E-textiles for STEAM education in primary and middle school: a systematic review
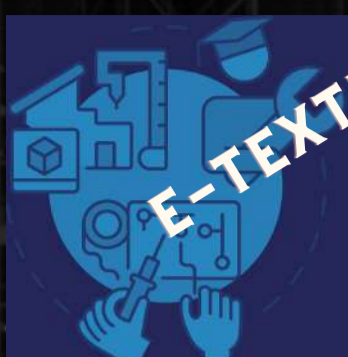
E-TEXTILES

The growing interest in implementing maker education has highlighted the potential of electronic textiles (e-textiles) in the field of education.

STEM

This article employs a systematic review methodology to characterize the scientific literature related to the educational use of e-textiles in primary education, focusing on their role in activities that stimulate diverse knowledge, abilities, and skills within the framework of Science, Technology, Engineering, Art, and Mathematics (STEAM) competencies.

REVIEW

The review covers the period from 2006 to 2021, adhering to the PRISMA standards. Four prestigious international databases (Scopus, ERIC, WoS, and ACM) were consulted, resulting in the identification of 483 articles. After screening, 35 articles that met the predefined eligibility criteria were selected for analysis.

RESULTS

The results and discussions elucidate that the majority of studies were conducted in non-formal educational settings, predominantly utilizing the LilyPad kit as the primary tool. The findings provide data supporting the effectiveness of e-textiles in facilitating learning related to computing, circuits, computational thinking. Numerous studies suggest that the use of e-textiles contributes to equity in STEAM competency acquisition, particularly notable due to the prevalence of female authorship in this field.

CONCLUSION

In conclusion, our study demonstrates that the integration of e-textiles into educational activities for students aged 6 to 13 promotes STEAM skills across all domains. This impact extends to both formal and non-formal contexts, with methodologies designed to encourage student participation and competency-based learning.