GIREP-EPEC
Transforming physics learning via Research & Practice
LEIDEN, 2025

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It's all about the BASICs: a framework for a hands-on electronic course

Wednesday 2 July 2025 09:20 (20 minutes)

Our bachelor's Nanobiology electronic instrumentation course has had limited success in fostering student's conceptual development during, in their perception, tedious lab work. To improve students'learning outcomes and their time-management abilities, we developed the Background, Anticipate, Simulate, Implement & Investigate, Compare & Conclude (BASIC) framework to reduce cognitive load: by adapting the Predict-Observe-Explain structure with Just-In-Time-Teaching, a clear scaffolding structure, and improved expectation management. After a one-week pilot study, we ran the BASIC framework for two years. We observe that students come to class better prepared, manage to finish assignments in time, understand better, and are overall more satisfied.

Education level

Age over 18 (excluding teacher education)

Physics topic

Interdisciplinary topics

Research focus

Innovative instructional strategies and pathways

Research method

Educational design research (Qualitative research)

Organizing preference criteria

Education level

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Session Classification: Parallel oral presentations

Track Classification: Instructional strategies & Curricula (INSTR)