

ICL2025 Special Session Call for Papers

Reimagining Engineering and Applied Curriculum for Transformation in Africa (REACT-Africa)

Overview

The growing demands of the job market and the imperative to achieve Sustainable Development Goals (SDGs) have heightened the pressure on Africa's education system, posing challenges for training future engineers. This is especially pertinent given the region's distinct infrastructure and needs. Engineering education in Africa should equip students with technical expertise while preparing them to adapt to rapid societal, industrial, and technological changes that differ from those in Europe.

The special session, "REACT-Africa," will delve into teaching, learning, and curriculum structures that can enhance engineering education in resource-limited environments, such as those in African nations. It will investigate how higher education institutions (HEIs) can support the 'learning by doing' approach, offering engineering students access to knowledge, hands-on experiences, collaborative opportunities, and systems of engagement. This will prepare future African engineers to effectively contribute to their communities and economies, addressing local challenges and meeting the evolving demands of the job market. The session will explore the role and effectiveness of Problem-based Learning (PBL) and Project-based Learning (PjBL), alongside other active learning methodologies, as strategies for equipping engineers to address real-world challenges. These approaches connect theoretical knowledge with practical skills, ensuring that educational outcomes meet industry demands. The focus will be on training and curriculum innovation that supports the principles of Education 5.0: integrating technology, fostering innovation, and achieving societal impact. This special session advocates for a revival of applied, solutions-focused education, drawing on the practical, hands-on values of 19th-century learning while integrating the technological advancements of the 21st century. It highlights the essential task of equipping African engineers to be ready for industry demands and to contribute to creating inclusive futures for their communities. We seek research papers, case studies, institutional strategies, and literature reviews that investigate current initiatives, obstacles, and future directions in the transformation of engineering education across Africa.

Topics

The special session REACT-Africa will address topics including, but not limited to:

- Innovation in engineering education and research
- *Problem-Based and Project-Based Learning (PBL/PjBL)*
- *Industry-academic collaboration and stakeholder engagement*
- *Engineering education for sustainable development*
- *Technology and digital learning in resource-constrained contexts*
- *Curriculum design for African needs and local relevance*
- *Diversity, inclusion, and gender equity in engineering programs*

- *Developing future-ready skills: creativity, critical thinking, adaptability*
- *Teacher training and effective methods for technical instruction*
- *Personalized learning models and Education 5.0*
- *Case studies and success stories from African institutions*

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