

# The Concept of Failure in Engineering Education – A Transdisciplinary Perspective

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**Abstract.** Research into engineering education covers models, methods and approaches to characterise, measure and improve teaching and/or learning performance. The majority of the academic state of the art focuses on how to improve performance based on an understanding of critical success factors for engineering education, which is itself based on underlying models of learning as a process of knowledge acquisition, retention, application and sublimation into ‘higher-level’ learning outcomes. The state of the art covers both qualitative and quantitative methodological approaches, with a strong focus on characterising and measuring learning outcomes. However, while success factors have been identified, much less attention has been paid to what can go wrong in engineering education. This paper aims to provide an initial definition and typology of failure in engineering education, based on a transdisciplinary approach involving concepts and methods from reliability engineering and (engineering) education. Subsequently, avenues for future modelling, testing and application of the concept of failure are explored.

**Keywords.** engineering teaching and learning, engineering education, failure, transdisciplinary engineering education

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