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Microlearning in university-level science education: a look at its implementation trends, effectiveness, and critical success factors

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Abstract

Microlearning has become popular recently, not only in corporate environments but also in science education. Microlearning is a method that presents complex information in small, focused units, making it easier for learners to understand the content. Several studies report positive effects of microlearning on science learning outcomes. However, literature review studies on microlearning in the context of science education have not been widely investigated, so comprehensive information is still limited. This study systematically reviews empirical research articles published between 2015 and 2024 using the PRISMA guide and uses thematic analysis. This review focuses on three aspects: (a) trends of microlearning implementation, (b) the effectiveness, and (c) success factors in the implementation of microlearning in science education. Results show an increasing adoption of microlearning across various countries with evidence of improved learning outcomes and understanding of science concepts. This study identified three main success factors that support the implementation of microlearning in science learning: the use of technology for content delivery, the type of microlearning content, and instructional design. These findings offer practical recommendations for educators implementing microlearning in science teaching.