

https://dspace.org/

Secondary school mathematics teachers' pedagogic reasoning and action in relation to learner errors and misconceptions in quadratic inequalities

Marange, Edgar

2021
https://hdl.handle.net/10539/32879

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

Learner achievement in school mathematics has been of great concern not only to South Africa but to the whole world at large. Many and varied reasons have been postulated as the underlying factors for the unconvincing learner achievement. Of particular importance is the mathematical pedagogical content knowledge or mathematical knowledge for teaching, a monopoly of knowledge by the mathematics teachers. However, on the flip side there is the subject of errors and misconceptions learners make in their endeavour to actively construct knowledge on the social plane. It is for this reason that this study sought to explore secondary school Mathematics teachers' Pedagogic Reasoning and Action (PRA) in relation to learner errors and misconceptions in quadratic inequalities. The study was framed within Vygotsky's socio-cultural theory of learning for which teachers are regarded as key in mediating learning in their learners' Zones of Proximal Development (ZPD). Located in the interpretivist paradigm and adopting a qualitative approach, which foregrounds multiple and subjective forms of reality, the study utilised an exploratory case study as the design genre or strategy of inquiry. In this regard, the research design was a case study of three secondary school mathematics teachers. Data were generated using interviews, observations and learners' written work. The analysis of data followed a qualitative content analysis strategy to unpack and lay bare the teachers' PRA in relation to the problem of learner errors and misconceptions in quadratic inequalities. Among the findings of the study was the ability of secondary school Mathematics teachers to identify the procedural errors, linear extrapolation and conceptual errors which learners make in quadratic inequalities. The secondary school Mathematics were also able to interpret the underlying factors for such errors. The study thus concluded that the ability of secondary school Mathematics teachers to evaluate learner performance with regard to the errors they make in quadratic inequalities should be the starting point for devising instructional strategies to address such errors. Therefore, the key recommendation is that the teachers' PRA should be focussed on eliciting powerful forms of instructional strategies, which are adaptive and tailored to the variations in learner ability and backgrounds