Chapter 10
Exploring Transdisciplinary Approaches to Teaching Physical Sciences in Gauteng, South Africa:
The Pedagogy of Using Smartboard Technologies

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ABSTRACT

Against the background of transdisciplinary approaches to learning outcomes in higher education, the purpose of this chapter is exploring transdisciplinary approaches to teaching Physical Sciences (PS) in selected schools of Gauteng province, South Africa with regard to a pedagogy of using smartboard technologies. The main focus of this chapter will e.g., be on bridging the gap of digital transformation in higher education and establishing the reliability and validity of research instruments using partial least squares structural equation modelling (PLS-SEM).

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INTRODUCTION

This section describes the general perspective of the chapter and end by specifically stating the **objectives**.

Transdisciplinary Approaches to Learning Outcomes in Higher Education

In this modern era of research, the importance of cross- and **transdisciplinary** approaches **to** action research and action learning for e-schools, community engagement and Information and Communication Technologies for Development (ICT4D) cannot be ruled out (Mapotse, 2017). Three cyclic activities namely research, participation and action are involved in seeking the answers to the practical questions incorporating the features of collaborative, participatory and situational research. This cyclical process includes the identification of the problem, a plan of action, as well as collection of observations and behavioral data. This is also involved in data analysis and carrying out data-driven actions. Mixed-research methods are used within the stages of cyclic practices as an attempt to legitimate the use of multiple approaches to answer the research questions using its domain, as well as transdisciplinary approaches. Sometimes it is better to remove the restriction or constraint for researchers' choices to collect and analyze the research data. This is because mixed research is complementary, expansive, inclusive and pluralistic, and does not create boundaries in the research. Directly or indirectly, all research is targeted at better serving humanity by exploring, explaining, and describing new things and adopting them in practice. With the implementation of the best strategies and evaluation, higher education learning outcomes can be enhanced for better learning. This should be the point of interest for all stakeholders in an education system. Researchers from academia need to explore new things, especially from different disciplines, so that they can provide something new to their students. For better coverage of multiple dimensions, multidisciplinary and transdisciplinary research are to be practiced.

Exploring the Pedagogy of Teaching Physical Sciences Using Smartboard Technologies in Selected Gauteng Schools, South Africa

Towards fostering pedagogical innovation through effective smart board instruction, the "purpose of the study reported on in" the previous chapter by Tefo and Goosen (2024, p. 287) was "exploring the pedagogy concerning the teaching, learning, and assessment of grade 12 Physical Sciences using smartboard technologies in schools selected from one of the districts in the city of Tshwane, Gauteng

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