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

by

Hannah Elizabeth Barnes

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Professor Sarah Howie
Professor Venitha Pillay

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