

Improving Students Academic Performance in Biology: A Comparative Effectiveness of Problem-Based, Argumentation-Based and Visualised-Case Based Learning Instructional Strategies

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Abstract

The study examined the academic performance of students using 3-inquiry instructional strategies. This was with a view to determining the effectiveness of Problem-based Learning (PBL), Argumentation-based Learning (ABL), and Visualised-Case-based Learning (VCBL) instructional strategies in improving the academic performance of secondary school students in Biology. The study adopted the non-equivalent pretest-posttest control group design. The population comprised all senior secondary school Biology students in Osun state. The sample consisted of Senior Secondary Three (SS3) Biology students in their intact classes selected using multistage sampling procedure. From the three senatorial districts of Osun State, two senatorial districts were randomly selected. Two Local Government Areas (LGA) were sampled randomly from each of the selected senatorial district. Furthermore, one school was randomly selected from each of the selected LGAs to make a total of four schools for the study. Biology Achievement Test (BAT) was used to collect data for the study. Data collected were analysed using analysis of Covariance (ANCOVA). The results showed a significant difference in students' academic performance taught Biology using PBL, ABL, and VCBL ($F = 15.426$, $p < 0.05$), as the marginal means of participants exposed to ABL, VCBL, PBL, and CL instructional strategies are 8.762, 8.546, 8.538 and 7.711 respectively. Therefore, the study found that participants exposed to ABL instructional strategy appeared to perform higher than participants in other groups after treatment.

Keywords: Science Education; Biology; academic performance; 3-inquiry instructional strategies