FOSTERING DATA LITERACY IN STEM SCHOOL EDUCATION: A SYSTEMATIC REVIEW

Saskia Schreiter[1], Markus Vogel[1], Anja Friedrich[2], Sarah Malone[2], Roland Brünken[2], Sebastian Becker-Genschow[3], Jessica Lehmann[2], Tobias Mosetter[1], Jochen Kuhn[4]

[1]Heidelberg University of Education, [2]Saarland University, Saarbrücken, [3]University of Cologne, [4]Ludwig Maximilian University, Munich

Data and statistical literacy (DSL) are counted among the key competencies of the 21st century and are often set out as an expected outcome of school education (Gal, 2002). Accordingly, curricular adaptions of science, technology, engineering, and mathematics (STEM) education have been made in many countries with the aim of developing competencies that promote competent handling of data, statistics, and their forms of representation. Existing reviews identified promising methods for promoting DSL in higher education (Schüller & Busch, 2019). What has not been explicitly addressed so far is the question of what role school-based STEM education plays in building important foundational skills for DSL.

The main objectives of this systematic review are to compile, systematize, and interpret relevant findings from international research on the role of STEM subjects in fostering DSL. The research questions relate to definitions and conceptualizations of DSL, approaches to promoting it within STEM school education, and characteristics of students and teachers related to the development of student DSL. Following current PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines, a broad systematic search of several literature databases was conducted that resulted in 16.865 records. The following title-abstract screening process was performed independently by two researchers with the support of the machine learning-based active learning software *ASReview*. A set of 598 full-text articles is currently being independently assessed for eligibility by two researchers. In each eligible full-text, findings relevant to the research questions are coded, extracted and synthesized using qualitative content analysis. Initial results indicate that the studies predominantly address the subject of mathematics and focus on student characteristics. Recent studies increasingly focus on the use of data and statistical concepts. Several effective approaches for fostering DSL can be identified.

References

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