

Chapter 1

A Review of Mental Health Issues Prevalent in Science, Technology, Engineering, and Mathematics (STEM) Subjects

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ABSTRACT

The stigma surrounding mental health in IT education and industry impacts productivity, health, and career prospects. Little research focuses on mental health factors and efforts in science, technology, engineering, and mathematics (STEM). This chapter collates important factors affecting mental health in STEM, identifies existing efforts, and highlights research gaps. Contributions of this chapter are two-fold: (a) a working taxonomy of the most commonly reported factors affecting mental health in STEM along with the systematic efforts done to improve these factors, and (b) research gaps in systematic efforts which improve the factors identified in the taxonomy, paving the way for future research to fill these gaps. This chapter contributes to a better understanding of mental health in STEM for educational and workplace settings.

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INTRODUCTION

Studying mental health within software design is an emerging topic that has rapidly become a largely discussed issue, especially among Information Technology (IT) users both during their education and once they enter the job market. Unaddressed mental health issues in that sector are reported to have massive implications on users' productivity, long-term health, and career prospects (Rutner et al, 2011), (Mahapatra and Pati, 2018), (Rietze and Zacher, 2022), (Cao and Park, 2017), (Atouba and Lammers, 2018).

Science, Technology, Engineering and Mathematics (STEM) students in particular are reported to have more mental health issues than their counterparts in education (Baron-Cohen et al, 1997), (Windham et al, 2009). Success in STEM involves diligence, skill, and patience, but perfection is often viewed as another expectation of these subjects. STEM subjects' high pressure and rigidity can trigger or exacerbate mental health difficulties, and the silence and stigma surrounding mental health make it even more difficult for students or employees to obtain the support they need and deserve (Galvin et al, 2022). This is complicated further as no two people experience mental health difficulties in the same manner, studying can be difficult, underscoring the need for a flexible yet systematic multi-dimensional approaches to manage these difficulties. These approaches can include (among others): changing studying habits, technological interventions, and/or making the learning experience more health-aware for STEM students.

According to research on student mental health, from a student's perspective, positive mental health is linked to improved cognitive and psychological functioning, including higher academic engagement, creativity, decision-making, problem-solving, concentration, productivity, retention, and outcomes, which also suggests a connection between wellbeing and academic performance (Pascoe et al, 2019). Conversely, poor mental health has a detrimental effect on students' experiences, wellbeing, and achievement (Salimzadeh et al, 2017).

From an employee's perspective, a positive work experience is correlated with optimal health, longevity, and life satisfaction, in addition to improved organization performance. Increasing work and productivity demands brought by organizations and technologization have consistently been associated with increasing work-related stress, burnout, and mental health difficulties (Andersen et al, 2022).

Despite the importance of addressing mental health in the STEM students and IT professionals (i.e. STEM in an educational and workplace setting), little has been done to study the mental health factors and systematic efforts done specifically for the STEM field. As such, the target of this chapter is to collate the most important factors affecting mental health in STEM specifically (both in educational and workplace settings), to identify what systematic efforts have been done to improve these factors, and to identify future research directions to address gaps in these efforts. As such, the contributions of this chapter are two-fold: (a) This chapter presents a working taxonomy of the most commonly reported factors affecting mental health in STEM along with a categorisation of the systematic efforts done to improve these factors both in an educational and workplace setting (b) This chapter identifies research gaps in systematic efforts which improve the factors identified in the taxonomy, paving the way for future research to fill these gaps.

As many of these terms used overlap or can be ambiguous, Section 2 of this chapter clarifies these concepts and terminologies. Section 3 outlines the inclusion and exclusion criteria for the literature, which will help set the scene for the taxonomy. The three explored thematics include Mental Health, Technostress and Assistive Technology, Mental Health - These themes were chosen to explore the factors relevant to our taxonomy. Section 3 prunes this large field to identify literature relevant to mental health in STEM. Technostress - Technostress refers to coping with technology in an unhealthy manner (Brod,

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