MAFFIOLI AWARD 2024 – NOMINATION OF TOM BØRSEN, AALBORG UNIVERSITY

Associate Professor Tom Børsen's tenure at Aalborg University has been marked by a profound commitment to evolving the landscape of engineering education through an interdisciplinary approach. Recognizing the increasing necessity for engineers to possess a broad spectrum of skills and ethical awareness, Tom pioneered the Techno-Anthropology program. This program seamlessly integrates social sciences and humanities (SSH) into engineering curricula, underscoring the relevance of ethical considerations and cultural contexts in technical disciplines.

The rationale behind this integrative approach stems from the need to prepare engineering students not just as technical experts, but as global citizens capable of navigating and solving complex societal challenges. The Techno-Anthropology program, developed under Tom's leadership, is based on the conviction that modern engineering problems require holistic solutions that SSH disciplines can provide. By incorporating these perspectives into engineering education, the program aims to produce more well-rounded, socially responsible engineers.

Tom’s initiatives also respond to regional and national educational priorities that emphasize innovation and adaptability in higher education frameworks. His curriculum design reflects a strategic alignment with these broader educational goals, ensuring that graduates are not only technically proficient but also adept at engaging with diverse, interdisciplinary teams and contexts.

Tom Børsen's work exemplifies a forward-thinking approach to engineering education, one that champions inclusivity, interdisciplinary understanding, and ethical reflection—qualities essential for the next generation of engineers.

TECHNO-ANTHROPOLOGY

Tom Børsen played a pivotal role in the founding group that developed Techno-Anthropology, an interdisciplinary study program that melds engineering, ethics, and anthropology. The foundational concept of the program and the skills it aims to cultivate are encapsulated by the Techno-Anthropological Triangle, initially introduced in the 2013 book "What is Techno-Anthropology?" edited by T. Børsen and L. Botin, and subsequently explored in various academic publications.

During his tenure as head of the Study Board for Techno-Anthropology (2011-2013; 2015-2021), Tom was instrumental in overseeing the program, coordinating numerous semesters, and managing both course and project modules. His analysis of the master's program's curriculum in the chapter "Bridging Engineering and Humanities at Techno-
Anthropology highlights the curriculum's role as a boundary object. This characteristic allows it to be flexibly interpreted, making it accessible and relevant to both engineers and SSH practitioners. Tom argues that successful interdisciplinary study programs should maintain a robust narrative supported by all stakeholders—including university management, faculty from various disciplines, employers, and students—and remain adaptable to the specific interpretations and needs of these diverse groups.

The Techno-Anthropology master's program at Aalborg University brings together engineers, health professionals, and anthropologists, necessitating continuous collaboration among students from these varied disciplines throughout their projects each semester. Bridging these diverse academic backgrounds is challenging. To address these challenges, Tom Børsen initiated a project titled "Promoting Interdisciplinary Qualification in Techno-Anthropology through Problem-Based Learning." He also co-authored the book "Interdisciplinary Competences in the Study-Program of Techno-Anthropology." In this work, he, and his co-authors propose fourteen strategies to navigate and overcome these interdisciplinary thresholds. These strategies include joint PBL seminars, poster presentations, visits to companies, alcohol-free social events, online onboarding sessions, small group exercises, the use of exemplary case studies, and encouraging participation in public events.

The authors advise educators involved in heterogeneous programs to adapt and possibly reinterpret the curriculum to ensure it resonates with all participating students. They emphasize leveraging the Problem-Based Learning approach, which centers on real-world problems to facilitate meaningful learning, and advocate for the use of innovative teaching methods and pedagogical creativity to enhance educational outcomes.

**ONLINE ONBOARDING**

The aforementioned project advocates for the introduction of online onboarding processes. During 2020 and 2021, Tom Børsen actively participated in the creation of two online courses aimed at enhancing the induction of new students. One course was designed to acclimate engineering students to the master's program in Techno-Anthropology, while the other prepared PhD students for a course on ethics and responsible innovation in science and engineering.

In a paper presented at the 2021 SEFI conference, Tom Børsen and J. Contreras shared insights from their experience in developing these online courses. They highlighted the benefits of involving teachers early in the course design process and adopting a collaborative and democratic approach to decision-making. They also emphasized the importance of exploring various e-learning platforms to select an appropriate and locally supported format. They recommended a consistent structure across all modules to help students quickly acclimate to the learning environment and to streamline content production.

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1 Børsen, T. (2022). Bridging Engineering and Humanities at Techno-Anthropology. In S. H. Christensen, A. Buch, E. Conlon, C. Didier, C. Mitcham, & M. Murphy (Eds.), *Engineering, Social Sciences, and the Humanities: Have Their Conversations Come of Age?* (pp. 151–177). Springer International Publishing. [https://doi.org/10.1007/978-3-031-11601-8_8](https://doi.org/10.1007/978-3-031-11601-8_8)


Tom concluded that online courses are highly effective when used in conjunction with traditional classroom instruction. They provide a foundation for in-person learning and allow students to review essential knowledge beforehand, enhancing the overall learning experience.

ENGINEERING ETHICS EDUCATION

A key aspect of Tom Børsen’s integrative engineering approach is Engineering Ethics Education (EEE), where ethical considerations are seamlessly integrated into engineering curricula. Tom has developed and implemented EEE courses across undergraduate, graduate, and postgraduate levels. He is an active member of the Steering Committee for SEFI’s Ethics Special Interest Group (SIG). In May 2022, Kate Roach and Tom hosted a “SEFI at work” online workshop focused on Responsible Innovation in Engineering Education, the recording of which is available on YouTube.

In 2021, alongside Shannon Chance, Tom initiated one of the most significant projects in the history of the SIG: the creation of “The Routledge International Handbook on Engineering Ethics Education.” This ambitious project aims to compile and disseminate existing knowledge on EEE to educators and researchers at all levels. The handbook spans 36 chapters in six sections and includes contributions from 108 scholars active in the EEE community. This publication has also served as a catalyst for the growth and evolution of the EEE research community. The manuscript has been accepted for publication and submitted to the publishers.

Tom’s reflections on the project underline that the EEE community is thriving and robust. He emphasizes that effective engineering ethics education should begin with practical engineering scenarios, deeply intertwined with comprehensive descriptions of contextual factors—such as emotional, economic, and cultural settings—and linked to ethical frameworks. He advocates for the implementation of diverse pedagogical strategies, ensuring that learning objectives and assessments align, and suggests that accreditation processes should reflect a nuanced and in-depth understanding of EEE.

IN SUMMATION

Tom Børsen is an ideal candidate for the Maffioli Award due to his pivotal role in integrating interdisciplinary studies into engineering education at Aalborg University. As a founder of the Techno-Anthropology program, he has effectively blended engineering with ethics and anthropology, preparing students to become globally aware engineers capable of addressing complex societal issues.

Under Tom’s guidance, this innovative program aligns with educational priorities that emphasize adaptability and innovation, using problem-based learning to effectively integrate diverse student backgrounds. He has also been instrumental in developing online courses that enhance the learning process, helping students transition smoothly into interdisciplinary studies.

Additionally, Tom has significantly contributed to Engineering Ethics Education, integrating ethical considerations into curricula across all levels of study and leading influential projects like the Routledge International Handbook on Engineering Ethics Education. This work not only advances educational practices but also enriches the engineering ethics community.

Through his dedication and innovative approaches, Tom Børsen has made a lasting impact on engineering education, embodying the transformative leadership that the Maffioli Award recognizes.
SIGNATURES

Anne Merrild Hansen
Professor, Head of Department
Department of sustainability and Planning

Pernille Bertelsen
Professor, Head of Studies
Department of sustainability and Planning

Louise Møller Haase
Vice-dean for studies
Technical Faculty of IT and Design