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The ways in which three grade 10 mathematics teachers use formative assessment to select and mediate learner teacher support material

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Abstract

The study investigated the ways in which Three Grade 10 teachers in KwaZulu Natal South Africa use LTSM to help mediate learners' knowledge gaps in mathematics. The specific focus of the investigation is on trigonometry, as a subdomain of mathematics, with which learners experience difficulties in understanding. The study used LTSM from a research project that involved a pre- and post - diagnostic test and Learner Teacher Support Materials (LTSM) as a resource and intervention method designed to mediate knowledge gaps. The conceptual framework used Elmore's (2008) instructional core as a basis for analysis. Thus, over and above the analysis of the diagnostic tests and LTSM, a significant component of the study analysed teacher instructional practices in the classroom in using the LTSM to mediate learners' knowledge gaps.

The research strategy is qualitative, making use of descriptive statistics, using case study methodology to observe three teachers. The findings showed that teachers do not use diagnostic assessment as a tool to assess learning gaps, and their mediation was not informed by the diagnostic assessment. The pre-diagnostic tests showed significant knowledge gaps, and the post-test showed significant improvement in certain types of knowledge for two teachers, where only one teacher showed significant improvement in two of three constructs considered fundamental to trigonometry.

The ways in which the three teachers used the LTSM to address learners knowledge gaps can be explained in their instructional practices, involving their pedagogical moves, and scaffolding processes in the classroom. The three teachers used the LTSM differently, and used it only in one of two lessons observed and they made choices when, how and for what purposes they used the LTSM.

The study recommends further research including a longer term comparative study. These ideas are to be integrated into policy frameworks. It also recommends research into practices that encourage learner involvement in the mediating of knowledge gaps, the type of teacher training and support required to bridge these gaps, as well as the tools, LTSM and other resources required to close them. I argue for these resources to be used to provide teachers with diagnostic assessment tools and resources in key topics of the curriculum, which learners generally find difficult and for which they possess a lack of pre-requisite i.e. foundational knowledge. Given teachers knowledge of the way in which learners learn was limited, I therefore argue that teacher professional development ought not to only focus on the content of educative materials for addressing learning gaps, but that it requires a focus on

teachers' theoretical understanding of the way in which learners learn, and the interactive relationship between their pedagogical moves and scaffolded processes in the classroom. The outcome of this argument underscores the fact that teachers require teacher training so as to integrate the theories of psychology of learning with classroom pedagogy, such that they are enabled to use their teaching practices to assist learners to overcome knowledge gaps and develop higher cognitive abilities