ABSTRACT

This study explored the significance of teacher professional noticing of learners' mathematical thinking in teaching and learning of the most confusing operations on directed numbers in Grade 8. The focus of this study was on the use of Wallach et al.'s (2005) forms of learner hearing together with Jacob et al.'s (2010) three interrelated skills on teacher professional noticing. The three aspects of teacher professional noticing are attending learners' techniques, interpreting learning understanding, and determining how to respond on the basis of learners' understanding. According to Wallach et al. (2005), five forms of learner hearing are non-hearing, biased-hearing, compatible-hearing, over-hearing, and under-hearing.

Does the application of teacher professional noticing have an impact on teaching and learning performance? To answer this question the study specifically addressed three critical questions namely, 1. What skills of noticing does the teacher embark on when using teacher professional noticing theory to teach and identify errors/misconceptions experienced in the classroom? 2. How does teaching based on professional noticing of errors/misconceptions assist teachers in teaching and learning new knowledge? 3. What form of learner hearing is the best associate when practicing professional noticing?

The data was collected from two experimental classes and two control classes in two different schools located in the inner-city of Johannesburg. The data was collected in the form of Pre-test marked scripts, Post-tests marked scripts, and transcribed audio-recordings. The data was then analysed on the basis of the concepts emerging from the conceptual framework.

The findings revealed that both Jacob et al.'s (2010) interrelated skills on professional noticing and Wallach et al.'s (2005) form of learner hearing namely compatible-hearing had the potential to improve and address the problem of teaching and learning operation on directed numbers. As a result, the three interrelated skills of professional noticing make it easier for teachers to recognize the learners' Zone of Proximal Development (ZPD). Professional noticing is like a teacher seeking to find out about a learner's ZPD. And if the teacher listens to the learner, hears the learner, and understands what the learner does, it allows the teacher to find the learners' ZPD and that s/he can help the learners. The value of using powerful knowledge in conjunction with teacher professional noticing among learners

in the experimental classes can, therefore, be realized in this situation through a pedagogy that is sensitive to their life-worlds.