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A Systematic Review of Augmented Reality in STEM Education

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ABSTRACT

This study presents a systematic review of the existing literature on the benefits and challenges faced regarding the use of augmented reality (AR) in Science, Technology, Engineering, and Mathematics (STEM) education. Guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) method, a systematic review of the ScienceDirect database identified 19 related studies. Further investigation of these articles resulted in four themes of AR advantages, namely its contribution to learners, the learning outcomes, the interaction of AR, and other benefits. These four themes further produced a total of 16 sub-themes, while the challenges aspect of AR resulted in 5 sub-themes. The most reported benefit of AR is that it stimulates learning achievement. Some observed that the challenges imposed by AR are concerned with marker detection and usability. Several other problems and advantages of AR usage in STEM education were also discovered, which will be discussed in detail. Additionally, the existing gaps of AR study in the STEM education field were identified, and recommendations are therefore presented for future research.

Keywords: STEM, Augmented reality, systematic review, education

Classification JEL: A10, A21, A22, A23, A29

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