AN APPLICATION OF DYNAMIC ASSESSMENT TO SCHOOL MATHEMATICAL LEARNING

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Certificate

I certify that the substance of this thesis has not already been submitted for any degree and is not being currently submitted for any other degree.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.



Jeanette Berman

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ABSTRACT

This study is in response to the documented need to develop alternative assessment procedures which reflect current conceptions of the nature of school mathematical learning. From the literature a conceptual framework was developed that reflected key aspects of assessment of school mathematics. The nature of school mathematical learning was defined and the types of educational decisions arising from assessment were identified. The nature of conventional and alternative assessment paradigms was also defined.

The initial theme of the study was to examine the support provided by conventional and alternative assessment for classroom educational decisions. The second theme of the study was to consider the theoretical bases for assessment, in particular Vygotskian theory, which explicitly integrates assessment with teaching and learning. The third focus of the study related to the operationalisation of Vygotskian theory as dynamic assessment. It sought to define conditions for the practical use of dynamic assessment related to a specific domain of school mathematics, understanding of place-value numeration. These research themes were explored through the development and implementation of a dynamic assessment procedure for use by school psychologists within a particular school and curriculum context.

The support for classroom educational decisions from the dynamic assessment procedure was compared to that provided by conventional assessment. Outcomes show that differences in content validity account for discrepancies in information about student learning derived from the conventional and dynamic assessments. The dynamic assessment procedure was able to maintain content validity through reference to cognitive definitions of learning and the use of a set of cognitive research tasks. In contrast, the conventional assessment instruments had lower content validity due to the restricted nature of the item format.

The study also demonstrates the contribution of Vygotskian theory to the development of clinical assessment procedures for school contexts. Vygotskian theory informed the development of the dynamic assessment procedure and underpins the integration of teaching, learning and assessment evident in the study. In response to documented resistance to dynamic assessment in schools, conditions under which dynamic assessment can be implemented in schools are identified. The attitude of the assessor to the inclusion of teaching in an assessment procedure, the importance of the assessor-student relationship and the assessor's knowledge of the curriculum domain of learning are all defined as essential aspects of dynamic assessment. Professional development to introduce practising school psychologists to dynamic assessment is recommended by the study.

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