

Pre-service teachers'
mathematics profiles
and the influence thereof on their
instructional behaviour

by

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ABSTRACT

This study examined the influence of the mathematics profiles of secondary school pre-service mathematics teachers on their instructional behaviour. The mathematics profile construct was determined with respect to four components, namely, subject matter knowledge, pedagogical content knowledge, conceptions of mathematics and beliefs about the teaching and learning of mathematics. The instructional behaviour construct was studied with regard to participants' use of a traditional versus reform approach to teaching, and whether learners were afforded an authoritarian versus democratic style of learning. Social constructivism formed the epistemological underpinning. The context for the study was a Post Graduate Certificate in Education (PGCE) course at a university in South Africa. The study adopted a qualitative post-hoc research approach of seven case studies. The final portfolios submitted by participants as part of their PGCE course were used as the main source of data. Through participant and researcher reflections, a visual representation of each participant's mathematics profile and instructional behaviour was constructed. These were then compared in within-case and cross-case comparisons. Findings indicated that the mathematics profiles of pre-service mathematics teachers have an influence on either enabling or constraining the development of their instructional behaviour. An improvement in the pedagogical content knowledge of mathematics teachers without positive changes in their conceptions and beliefs and the quality of their reflections and subject matter knowledge does not result in reformed instructional behaviour. The mathematics profile as a package needs to be developed in order for pre-service mathematics teachers to make the required changes in their instructional behaviour towards a more reform-orientated approach to teaching and learning of mathematics.

Keywords: pre-service, mathematics, teaching, learning, secondary, instructional behaviour, profiles, social constructivism



To God be all the glory

Isaiah 58 vs 8

Then shall your light break forth like the morning, and your healing (your restoration and the power of a new life) shall spring forth speedily; your righteousness (your rightness, your justice, and your right relationship with God) shall go before you [conducting you to peace and prosperity], and the glory of the Lord shall be your rear guard.

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LIST OF ACRONYMS

PGCE	Post Graduate Certificate in Education
OBE	Outcomes-based education
DoE	Department of Education
FET	Further Education and Training
TIMSS	Third/(Trends in) International Mathematics and Science Study
NGO	Non-governmental organisation
NCS	National Curriculum Statement
C2005	Curriculum 2005
IPET	Initial Professional Education and Training
CPTD	Continuing Professional Training and Development
NQF	National Qualifications Framework
SAQA	South African Qualifications Authority
CHE	Council for Higher Education
HEQC	Higher Education Quality Committee
LTD	Learning Task Design
PCK	Pedagogical content knowledge
SBE	School-based education
BSc	Bachelor of Science
BSecEd	Bachelor of Secondary Education
BEd	Bachelor of Education
BA	Bachelor of Arts

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