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Using of computer assisted teaching strategy to enhance student motivation in biology in public secondary schools in baringo county, Kenya

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Abstract
This study aimed to analyze the impact of computer-assisted teaching strategies on student motivation in biology in Baringo County. The study used Solomon's Four-Quasi experimental style to perform the investigation. Purposive sampling was accustomed select eight extra-county secondary faculties in Baringo to integrate computer power-assisted Teaching into schoolroom teaching and learning. The investigator selected the study's sample schools employing a stratified sampling technique. The 324 biology students were elite from a sample distribution of additional County secondary schools. The experimental and control teams were randomly chosen using a random variety generator. The testing team got a method that relied on computers, whereas the management groups received traditional instruction. The Biology action check and the Biology Motivation form used two study instruments.
The data were examined descriptively and statistically. Frequency and proportion analyses were used, and the t-test was used to explore the variations between groups. The study's hypotheses were tested with a confidence level of 5%. The study found that mistreatment of the technique will impact student motivation in biology. The results indicate that students were exposed to CATS, and statistical significance was disclosed in students' motivation. The study of CATS is efficient thanks to increasing student motivation in biology courses. The findings from the investigation can facilitate information planners at Kenya's Institute of Curriculum Development in policy development and standard for desegregation and planning CATS programs to extend learning, student accomplishment, and motivation. Biology lecturers ought to contemplate incorporating computer-based teaching techniques into their lessons to boost tutorial accomplishment and motivation.

Keywords: Computer assisted teaching strategy, motivation, student

1. Introduction

At all levels of secondary education, science classes are absolutely necessary.Science education teaches students to use scientific methods and think critically, develops science concepts that help them comprehend the biological and physical environments, and cultivates the appropriate attitudes and abilities for democratic leadership [14]. It is fundamental to the curriculum and essential.

Biology is one of the sciences that deals with natural events. It contributes to the development of biological knowledge and scientific skills that help humanity comprehend the significance of biodiversity, environmental preservation, and resource sustainability [3, 25]. Knowledge of biology is necessary for practically every aspect of human life.Its application in genetic engineering has benefited food security, medicine, and disease and pest control [7, 26].

According to [27], destructive teaching methods, the learner's lack of expertise in the subject, the learner's attitude toward the subject, and the use of ineffective instructional approaches by biology teachers all contribute to low grades. Additionally, a strategy that emphasizes teachers rather than students, a lack of material mastery on the part of some teachers, and a lack of educational and learning resources all contribute to low grades.Even though this performance is ultimately unscientific, it has led to suggestions for a classroom pedagogical approach [8, 9] and, as a result, a rise in scientific field academic achievement.

To encourage learning and cultivate students' curiosity and enthusiasm, the most up-to-date methods, such as CATS, should be used to teach the science curriculum, as stated in [13, 29].

Other researchers advocate for the use of constructivist educational methods like CATS [1, 25, 29] in order to establish a global networked knowledge society. Students should not be exposed to learning methods that require them to actively collect information, evaluate source quality, collaborate, and solve problems instead of passively absorbing authorized material through memory and retrieval.He argues that knowledge generation and skill acquisition strategies should not be available to participants.

Students who are motivated participate more actively in learning activities, which results in improved academic performance [17, 21]. Additionally, activities aimed at specific goals are initiated and sustained by motivation, which acts as an internal stimulator. As a result, a learner-centered approach to learning strategies, such as computer-based learning strategies that encourage active learning participation, will motivate students to learn [30, 32].Students who are inspired perform exceptionally well because they are completely satisfied with the material covered, depending on the teaching strategy used.Students should be encouraged to participate in engaging class activities [10, 15], such as using a computer-based teaching method.

Positive academic performance can be attributed to students' enthusiasm for science [18]. In addition, motivation is influenced by how the instructor presents the material in class during the lesson, as the teacher serves as a source of information. A teacher has a significant impact on the motivation of students to learn by using a variety of teaching decisions [22, 23].The students simultaneously take notes [28]. As a result, employing strategies that boost student engagement during the lesson enhances teacher-student interaction and study motivation [12, 20].

Motivation to learn biology and science is influenced by self-efficacy, an active learning strategy, science learning values, performance goals, achievement goals, and stimulation in the learning environment [3]. These factors are determined by the instructional strategy that requires students to actively participate in class, like the computer-aided teaching approach.Computers and simulations are used in the classroom as part of computer-assisted teaching, depending on the subject matter being taught.The use of computers in education encourages the use of simulation by presenting ideas through diagrams, shading, and sound, which captivates students and piques their interest in the subject. This allows teachers and students to learn at their own pace and fosters a dynamic learning environment [2, 10].

Computer integration in education has been widely implemented throughout the continent [5, 13]. An examination of the effects of computer-based education on the motivation and achievement of middle-level students in the United States revealed that students taught with computers were more motivated to learn than their peers.An African study of computer use in education typically yields results that are consistent with those of other international researchers.Take, for instance, a study by [6] and [19] that demonstrates that employing CATS enhances learning by influencing general motivational variables in Ghanaian senior high school biology students.According to the survey of the investigation into the effect of computer-assisted teaching strategy on students' motivation to learn agriculture in secondary schools in Tharaka Nithi County, students' motivation to learn increases when CATS is used.As a result, little research has been done on how CATS affects biology learning in public secondary schools in Baringo County. In Kenya, studies have been done on how CAL affects motivation [15].

2. Methods and Materials

2.1 Research Design

Style of quasi-experimental analysis, Solomon Four Non-Equivalent Control Cluster design in particularBecause the participants selected were from intact secondary school categories, the researcher used this design;Therefore, it would be impossible to randomly divide each participant into the experimental and control groups.In order to participate in hands-on instruction with students who were exposed to computer-assisted instruction, the experimental group was wisely chosen for the study.The control group, on the other hand, received instruction through direct instruction methods like demonstration, lecture, and discussion.

2.2 Data Collection

The Biology Motivation Questionnaires (BMQ) were the instruments used in the study. These questionnaires are used to see if students are interested in biology after using a computer-assisted teaching method.Thirty Five-Point Likert Scales were used to construct the instrument, which required students to indicate whether they strongly agreed (S.A.), agreed (A), undecided (U), disagreed (D), or strongly disagreed (S.D.) [16]. The scales range from powerful trust to strongly affliction to five points.

2.3 Data Analysis

Using descriptive and inferential statistics, the data were analyzed, and the hypotheses based on the analysis were tested.In order to confirm the variations in the four means and determine whether there is a significant difference between the four teams, multivariate analysis was used.The management and experimental groups' quality differences were examined using a T-test.The investigator also examined the gender of the students and the differences in means between the groups using a variety of t-tests.The null hypotheses that predicted equally or non-significant differences between the groups were rejected or accepted using the t-test and ANOVA at a significance level of =0.05.Statistical Package for the Social Sciences (SPSS) version 24 was utilized for the analysis of the collected data.

3. Results and Discussion

3.1 How Students Reacted to Using a Computer-Assisted Approach to Learn Biology

The questionnaires were distributed to the experimental group to determine how motivated students were to learn biology through computer-assisted instruction.The researcher only distributed the questionnaires to the experimental group.The BMQ has 30 items, and each one has a five-point Likert scale that ranges from:The responses to the questions regarding students' enthusiasm for computer-assisted teaching were selected and analyzed. Strongly Agree (S.A.) equals 5, Agree (A.) equals 4, Undecided (U.) equals 3, Disagree (D.) equals 2, and Strongly Disagree (S.D.) equals 1.

Table 1: Students' Feedback on Computer-Assisted Teaching Strategy

Statement	Mean	Interpretation
It's fun to learn biology on a computer.	2.6125	Not sure
It was fun to learn biology on a computer.	2.7346	Not sure
On a computer, biology is simple to remember.	3.2342	Not sure
It seemed appealing to study biology using a computer.	3.5864	Agree
I can understand what the teacher is saying when I use the computer.	3.7516	Agree
It was fascinating to use the computer in biology instruction.	1.6460	Strongly disagree
I quickly remembered what I had learned in Biology when I used the computer.	4.3134	Strongly Agree
The biology lecture became more appealing when the computer was used.	2.3890	Disagree
I can study biology classes more effectively using the computer.	1.3921	Strongly disagree

Source: Researcher (2018)
Key:1-1.79: strongly disagree; 1.8-2.59: disapprove; 2.6-3.39: uncertain; 3.4-4.19: agree; 4.2-5.0: strongly agree

According to the table's findings, students were unsure whether or not learning biology using a computer-assisted pedagogical approach was enjoyable, engaging, and simple to comprehend.The respondents, on the other hand, agreed that the computer-assisted approach to teaching biology was fascinating and that they easily comprehended what was taught.They also decided that they could quickly remember when they were ready to use a computer-assisted approach.The students' claims that computer-assisted biology instruction was engaging and that they could follow the course easily were strongly refuted.The experimental group's mean post-test score was also examined for its significance.The findings are summarized in Table 2.

Table 2: The Experimental Group's mean BMQ posttest score

Posttest Group	N	Mean	Std. Deviation
Experimental Group one (E1)	82	8.36	2.125
Experimental group two (E2)	81	8.87	2.316
Total	163		

The average post-test scores for the first and second experimental groups, as shown in Table 2, were 8.36 and 8.87, respectively.Their error for experimental group two was 2.316, while their standard deviation for practical class one was 2.125.When the mean scores of the two groups were compared, it became clear that practical class two was more effective than experimental group one.To confirm the null hypothesis that there is no statistically significant relationship between the biology motivation of students in Baringo County who are taught with a computer-assisted teaching strategy and their post-test mean score, a one-way ANOVA analysis was carried out. The results are presented in Table 3.

Table 3: Post-test Mean BMQ Scores for Experimental Groups by One-way ANOVA

	Some of Squares	Df	Mean Square	F	Sig.
Between Groups	2.159	3	0.4520	0.745	.000
Within Groups	1643.214	160	9.2706		
Total	1645.373	163	9.7226		

F was found to be 0.745. The null hypothesis H02, which stated that there is no statistically significant difference in students' motivation in biology when taught using a computer-assisted teaching strategy in Baringo County, was therefore rejected. This meant that there was a statistically significant difference in students' motivation in biology when taught using a computer-assisted teaching strategy. This suggests that, in terms of increasing student motivation, the CATS method is simpler than traditional teaching.

The findings of the study are based on the findings of[24] regarding the effects that computer-based instruction has on student motivation and action in Kenyan business studies classes.Students in the experimental cluster gave the clerking account course in business studies a higher rating than students in the management group, according to the study.

A study on the effects of computer-assisted instruction as a technology tool on achievement and motivation was published in[7]. This study's findings are in line with those of the research.The study looked at how poor students in the United States who were taught art and language using computers and traditional methods were motivated and did well.Students who were exposed to computers were more motivated to learn than students who were exposed to traditional teaching methods, according to the study's findings.

The results of the current study are consistent with those of an earlier one[19] that looked at how computer-assisted instruction affected the performance of Ghanaian secondary school biology students.Utilizing CATS improves learning through generalization, according to the study.

4. Conclusion

The study indicates that students exposed to CATS were additional actuated to be taught biology than those educated through traditional teaching strategies. Thus, CATS may be a higher strategy that ought to use to boost learners' motivation to learn biology.

5. Recommendations

Following the findings of the study, suggestions are made.The CAT method should be used by biology teachers to encourage students to choose engaging, lively, and exciting subjects.

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