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Transforming Physical Sciences Teaching through Targeted Professional Development

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Physical Sciences teachers in under-resourced South African schools often face systemic challenges, including limited access to continuous professional development, inadequate teaching resources, and insufficient support for both content and pedagogy. These challenges frequently result in teacher-centred practices that hinder learners' development of conceptual understanding and procedural knowledge. This paper presents findings from a professional development initiative led by the Department of Physics and Astronomy at the University of the Western Cape, aimed at addressing these issues in surrounding schools. The programme included interactive workshops, collaborative lesson planning, and classroom-based support, with a particular focus on promoting learner-centred approaches such as Modeling Instruction. Data were collected through teacher surveys, pre- and post-tests, and reflective activities to assess changes in content knowledge and pedagogical practice. The findings reveal increased teacher confidence and notable improvements in both content knowledge and the adoption of learner-centred teaching strategies. This study contributes to the ongoing discourse on designing contextually relevant and sustainable professional development models for science educators in resource-constrained environments.

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