Abstract

Developed countries have appreciated the importance of Science, Technology, Engineering and Mathematics (STEM) for scientific and technological development. STEM subjects have been posting low results in the Kenya Certificate of Secondary Examinations over the years and we have linked the deteriorating standards to the inappropriate teaching approaches that mainly tend to be teacher-centered and hence compromising the learner-centered approach. Due to the poor teaching methods, we ought to incorporate simulation in science education to foster good grades and this formed the basis of this research. Computation techniques have been applied in many subject areas in tertiary institutions with promising results that tend to be in agreement with experimental data. Our research is a quasi-experimental study and thus we have employed the Solomon-Four-Quasi-Experimental design that enabled us to involve a comparison between two computational groups and two control groups. The control groups served to reduce the influence of confounding variables and allowed us to test whether the pre-test had an effect on our objective. Purposive sampling technique was used to select three schools (A boy school, a girl school and a mixed sex school). Each school was expected to have a computer for simulation. The three schools were further split into four groups (single boy's school, single girl's school, boys from the mixed and girls from the mixed school). Each school provided the form one class and a total of 150 students participated. We taught the concept of the periodic table to all the students, the computational groups were taught using the simulations while the control groups were taught using the regular methodology. After we had taught for a period of one month, all the four groups were tested using a tool verified by Kurder-Richardson 21 Formula and the data analyzed using t-test, ANOVA and Origin 9.0. The results showed that the computation groups posted higher scores in the concept of the periodic table. This research points to the fact that there is an urgent need to re-design the teaching of Science, technology, Engineering and Mathematics fields, by incorporating computation techniques to enhance STEMs.

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