



Increasing Scientific Research Activity Of Students Of Technical Universities Through Engineering Competitions And Quizzes, The Path To Innovative Educational Technologies.

Noiba Nomozova
Zayniddinovna

Tashkent State Technical University named after Islam Karimov
Doctoral student of the Department of Pedagogy and Psychology

ABSTRACT

This article examines the importance of engineering competitions and quizzes in developing research activities among students of technical universities. By integrating innovative teaching technologies such as practical projects and experiential learning, students have the opportunity to improve their problem-solving, critical thinking skills, and practical knowledge. The article highlights the benefits of engaging students in extracurricular activities that develop research-oriented thinking, ultimately contributing to a well-rounded education in engineering.

Keywords:

research activities, technical universities, engineering competitions, quizzes, innovative teaching technologies, student development, experiential learning

Introduction:

Technical universities play a crucial role in preparing the next generation of engineers and innovators. While traditional classroom instruction forms the foundation of academic learning, it is equally important to provide students with opportunities to engage in research activities that complement their theoretical knowledge with practical experience. Engineering competitions and quizzes provide a valuable platform for students to apply classroom learning to real-world problems, fostering a culture of innovation and inquiry-based research.

Strengthening Research Through Engineering Competitions:

Engineering competitions provide a unique opportunity for students to collaborate, innovate, and solve complex problems in a competitive environment. These activities often involve designing and building prototypes, conducting experiments, and presenting

findings to a panel of judges. By participating in such competitions, students not only apply theoretical concepts in a practical setting, but also develop important skills such as teamwork, communication, and project management.

In addition, engineering quizzes provide a platform for students to test their understanding of key engineering principles and theories. These quizzes challenge students to think critically, analyze problems, and apply their knowledge to effectively solve complex problems. By participating in quizzes regularly, students can consolidate their knowledge, identify areas for improvement, and enhance their problem-solving skills.

Integrate innovative learning technologies: Innovative learning technologies play a critical role in enriching the learning experience of students in technical universities. Hands-on projects, virtual simulations, and interactive learning platforms provide students with immersive learning experiences that

complement traditional classroom instruction. By integrating these technologies into the curriculum, teachers can support diverse learning styles, increase student engagement, and deepen their understanding of complex engineering concepts.

In addition, experiential learning opportunities such as internships, research projects, and industry collaborations allow students to apply theoretical knowledge to real-world scenarios. By engaging in practical projects and research activities, students develop practical skills, critical thinking skills, and a passion for scientific inquiry. These experiences not only enhance classroom learning, but also prepare students for successful careers in engineering. Evaluating the impact of innovative learning methods such as practical projects, virtual simulations, and experiential learning opportunities on students in technical universities is essential to assessing the effectiveness of these approaches. Some strategies for evaluating the impact of these learning methods include:

1. Quantitative Assessment:

- Pre- and Post-Tests: Administer pre- and post-tests to measure changes in students' knowledge and skills before and after engaging in a learning activity.
- Surveys: Administer questionnaires to collect students' feedback on their learning experiences, improvements, and overall satisfaction with the learning methods.
- Performance Measures: Analyze students' performance on assignments, projects, quizzes, and exams to assess their understanding of concepts and application of knowledge.

2. Qualitative Assessment:

- Focus Groups: Conduct focus group discussions with students to gain a deeper understanding of their experiences, challenges, and benefits of the learning methods.
- Interviews: Conduct interviews with students, teachers, and industry experts to gain insight into the impact of learning methods on student skills development and workforce readiness.
- Observations: Observe students during practical projects, simulations, and other experiential learning activities to assess their

engagement, problem-solving, and collaboration skills.

3. Assessing Long-Term Impact:

- Observational Studies: Conduct follow-up studies with graduates to track their career progression, the application of skills learned through these learning methods to their careers, and their overall success.
- Employer Feedback: Collect feedback from employers who hire technical university graduates to understand how well prepared students are in terms of practical skills, critical thinking, and adaptability.

4. Comparative Analysis:

- Controlled Studies: Comparing the academic performance and skill development of students who engage in innovative learning methods with those who follow traditional teaching methods.
- Benchmarking: Comparing the results of students participating in experiential learning activities with industry standards and best practices to assess the relevance and effectiveness of these methods.

5. Review and Iterative Improvement:

- Identifying areas for improvement in learning methods using ongoing feedback from students, faculty, and industry partners.
- Iterating the curriculum and learning activities based on evaluation results to increase the impact and effectiveness of these methods over time.

By using a combination of quantitative and qualitative evaluation methods, conducting long-term impact studies, comparing results, and seeking feedback for iterative improvements, educational institutions can effectively assess the impact of innovative teaching methods on technical university students.

Conclusion:

In conclusion, engineering competitions and quizzes serve as valuable tools for enhancing research activity among technical university students. By integrating innovative teaching technologies and experiential learning opportunities, educators can help students develop critical skills, foster a spirit of inquiry, and foster a passion for innovation. By actively participating in extracurricular activities that

promote research-oriented thinking, students are better equipped to solve the challenges of the modern engineering landscape and make meaningful contributions to the field.

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