Integrating digital technology in mathematics education: A Swedish case study

# Details

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## Authors

Viberg O.;Grönlund Å.;Andersson A.

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## Sample

68 students aged 17 to 18 and three teachers participating in mathematical education at three Swedish schools.

## Implications For Educators About

STEM Education

# Abstract

Integrating digital technology in education is challenging. This study reports on three high school mathematics classes where teachers attempted to improve their teaching and student learning by using a digital tool. For analysis we use the Information System Artifact model Lee et al. (2015) which distinguishes between three integrated sub-artifacts, the technological, the informational and the social and the Structurational Practice Lens to educational technology Halperin (2017). Using interviews and observations we find the major obstacle for student learning is a less developed social artifact. Students have difficulties using the tool effectively when teachers do not work to develop shared practices in technology use. When teachers do not themselves use the tool actively, they do not fully understand how students can learn from it, neither can they help them in synthesizing teacher- and tool instructions. Students end up having "two masters" competing rather than integrated teacher instruction and technology assistance.

# Outcome

"This study set out to investigate how digital tools were integrated in mathematics education, and we found that they are basically not. Students were most often left on their own to figure out how MathAid works and what use they might have of it. Consequently, many students had a hard time learning how to use it, even more so understanding how to become more effective in their learning." Teachers tended to overestimate the students’ digital literacy skills. "Understanding how to use a mathematics app is not just about digital skills, it is also about domain knowledge.... curriculum-technology integration appears as a key challenge."