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# Editorial: The psychology of STEM education

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## Editorial on the Research Topic The psychology of STEM education

Welcome to this Research Topic that explores the complex intersections of STEM disciplines and educational psychology, transcending the boundaries of education. Our focus in this Research Topic is to explore the psychological dimensions of learning in STEM disciplines. Students' attitudes, motivations, likes, enjoyment, attention, and anxiety in relation to STEM Education are some of the important psychological factors that affect the quality of teaching and learning. They also help educators to distinguish dissimilar and struggling learners in STEM disciplines across all grade levels from preschool to higher education. As a result of the rapid growth and change of technology and the economy, it is predicted that many of the future professions do not exist today and that existing professions will undergo significant changes or will disappear. In a world where STEM capabilities are becoming increasingly vital for economic growth, innovation and sustainability, understanding the psychological dimensions of learning becomes imperative.

As guest editors, we are excited to present a collection of articles that not only explore areas of STEM education but also venture into the fascinating confluence of educational psychology.

In this Research Topic, the first article, by [Scheirlinckx et al.](#), sets the stage by unraveling the social-emotional skills (SEMS) of teachers, a crucial aspect not only for academic success but also for the psychological wellbeing of students. It underscores the importance of educators possessing the emotional intelligence needed to navigate the challenges inherent in STEM education, contributing to a positive and supportive learning environment. It also explores different conceptualizations of teacher SEMS and provides a first attempt at defining and structuring this broad conceptual space. It concludes with proposing a conceptual teacher SEMS framework.

The second article by [Yang et al.](#), offers a global perspective on STEM education, using CiteSpace to map the ever-evolving knowledge landscape. As we face declining student interest in STEM areas, this analysis provides insights crucial for educators and policymakers, guiding efforts to foster curiosity, innovation, and positive attitudes toward STEM disciplines from a psychological standpoint.

Addressing the anxiety associated with learning and working in STEM areas, the third article by [Cherrier et al.](#), introduces NeuroStratE, an educational neuroscience intervention. By focusing on the psychological dimensions of procrastination and executive planning functions, this research provides a pathway to alleviate the perceived challenges that might deter students from engaging with STEM subjects.

The fourth article by [Johansen et al.](#), navigates the complex terrain of student autonomy, shedding light on both its empowering and potentially hindering aspects. Understanding the psychological motivations and attitudes of students toward autonomy in STEM education is crucial for creating environments that foster intrinsic motivation and positive academic functioning. The authors conclude with highlighting the importance of providing an autonomy supportive environment during higher education lectures.

The fifth article by [Kolil et al.](#), emphasizes the importance of robust measurement tools to understand that a significant barrier to excelling in laboratory practices relates to a lack of self-efficacy. By conducting confirmatory factor analytic validation studies on an experimental self-efficacy scale (ESE) applicable across scientific disciplines, the authors contribute to the development of reliable instruments that aid educators in understanding and addressing students' psychological dispositions in STEM education. They conclude that ESE had a significant impact on the laboratory performance of students of both genders and it was related to factors such as laboratory hazards, conceptual understanding, the sufficiency of laboratory resources and procedural complexities.

As we navigate the relatively uncharted territories of STEM and psychology, it is essential to recognize that the future professions our students will enter, are yet unknown. STEM education, inextricably linked with psychology, neuropsychology, brain science and neurodiversity, not only prepares students for the challenges of tomorrow but also shapes their wellbeing and quality of life experiences. The psychological dimensions explored in this Research Topic are pivotal for fostering a positive mindset toward lifelong learning. As educators, academics, and researchers, our commitment should extend beyond narrowly defined academic outcomes and support ongoing discourse on STEM education and its psychological underpinnings.

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