

TEACHERS' KNOWLEDGE OF STUDENTS' CONSTRUCTS ABOUT MICROSCOPIC PROCESSES

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ABSTRACT

The study investigated development of 30 senior-secondary school physics teachers' knowledge of content and students' conceptions using agent-based modelling (Netlogo). The data collection procedures involved interviews and a workshop. The findings illustrated that teachers lacked an in-depth conceptual understanding of the microscopic behaviour of particles and failed to provide adequate opportunities to students to visualise microscopic phenomena. Through an engagement with hands-on explorations, teachers explored how interactions between individual agents resulted in complex dynamic phenomena. The workshop resulted in a substantial growth in not only teachers' subject-matter knowledge but also knowledge of learners' difficulties and addressing them through agent-modelling approach.

KEYWORDS: *Physics, teachers, alternative conceptions, agent-based modelling, kinetic theory of gases*

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