EFFECTS OF SEQUENTIAL TEACHING METHODS ON ACHIEVEMENT, RETENTION AND TRANSFER OF KNOWLEDGE IN BIOLOGY BY SECONDARY SCHOOL STUDENTS IN KENYA

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ABSTRACT

Despite the importance of knowledge in Biology, candidates’ performance at the national examination; The Kenya Certificate of Secondary Education (KCSE) is poor. This could be attributed to the teaching methods. The purpose of this study was to compare differential effectiveness of Sequential Teaching Methods (STM) on the achievement, retention and transfer of knowledge in Biology by secondary school students. The study was Quasi-experimental using the Non-equivalent control-group design. There were four groups divided into eight (8) sub-groups: four Boys only schools and four Girls only schools to allow for investigation of gender. All the four groups took a pre-test, posttest, knowledge retention test and a transfer test to make a total of 16 observations. The target population comprised students in the 18 old category National Schools in Kenya that were in existence before 2012. Purposive sampling was used to obtain a sample of eight (8) schools and 402 Students. The students in the eight (8) subgroups were taught the same Biology topic: “General Characteristics of Enzymes”, using different sequences of three teaching methods namely: lecture, slide demonstration and laboratory (student experiment). Group I (ELD) began with experiments, followed by lecture method and was lastly shown, animated slides. The sequence of the three different methods used in the first group was altered in both the second and third groups as follows: The lecture method, slide demonstration and laboratory experiment (LDE) for Group II, and slide demonstration, experiment and lecture method (DEL) for group III. Students in group IV (control group) were taught using (oral-only) lecture method. The teachers gave lectures and performed slide demonstration while the students carried out laboratory experiments. In order to quantitatively measure achievement based on the various sequences of teaching the researcher used the Biology Achievement Test (BAT). The test was used as a pre-test and also post-test. In addition, it was also used as a retention test that was administered 40 days after the Post-test BAT. This test had 25 objective questions testing knowledge of facts, application of knowledge and problem solving ability. To measure Transfer of Knowledge, the researcher used Concept Maps as an assessment tool. The four research hypotheses were tested using ANOVA at significant level of 0.05. The results and findings of the study show that STM, when efficiently used in instruction, could enhance immediate post achievement test scores, retention and transfer of knowledge in Biology more effectively than the oratory lecture method predominantly used in Kenyan Secondary schools. Furthermore, DEL sequence was identified as the most effective in comparison to LDE and ELD. The findings of the study will help curriculum developers and teachers to choose the most appropriate sequence to use in Biology.