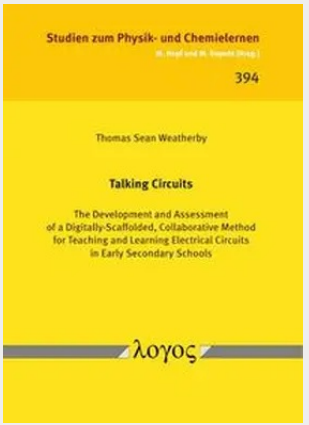
Weatherby

Talking Circuits

The Development and Assessment of a Digitally-Scaffolded, Collaborative Method for Teaching and Learning Electrical Circuits in Early Secondary Schools



Learning about electric circuits demands abstract thinking, new vocabulary and using concepts that contrast with learners' prior knowledge. Drawing on helpful ideas from everyday experiences with pressure, such as bike tyres and balloons, and evidence from cognitive science, I present an accessible approach using the electron gas model for the first time in English. Building on the design principles of digital tools and collaborative learning, I designed a tablet-based system to scaffold small-group talk to foster conceptual change: ``Talking Circuits''. This prompting tool enabled real-time assessment of student-student talk, so that lengthy and expensive collaborative learning interventions could be more easily implemented. In a comparative study of 228 learners, aged 12 to 14, I compared two conditions taught using the electron gas model: one using standard classroom materials and the second adding the ``Talking Circuits'' application. Concept knowledge and motivation were measured in pre- and post-tests. Results show no significant changes in learning outcomes. The only statistically significant, albeit small, changes were reductions in perceived competence. This tentatively points to the need for longer implementation timeframes and teacher professional development. Learning electricity is demanding; conceptual change likely needs more time than typical British timetables allow.

57,00 €
53,27 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783832560089
Medium: Buch
ISBN: 978-3-8325-6008-9
Verlag: Logos
Erscheinungstermin: 10.11.2025
Sprache(n): Englisch
Auflage: Erscheinungsjahr 2025
Serie: Studien zum Physik- und Chemielernen
Produktform: Kartoniert
Seiten: 327
Format (B x H): 145 x 210 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)