

**CONCEPTUAL UNDERSTANDING OF GENETICS AMONG GRADE 10 STUDENTS:
A CASE STUDY IN THE KANDY EDUCATION ZONE**

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Understanding Genetics at GCE (O/L) is considered difficult by the students, while most teachers believe that teaching Genetics is not easy. The objective of the current study was to investigate the conceptual understanding of Genetics among students in grade 10 (Sinhala medium) government schools in the Kandy Education Zone. The research used mixed methods, and data were gathered quantitatively through a two-tier diagnostic test and qualitatively using semi-structured and informal interviews. The sample consisted of 173 students representing both genders from six schools in the Kandy Education Zone, representing school types viz., 1 AB (Schools with Advanced Level Science stream classes), 1C (Schools with Advanced Level Arts and Commerce streams but no Science stream) and Type 2 (Schools with classes only up to grade 11). The quantitative data were analysed using Minitab statistical software. The study revealed that the extent of conceptual understanding of Genetics could be diagnosed through the two-tier diagnostic test. At the same time, the number of students who correctly answered the content choice ranged from 28.3 to 94.2% and those who answered both the content and the reason correctly ranged from 11.0 to 65.3%. This indicates that the students select content responses without a proper understanding, indicating that the tenth-grade students have several misconceptions about genetics. Thirty-two major misconceptions were identified by analysing items on the grade 10 Genetics diagnostic test. There was no statistical difference in students' performance between gender or school type. In conclusion, the study revealed that the conceptual understanding of Genetics among grade 10 students was not satisfactory, and the students had several misconceptions about Genetics.

Keywords: Biology Education, Genetics, Misconceptions, Two-tier diagnostic test