

Pre-service Mathematics Teachers' Mental Constructions of the Determinant Concept

Zanele Ndlovu¹ and Deonarain Brijlall²

¹School of Education, University of KwaZulu-Natal, South Africa

²Department of Mathematics, Durban University of Technology, South Africa

E-mail: ¹<Ndlovuz3@ukzn.ac.za>, ²<deonarainb@dut.ac.za>

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ABSTRACT This study aims to reveal the nature of mental constructions made by pre-service teachers when learning the determinant concepts and to contribute to APOS theory (Action, Process, Object and Schema) in terms of instructional strategies. This is guided by the belief that understanding the mental constructions the students make when learning mathematical concepts leads to improved instructional methods. The data was collected through a structured activity sheet and interviews. The findings revealed that the mental constructions made by pre-service teachers in most cases do concur with the preliminary genetic decompositions, and that many pre-service teachers are operating at an action/process stages, with the exception of the few operating at an object stage. It also revealed that many students could carry procedures effectively, even if the meaning of the concept is not constructed, which indicates that students mainly possess procedural knowledge of the determinant concept.