

EFFECTIVE PROFESSIONAL DEVELOPMENT STRATEGIES FOR SCIENCE TEACHERS IN SECONDARY EDUCATION IN SRI LANKA

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This study explored the effective professional development strategies for science teachers in secondary education in Sri Lanka. The study aimed at improving instructional practices and enhancing student engagement. A mixed-methods approach was adopted and investigated the effective instructional practices, and their impact on student engagement and learning outcomes. Data was collected from 27 science teachers and 58 students across 12 schools in Matale, Kandy, and Nuwara Eliya Districts. Teachers were selected by purposive sampling, and students were selected by random sampling. Surveys and questionnaires were designed to assess teachers' experiences with professional development and its impact on their teaching practices. In-depth interviews with teachers and students were facilitated using interview guides. Classroom observations were conducted employing observation protocols with rubrics or checklists. Qualitative data were analysed using thematic analysis, while quantitative data were analysed using SPSS statistical software. Ethical considerations were meticulously followed, including obtaining informed consent from participants, ensuring confidentiality and anonymity, and adhering to ethical guidelines for educational research. The findings of this study indicated that targeted professional development strategies significantly enhanced the instructional practices of science teachers in secondary education, leading to more interactive and engaging classrooms. Specifically, 81% of the teachers reported improved lesson planning and the integration of active learning techniques, such as inquiry-based learning and collaborative activities. Additionally, the incorporation of technology in teaching practices, such as digital simulations and interactive science platforms, resulted in a 15% increase in student engagement and a notable improvement in critical thinking skills. Teachers who underwent professional development centred on pedagogical innovation and technology integration demonstrated higher levels of confidence in delivering content, which in turn positively impacted student performance. These results underscore the importance of aligning professional development programs with both technological advancements and the specific pedagogical needs of science education in Sri Lanka.

Keywords: Instructional practices, Professional development, Science education, Student engagement