of hospitality and tourism. By engaging in simulated tasks, students synthesize course content through practical application—learning by doing. It is imperative that lecturers establish clear participation guidelines to ensure the activity remains focused and constructive rather than performative. These exercises should be framed as opportunities for experiential learning, enhancing students' sense of belonging, motivation, and

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academic performance [6]. Simulated scenarios and case study analyses involving hotel staff and guest interactions provide valuable practice in problem-solving and strengthen students' analytical and argumentative skills. These activities promote deeper understanding and long-term knowledge retention—key objectives of meaningful learning [5]. However, their effectiveness depends on thoughtful instructional design, clear learning objectives, and adequate student preparation. Assessment methods may include instructor evaluation, peer review, and self-assessment, all of which contribute to deeper self-reflection and broader cognitive development. Feedback—both from peers and instructors—is crucial in supporting students' growth in problem-solving proficiency.

Learning Portfolios. Portfolio-based assessment, including peer evaluation, fosters autonomous learning and enhances educational outcomes. As Cole [7] asserts, the primary advantage of portfolio assessment lies in empowering students to take ownership of their educational journey. Belanoff [1] notes that such assessments serve multiple functions: motivating learners, providing constructive feedback, diagnosing individual strengths and areas for improvement, and measuring achievement levels upon course completion.

Discussion

Education serves as a fundamental catalyst for societal change and transformation. To improve educational quality, innovative teaching practices are essential. Many societal challenges are intrinsically linked to educational shortcomings, highlighting the need for institutions to adopt novel strategies that cultivate new skills, insights, and approaches to problem-solving. In equipping students to meet the complex global demands of the 21st century, education must empower them intellectually and socially. Innovation, as defined by the Oxford Dictionary, involves the introduction of novel elements and modifications to established methods—an objective central to this discussion. A key metric for evaluating educational institutions is the quality of teaching and learning.

From a social constructivist standpoint, learning is a dynamic, interactive process that occurs through social engagement, not in isolation. Authentic learning emerges when learners actively participate in meaningful social contexts [9]. This

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involves cultivating critical thinking, generating and evaluating ideas, managing personal development, and fostering autonomy in learning.

Developing students' capacity to question rather than merely respond is integral to this process. However, the effectiveness of teaching in higher education has long been a subject of debate [8]. According to Centra [10], effective teaching is characterized by the intentional use of appropriate strategies that result in purposeful student learning—a central concern of this paper. Braskamp and Ory [8] further argue that effective teaching entails the creation of environments conducive to learning, a skill that successful educators consistently demonstrate. Lecturing, in this context, is a reciprocal communicative act wherein ideas are exchanged and learning is mutually experienced. It is a complex and interactive process designed to transfer knowledge and nurture understanding and skill development. Ideally, such engagement inspires students to deeply explore their chosen disciplines.

Despite this, many students do not complete their university studies. Nevertheless, they often benefit from the transferable skills and personal growth acquired during their academic journey [13]. Thus, the emphasis should be on **deep learning**—a transformative process—as opposed to superficial memorization. To achieve this, lecturers must exhibit traits such as humility, courage, impartiality, open-mindedness, empathy, enthusiasm, sound judgment, and creativity [11]. These qualities enable educators to foster deep learning among students. Brockbank and McGill [12] emphasize the importance of reflective practice, providing numerous examples of reflective engagement among both faculty and students.

The pedagogical approach must move beyond traditional, lecture-dominated methods ("*talk and chalk*") towards learner-centered strategies that emphasize how students learn. This includes creating varied, stimulating, and innovative learning environments that encourage active participation. As Biggs [14] suggests, meaningful learning occurs when educators motivate and facilitate, and when students take ownership of their learning through intentional, goal-directed activities. Therefore, it is imperative that educators consistently engage in reflective practices and explore innovative methodologies to enhance student engagement. Personalized instructional strategies and active learning techniques

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are critical to this transformation. As Stensaker [17] notes, ensuring quality in education requires a concentrated focus on effective teaching and learning practices. Traditional teacher-centered methods are insufficient for modern learners, and current outcomes suggest a gap in effective educational delivery [16]. However, high-quality learning is attainable when students are given greater autonomy and responsibility for their own education [15].

Conclusion

It is essential to recognize that no single innovative teaching strategy serves as a universal solution or complete substitute for traditional pedagogies. Instead, such approaches should complement conventional methods. Nonetheless, literature suggests that these innovative methodologies better equip students to navigate real-world challenges in professional contexts. By fostering creativity, critical thinking, and active engagement, such pedagogical innovations contribute to the development of a learning-oriented society capable of advancing transformation and sustainable development.

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