

**MISCONCEPTIONS IN MENDELIAN GENETICS AMONG G.C.E. (A/L)
BIOLOGICAL SCIENCE STUDENTS IN THE BATTICALOA EDUCATION ZONE,
SRI LANKA: SIMULATION AS AN EFFECTIVE TEACHING AID**

S. Parthipachuthan^{1*} and S. Rajapakse²

¹*Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka*

²*Department of Molecular Biology and Biotechnology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka*

**suhanya1982@gmail.com*

Genetics is one of the difficult course modules for students in the G.C.E. (A/L) Biology curriculum. This study was designed to identify the misconceptions of G.C.E. (A/L) Biological Science students on basic concepts in Genetics and determine the effectiveness of simulations in teaching the unit Genetics. The study was carried out in Batticaloa Education Zone, Sri Lanka. A mixed-method approach was selected for this study. The data were collected from semi-structured interviews, pre-and post-tests. A two-tier multiple-choice instrument was used to diagnose misconceptions of students in Basic Genetics. The reliability of the instrument was determined with the use of Cronbach's alpha coefficient ($\alpha = 0.71$). The samples consisted of 84 Grade 13 students from three selected schools and five biology teachers. Simulations of Mendel's genetics were used as a teaching aid for experimental groups, and the traditional method was used for control groups. The data were analysed using frequency counts, percentages, means and standard deviations in SPSS. Qualitative data were analysed using Grounded Theory. The results revealed that students possessed misconceptions on ten selected basic concepts in Genetics. Three concepts showed above 25% of misconceptions (gene: 46.4%, chromosomes: 31% and Punnett square: 29.8%) in the pre-test. The mean score of knowledge on Basic Genetics in students was 24.7 ± 13.1 in the pre-test. In the post-test, the mean score of the experimental group (67.0%; $SD = 14.9$) was significantly higher than the control group (51.4%; $SD = 15.4$). In addition, the number of misconceptions was significantly lessened in students in the experimental group than in the control group. Misconceptions in the two selected concepts decreased effectively in the experimental group. The study revealed that simulations could effectively eliminate students' misconceptions in the unit Genetics for G.C.E. (A/L) Biological Science students.

Keywords: Mendelian genetics, Misconceptions, Simulations