



Contribution ID: 131

Type: Oral Presentation

Gaps in Teacher Competencies Linked to Inquiry-Based Practical Work in Certain Resource-Constrained South African Physical Sciences Classrooms

Monday, 1 October 2018 17:40 (20 minutes)

Scientific research and economic development are being threatened by the dwindling interest of learners in science. The incorporation of inquiry in science education can contribute to addressing this threat while fostering scientific literacy. However, in relation to the implementation of inquiry-based science education, serious gaps in the competencies of science teachers have been noted. In order to better address these gaps, professional development efforts need to be context-specific and linked to the specific needs of the participating teachers. In order to inform such professional development, we focussed in this research on the case of teachers in certain resource-constrained South African physical sciences (physics and chemistry) classrooms. The purpose was to identify gaps in teacher competencies associated with the routine implementation of inquiry-based practical work. Based on a framework of teacher competencies including the TPACK framework, we used a multi-method case study involving two resource-constrained High Schools. The data collection methods consisted of interviews, classroom observation, artefacts (document analysis), and field notes. We analysed the resulting data using the data-driven inductive approach in thematic analysis. The results show that in relation to the implementation of inquiry-based practical work in the classroom, participants have multiple gaps in their content knowledge, pedagogical knowledge, technological knowledge, pedagogical content knowledge, technological pedagogical knowledge, in addition to certain professional values. We have discussed the research- and practice-based implications of these results in relation to teacher professional development in South Africa and internationally.

Apply to be considered for a student award (Yes / No)?

NO

Level for award (Hons, MSc, PhD, N/A)?

N/A

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Session Classification: Parallel Session 1

Track Classification: Track H - Teacher Education and Training in Physics