

# **An Exploratory Study of Formal Reasoning Abilities of Grade 10 Students and Mathematics Achievement**

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## **Abstract**

This research work aimed to investigate the reasoning abilities of Grade 10 students in five forms of formal logical thought (control of variables, proportional, probabilistic, correlational, and combinatorial reasoning), to identify differences between male and female students related to their reasoning abilities and to determine whether students' reasoning abilities contribute to the prediction of their achievement in Mathematics. The sample of the present study was composed of 202 males and 215 females Grade 10 students from eight different schools in Yangon City Development Area in 2011-2012 Academic Year. For the data collection, two instruments, the Formal Reasoning Abilities (FRA) Test ( $\alpha = 0.852$ ) and Mathematics Achievement (MA) Test were used. Data obtained were analyzed by using Statistical Package for Social Science SPSS. According to the research results, the positive correlation between FRA score and MA score was significant at 0.01 level. Thus, students' reasoning abilities can contribute to the prediction of their achievement in Mathematics. Researcher would like to suggest the future researchers should conduct research with more students with various ages. It is suggested that students' formal reasoning abilities should be promoted with training and practicing so that they might perform well in Mathematics as well as in other science subjects.

**Key word:** Formal Reasoning Abilities

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