

**Innovative and Inclusive Academia Symposium - 19th and 20th October 2023 – Marco Biagi Foundation
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Title: Team-Based Learning in Aerospace Engineering Education: Fostering Collaboration, Inclusivity, and long-term Knowledge Retention

Category: Practitioner/Case Study Presentation (10 Mins)

Main Topic: Experiences on TBL implementation to foster inclusion.

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Abstract: Aerospace engineering education demands innovative approaches to prepare students for the complexities of the industry. Team-Based Learning (TBL) offers a solution by cultivating active learning, critical thinking, and teamwork. This abstract explores TBL's integration in aerospace engineering education, emphasizing its impact on student engagement, knowledge retention, and collaborative skills and fostering a more inclusive learning environment.

TBL addresses the multidisciplinary nature of aerospace through team collaboration on authentic engineering problems. The readiness assurance process is central, involving pre-class individual study, team assessments, and peer discussions. This fosters critical thinking and justifying solutions, replicating real-world aerospace scenarios.

One notable advantage of TBL is its positive impact on long term knowledge retention. Collaborative activities and peer interactions facilitate deeper understanding and memory consolidation, contributing to a solid foundation—an essential aspect of aerospace education.

Moreover, Inclusive TBL addresses diversity-related challenges often present in STEM fields. By encouraging diverse perspectives, it creates a space where underrepresented students feel valued and heard. Collaborative tasks also provide opportunities for students to learn from each other's unique experiences and backgrounds, enriching the learning process.

This work describes an innovative training experience carried out as part of the Learning to Teach (L2T) project at the Politecnico di Torino. L2T is a Faculty Development project which basically includes three steps: a longitudinal course aimed at developing the teaching skills of university lecturers, the experimentation of new forms of teaching/learning and the coaching of the experimenting lecturers. The article reports on the experience of a senior lecturer at the Politecnico who, after completing the L2T course, has decided to introduce a collaborative teaching strategy, Team Based Learning (TBL), into his aerospace engineering course.

The work will describe the context of the Politecnico di Torino, the features of TBL, the experimentation carried out by the faculty member and the results achieved by the students. This article highlights the virtuous circle that can be implemented by training, experimentation, scientific thinking, and communication, in other words, how Faculty Development initiatives can produce changes in the attitudes of lecturers and also encourage activities of reflection and research on university training, giving rise to processes of scholarship of teaching and learning.