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A decade of STEAM education: trends, themes, and global collaborations through a bibliometric lens

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Abstract and Figures

The integration of Science, Technology, Engineering, Arts, and Mathematics (STEAM) has rapidly expanded, aligning with contemporary demands for interdisciplinary and innovative education. This bibliometric study analyzes global STEAM education research published between 2011 and 2025, utilizing data from Scopus and advanced visualization tools, including VOSviewer and Biblioshiny. The analysis identifies significant growth in publications, particularly from 2016 onwards, highlighting a global commitment to integrated curricular approaches and technological innovations. Key publication venues include Education Sciences, Lecture Notes in Computer Science, and ACM

International Conference Proceedings Series. Prominent authors such as Lavicza Z., Jeon M., and Kim J. emerge, supported by robust international collaborations among China, South Korea, and the United States. The keyword and thematic analyses reveal dominant themes of creativity, interdisciplinary learning, robotics, augmented reality, and teacher professional development. A clear temporal evolution of research topics demonstrates a strategic shift from foundational curricula to sophisticated, technology-driven educational models. The study concludes by underscoring the dynamic, evolving nature of STEAM education and offering critical insights into current research trends and future directions. These include the necessity for greater empirical assessment of STEAM pedagogies, the inclusivity of diverse research perspectives, and the consideration of ethical issues in technology-enhanced learning environments.