

ABSTRACT

Group Theory is one of the mandatory courses taught usually in the second year of a Bachelor degree in Mathematics and is typically considered by students as one of the most challenging ones, mainly because of its abstract and rigorous nature. Often, after their first encounter students tend to avoid third-year or further courses in this area of Mathematics.

This study is a close examination of the conceptual and learning aspects of Year 2 Mathematics undergraduates' learning experience in Group Theory. The course was mandatory. The data consists of: observation notes and audio-recordings of lectures and seminars; lecture notes; student and staff interviews; and, marked coursework and examination scripts. For the interpretation of data I have used the Commognitive Theoretical Framework (Sfard, 2008), focusing on three general issues including: *the object-level and metalevel learning* and the conceptual difficulties that may occur; *the teaching and learning*, within the context of lecture, seminar and tutorial, as a form of communication; and the students' applied *study skills*.

Data analysis suggests that object-level and metalevel understanding are intertwined when learning a new mathematical discourse, and the discursive shift involved in object-level and metalevel learning is a complex procedure, especially within the abstract context of Group Theory. Two important milestones in the learning of Group Theory is the introduction of equivalence relations and normality. Regarding transition, this study suggests that it cannot be limited with respect to secondary-tertiary level Mathematics, but it rather involves a more complex shift, among different theories, and fields of undergraduate Mathematics. Such discursive shift requires adjustments in the students' study skills. Students have applied several techniques for the preparation of coursework and examination revision, with one, the *spiral revision model* being particularly prevalent. In addition, students have shown remarkable sensitivity on the effectiveness of communication in different contexts, e.g. mathematical conversations, or presentation of their reasoning.