

STUDENTS' COMPETENCY IN EXPLAINING SCIENTIFIC PHENOMENA AND ACADEMIC PERFORMANCE: A CASE STUDY OF ADVANCED LEVEL SCIENCE STUDENTS IN KANDY EDUCATIONAL ZONE, SRI LANKA

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Science education aims to use scientific knowledge to explain phenomena by understanding their causes, circumstances, and implications. Despite the importance of this competency in the 21st century, it is uncertain if students in Sri Lanka's G.C.E. A/L science stream possess the proficiency demanded by the global community. This study examined the relationship between competency in explaining scientific phenomena and the academic performance of students in the Advanced Level Science stream based on their gender. The study employed descriptive one-shot cross-sectional survey analysis under a quantitative research approach. The study sample consisted of 121 Grade 13 students enrolled in Advanced Level Science classes in six schools in Kandy Zone, selected by a non-randomized convenience sampling method. Data were collected using a self-constructed test of competency in explaining scientific phenomena, with a reliability coefficient of 0.584. First and second term test marks were utilised by students to assess their academic performance. Data were analysed using MS Excel and SPSS software, using descriptive and parametric statistical methods. The mean, range, and standard deviation of scores in students' competency in explaining scientific phenomena and academic performance were analysed; correlation and regression analysis were used to assess relationships between the variables. The mean scores of competencies in explaining scientific phenomena were 29.26 and 41.44, with standard deviations of 16.02 and 19.61, while mean scores of academic performance were 46.9 and 56.02, with standard deviations of 11.17 and 17.16 in male and female students, respectively. Female students demonstrated higher levels of competency than male students, with 13.6% of female and 3.2% of male students falling into the good and very good performance categories. A positive correlation between competency in explaining scientific phenomena and academic performance was observed ($r = 0.620$, $n = 121$, $p = 0.001$). Furthermore, the unstandardized coefficient of the competency scores in explaining scientific phenomena indicated that for each competency score raised, male and female students' academic performance scores increased by 0.223 ($p = 0.011$) and 0.638 ($p = 0.000$), respectively. The findings suggest that teachers should implement instructional strategies that can improve students' competency in explaining scientific phenomena, as this affects their academic performance.

Keywords: Advanced level, Academic performance, Scientific phenomena, Science stream