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ON THE LEARNING PRACTICES OF FIRST YEAR CHEMICAL AND METALLURGICAL ENGINEERING STUDENTS AT WITS: A PHENOMENOGRAPHIC STUDY

Laurie Woollacott

ABSTRACT

The study presented in this thesis was motivated by the poor academic performance of many entrants to the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand, Johannesburg, South Africa. The premise behind the study is that the learning practices of students – the way they typically go about studying and learning – has a significant bearing on the quality of their learning and consequently on their academic prospects at university. Accordingly, the objective of the study was to develop an evidence-based understanding of the learning practices of our students. The kind of understanding sought was one which could inform interventions and/or curriculum re-design that aim to improve the quality of our students' learning by facilitating an improvement in the quality of their learning practices and, thereby, to reduce attrition. To the extent that our students are representative of entrants to engineering education in the country, the findings of the study could have relevance beyond the context of our school.

The methodology employed to achieve the study's objective was phenomenography. Based on interviews with 31 students from the 2008 entering cohort, qualitatively different types of learning practice were found in 6 different contexts of studying and learning. The variation in the learning practices in four of these contexts was investigated in detail. The practice that was found to exert the most direct influence on the quality of a student's learning was their 'mastering-practice' – i.e. how a student typically relates to and engages with studying and learning when they focus exclusively on the mastering of the requisite knowledge, understanding and skills. Six levels of sophistication in mastering-practice were identified.

Three other types of learning practice were also investigated in depth: learning management practice; class-room practice (how students engage with verbal input of course material); and test-focused study practice (how they typically prepare for tests and exams). The study identified five categories of variation in learning management practice, five categories of variation in classroom practice, and four categories of variation in test-focused study practice. It also found that these practices could influence the quality of a student's learning by the way in which they constrained their mastering-

practice or diverted attention away from the exercise of their mastering-practice. The inter-relations between the different types of practice are discussed.

The findings from the phenomenographic studies were augmented by investigations into the dynamics associated with how the students learning practices changed during their first year at university. In addition, the study developed a number of pedagogical tools or procedures for interpreting findings of the kind developed in the study and for using them to guide the design of pedagogical measures for improving students' learning by helping those students to modify their learning practices.

Apart from some theoretical developments that emerged and the specific findings about the nature of the learning practices of our students, the study's contribution to knowledge consists of a methodology for identifying the qualitative essentials of the developmental pathways which students need to negotiate if they are to develop their learning practice to a more sophisticated level.