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**Title**

An exploration of longitudinal studies of digital learning / Vilhelmiina Harju, Antti Koskinen and Leila Pehkonen

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**Abstract**

Background: The importance of digital technologies for enhancing learning in formal education settings has been widely acknowledged. In the light of this expectation, it is important to investigate the effects of these technologies on students' learning and development. Purpose: This study explores longitudinal empirical research on digital learning in the context of primary and secondary education. By focusing on a small selection of the peer-reviewed literature, the aim is to examine the kinds of longitudinal study published on this topic during the period 2012–2017 and, through categorisation, to bring together insights about the reported influences of digital technology use on students' learning. Design and methods: The databases searched for the purposes of this review were Scopus and Web of Science. Of 1,989 articles, 13 were finally included in the review. Using qualitative content analysis, these were analysed, coded and categorised. Results: The reviewed studies were found to have approached digital learning in different ways: they varied, for example, in

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terms of research methods and design and the digital technologies used. The studies addressed different aspects of learning, which we assigned to six categories: affection, attitude, and motivation; subject-specific knowledge and skills; transversal skills; learning experience; elements of the learning environment; and identity. We identified both positive and negative influences of technology on learning. Conclusions: This review offers a snapshot of the variety of research in this fast-moving area. The studies we explored were found to approach digital learning from several different perspectives, and no straightforward conclusions can be drawn about the influences of digital technology use on students' learning. We conclude that further longitudinal studies of digital learning are needed, and this study assists by highlighting gaps in the existing literature. (HRK / Abstract übernommen)