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EFFECTS OF ANIMATED-MEDIA STRATEGY ON MOTIVATION AND ACHIEVEMENT OF FLORAL PARTS CONCEPTS AMONG SECONDARY SCHOOL BIOLOGY STUDENTS IN MINJIBIR EDUCATION ZONE, KANO-NIGERIA.

KAMAL, Ahmad Mu`az[1]
Department of Environmental and Life Sciences Education, Modibbo Adama University, Yola
MOHAMMED, Abel Ali[2]
Department of Environmental and Life Sciences Education, Modibbo Adama University, Yola
MUKHTAR, Ahmad Garba[3]
Kano State Senior Secondary School Management Board
Abubakar Hauwa Umaru[4]
Department of Environmental and Life Sciences Education Modibbo Adama University, Yola

ABSTRACT
This study investigated the effect of Animated-media strategy on secondary school students' motivation and achievement in Minibar educational zone Kano-Nigeria. The study was guided by two research questions and two hypotheses. Quasi-experimental research design involving experimental and control group design. The population of the study comprised 2,098 SSII students in public secondary schools in Minjibir Educational Zone. Simple Random Sampling Techniques was used to select the sampled schools the sampled size was 116 students offering biology, intact class was randomly assigned for experimental group, and control group. Floral Parts Concept Achievement Test (FPCAT) and Floral Parts Concept Motivation Questionnaire (FPCMQ) were used to collect data. PPMC and Cronbach alpha were used to ascertain the reliability coefficient for Floral Part Concept Achievement Test and Floral Parts Concept Motivation Questionnaire with 0.79 and 0.83 respectively. Data were analysed using mean and standard deviation for research questions and Wilcoxon and *ANCOVA for testing null hypotheses. The Findings revealed that, biology students taught using Animated-media strategy have higher mean achievement scores, Also, biology students taught using Animated-media strategy were highly motivated. The study recommended that biology teachers should exposed their students to Animated-media strategy to become motivated, retain and improve their academic achievement.*

KEYWORDS: *Animated Media Instructional Strategy, Motivation, Academic Achievement, Floral Parts Concepts.*

INTRODUCTION

Science has been described as a systemic enterprise of gathering knowledge about the world, organizing, and condensing that knowledge into testable laws and theories (Muhammad, Ibrahim & Kubo, 2017). Science aimed at searching for causes and providing reason for solution to phenomena or experience in life. It is seen as a human activity to search for food, shelter, clothing and basic human needs for survival (Zanin, 2015)

For every developing nation to accomplish and sustain national development, a well-planned and implemented science and technology education remains the only means for national development.

Science Education is explained as the study of science subjects (chemistry, physics & biology) with teaching method in order to provides scientific knowledge to learners (Amarin, 2016). Science education deals with teaching of scientific concepts and addressing the learners' misconceptions. As a field of specialization, science education is concern with providing scientific literacy among individuals with high competence for rational thoughts, actions and scientific literacy lead to production of technological manpower (Anita, 2014). Science and technology education and other related disciplines are the key that would enable the learners to have basic knowledge of science and be able to apply it in solving societal problems. Science education is an integrated field of study which considers both the subject matters of science discipline such as biology, chemistry, physics, agriculture etc. as well as the process aimed at providing unlimited opportunities for learning to understand and utilize necessary knowledge, skills, and attitudes required to operate effectively in a scientific and technological society (FME, 2013).

Biology is a natural science that deals with the study of life and living organisms including their physical structure, chemical composition, functions, development, and evolution (Green, 2019). Many societal issues are biology-based, include biodiversity, genetically modified organisms, reproductive technologies, and prolongation of life, food production, tourism industry (biological gardens) and processing industries. Therefore, the knowledge of biology can be acquired through education, specifically biology education. Biology education may be described as the branch of science education which deals with the study of living organisms through ecology, morphology, genetics, physiology, anatomy, behavior, evolution, and distribution of terrestrial and aquatic organisms. Biology education is described as the application of the principles and contents of biology into the field of education (Zanin, 2015). Biology as a discipline, further divided into animals and plants biology. The study of plants shows that there are two types of plants namely, non-green plants and green plants. The green plants are also divided into non-flowering and flowering plants. The non-flowering plants cannot produce flowers. The flowering plants produces flower and flower is made up of the floral parts. Floral parts of a flower are the four key components or the building block of a flower. These four components are: calyx (sepal), corolla (petal), androecium (stamens) and gynoecium (carpel or pistil). The sepals are the external part of a flower that protects the internal structure of a flower. Sepals are typically green and leaf-like, as they are in fact modified leaves, but it is possible for them to be any color depending on the type of plant. In a nutshell, sepals are the outermost of a flower. Petals exist to attract the attention of pollinators to the flower. It is for this reason that they are brightly colored, showy and of interesting patterns and sizes. The stamens are the male reproductive organ of a flower. Each stamen contains two main parts. The filament which is the long cylindrical tendril part of the stamen, while the anther is a sac that sits at the top of the filament (Michael, 2019). To teach this concept of floral parts of a flower, there is need of effective teaching strategy such as Animated-media strategy.

Animated-media teaching strategy is a form of instructional method that makes use of computer animation, graphic and cartoons in classroom instruction. Animated-media instructional strategy also involves the use of two or more different types of animated instructional media in the presentation of lesson. Animated teaching involves the use of Video Compact Disc (VCD), Digital Video Disc (DVD), power point, or 16mm film. Animation teaching could be in form of lesson presentation, using still pictures; texts, graphics, motion pictures, background sounds, accompanied by some narrations to enhance students understanding of concepts. Computer animation is said to be one of the effective technological tools that enhanced the teaching and learning of biological concepts that are dynamic in nature. According to Amarin (2016) animation is a brilliant and innovative way that encourages learners to communicate stories, ideas and learn biological concepts in a creative and original way. It can be particularly useful as a tool in knowledge acquisition that encourages creative thinking in science students. Animations have the power to gain the attention and motivate the learners for hours together without boring them, this is said to be helpful to learners since it have features that aids in learning difficult concepts. Animation combining image, sound and action are used to represents some aspects of reality that are abstract and difficult to demonstrate directly to the learners, Gambari, Falode, and Adegbenro (2014) stressed that the capable features of Animation can enliven the learning experience since it promotes flexibility of learning and allowed a wider range of stimuli thus increased the student engagement in learning. Salisu (2015) revealed that animated-media strategy increases the students' academic achievement and may improve students' retention.

Retention may be described as the ability to store, keep, and bring back or recall past experience and reproduce a learnt material when the need arises (Samuel & Nurudeen, 2019). It is an important variable in learning because only a learnt experience is recalled, learning cannot be said to have taken place if there is no proper retention. Animated media strategy encourages active participation of introduce lesson with audio-visual learning home and students' participation (Okurumeh, 2016). These characteristics of animated media could improving students' knowledge retention because of their participation on relevance activities may enhance students' motivation.

Motivation is also regarded as a psychological construct that triggers and sustains persistence and effort among individuals. It is the urge to do something or to undertake and accomplish an activity. Motivated students devote effort to performing learning tasks, persist when they encounter problems, and regulate their learning (Jovita & Joseph, 2020). Motivation awakens and directs students' minds in teaching and learning. Therefore, this study will examine the effect of animated media strategy on enhancing biology students' academic achievement and motivation.

Statement of the Problem

Despite the importance of biology among Nigerian students, performance at senior secondary school level has been discouraging. John, Ismail and Waziri (2018), Amal and Samar (2018) have shown low academic achievement of students in internal and external examinations. West African Examination Council (WAEC) Chief Examiner's Report (2019, 2020, 2022, 2023 and 2024) shown that the percentage of students who

passed biology at credit level and above fluctuates and have not increased as expected over the years. This poor performance suggests a disconnect between the intended Biology curriculum and the actual teaching–learning practices in schools. In view of these, the researcher's determine to find out the effect of animated-media strategy on motivation and achievements in floral parts concept at secondary schools in Minjibir Education Zone, Kano-Nigeria.

Objectives of the Study

The objectives of the study are as follow to:

1. Find out the effect of animated media strategy on students' academic achievement in Floral parts concept in senior secondary schools in Minjibir Education Zone, Kano State.
2. Examine the effect of animated media strategy on students' motivation in Floral parts concept in senior secondary schools in Minjibir Education Zone, Kano State.

Research Question

The following Research questions guided the study:

1. What is the mean score difference of students' when taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Minjibir Education Zone, Kano state?
2. What is the pretest and posttest mean score difference of students' motivation when taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Minjibir Education Zone, Kano state?

Null Hypotheses

The following null hypotheses were formulated and tested at the significant level of 0.05

$H0_1$: There is no significant difference in the mean academic achievement scores of Biology students taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Mimjibir Education Zone, Kano state.

$H0_2$: There is no significant difference in mean motivation scores of Biology students taught floral parts concept using media animated strategy and those exposed to conventional method in senior secondary schools in Minjibir Education Zone, Kano state.

Theoretical Framework

This study is anchored on Cognitive Theory of Multimedia Learning by Mayer (2001). This theory stated that students can create a deeper understanding of words when they establish connections between words and pictures than from words or pictures alone. Mayer's theory regards the learner as a constructor of his or her own knowledge, actively selecting, organizing and integrating relevant visual and verbal information. This theory further claims that information should be presented in such a way that the learners 'limited working memory resources are employed as efficiently as possible.

Literature Reviewed

Research studies revealed that Thomas and Israel (2014) found that significant difference exists between slow learners taught using animated media strategy and those taught using conventional method. In the same

vein, Owolabi and Oginni (2014) showed that males in the animated media instructional strategy achieved higher mean scores (Mean=31.89) than those in the control group (Mean=23.55.9). These findings support Mayer (2001) Cognitive theory which emphasized that the relation between Cognitive Theory and the design of multimedia instruction signifies of the Two-Way Street between cognition and instruction. Protagonist posited that when the relation between cognition and instruction is a two-way street, psychologists and educators communicate in ways that are mutually beneficial to both psychological theory and educational practice. Multimedia learning requires that students 'get engaged in substantial cognitive processing in verbal and visual presentation (Mayer, 2001).

Methodology

The area of this study was Minjibir Education Zone Kano State Nigeria. The study adopted quasi experimental design involving pre-test and post-test control group design. There are twenty-four senior secondary school with total population of 2,098 students, comprising of 1411 males and 687 females with the average age of 16 years old and above. A total number of 116 SS II biology students were drawn from four public senior secondary schools of Minjibir education zone to form the sample of the study. Subjects were randomly assigned to both experimental and control groups prior to the administration of treatment. Four intact classes (two experimental group and two control group) were used for the study. A stratified sampling technique was used to divide into male and female schools in the zone so that each school have equal chance of being selected. Simple random sampling technique method was used to select four (4) schools. Two instruments were used in this study for data collection, which are: Floral Parts Concept Achievement Test (FPCAT) adapted from WASCCE (2016 to 2021) past question papers with 30 items while Floral Parts Motivation Questionnaire was develop by the researchers which consists of 20 items with a point scale comprising Strongly Agree (SA), Agree (AG), Disagree (D) and Strongly Disagree (SD). The instrument was subjected to both content and face validation by three experts from the Department of Science and Technology Education, Bayero University, Kano. The reliability coefficient for the FPCAT was found to be 0.79 using the PPMC and FPCMAQ was found using Cronbach's Alpha reliability index of 0.83. The data collected were subjected to analysis at two different levels, via: descriptive and inferential statistics levels. The research questions were answered using the descriptive statistics of mean and standard deviation while, the research hypotheses were tested using inferential statistics of Wilcoxon and Analysis of Covariance (ANCOVA) at alpha value 0.05 % level of significance. If P-value is less than 0.05 level of significance, reject the null hypothesis or otherwise do not reject.

RESULT

Research Question One: What is the mean score difference of students' when taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Minjibir Education Zone, Kano state?

Table 1: Mean and Standard Deviation Achievement Scores of Biology Students Exposed to Floral Parts Concept in Experimental and Control Groups.

Group	n	Mean (χ)	Std. Dev.	Mean Difference
Experimental Group	56	21.11	3.953	5.83
Control Group	60	15.28	3.325	

Result in table 1 shows that, the posttest mean achievement scores and standard deviation of experimental group is 21.11 and 3.96, while those in control group are 15.28 and 3.33, the mean difference between the two groups is 5.83. The result shows that, students taught using Animated-media strategy have higher mean achievement scores than those taught using conventional method.

Research Question Two: What is the pretest and posttest mean score difference of students' motivation when taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Minjibir Education Zone, Kano state?

Table 2: Pre and Post Motivation Mean Rank of Experimental and Control Groups.

Group	N	Pre-Mot. Mean Rank	Post Mot. Mean Rank	Mean Rank Gain	Mean Rank Differ.
Experimental	56	3.00	25.43	23.00	17.92
Control	60	23.42	28.37	5.08	

Table 2 indicates the mean rank pre-motivation 3.00 and post motivation of 25.43 for experimental group. It also indicates the mean rank pre-motivation 23.25 and post motivation of 28.37 for control group. Experimental group pre-motivation and post motivation mean rank gains is 23.00 while the control group pre-motivation and post motivation mean rank gain is 5.08. The result also shows the mean rank difference of experimental and control groups of 17.92 in favor of animated media strategy.

Hypotheses Testing

$H0_1$: There is no significant difference in the mean academic achievement scores of Biology students taught floral parts concept with animated media strategy and those taught using conventional method in senior secondary schools in Minjibir Education Zone, Kano state.

Table 3: ANCOVA Result for Achievement Scores of Senior Secondary School Biology Students of Experimental and Control Groups

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	982.416[a]	1	982.416	74.094	.001	.394
Intercept	38358.072	1	38358.072	2892.956	.001	.962
Group	982.416	1	982.416	74.094	.001	.394
Error	1511.540	114	13.259			
Total	40475.000	116				
Corrected Total	2493.957	115				

a. R Squared = .394 (Adjusted R Squared = .389)

Result in table 3 shows the ANCOVA result for the posttest of biology students in experimental and control groups. The p-value is 0.001 which is less than the significance value of 0.05. The result shows that

significant difference exists between the mean achievement scores of experimental and control groups. Therefore, the null hypothesis is here by rejected.

$H0_2$: There is no significant difference in mean motivation scores of Biology students taught floral parts concept using media animated strategy and those exposed to conventional method in senior secondary schools in Minjibir Education Zone, Kano state.

Table 4: Wilcoxon Result for the Motivation of Experimental and Control Groups.

Group	N	Pre-Mot Mean Rank	Post Mot. Mean Rank	Mean Rank Gain	Z-value	P-value	Decision
Experimental	56	3.00	25.43	23.00	5.971	0.001	Rejected
Control	60	23.42	28.37	5.08	5.676		

Table 4 shows the WILCOXON result of motivation level in experimental and control groups. The observed pre-motivation and post motivation Z- value of experimental group is 5.971, while the observed pre-motivation and post motivation Z- value of control group is
5.676. The P value is 0.001 which is less than the significance value 0.05 (0.001< 0.05). Therefore, the null hypothesis is hereby rejected.

Findings of the Study

1. Students taught using animated media strategy achieved higher than those taught with conventional method.

2. The result also indicated a significant difference in the motivation scores of students taught using animated media teaching strategy and conventional teaching methods in favor of animated media strategy.

Discussion

The results from research question 1 and hypotheses 1 presented in Tables 1 and 3 indicate that the mean achievements score of students taught Floral parts concept animated media instructional strategy is higher than those taught using conventional method with grand mean score of 21.11 and the standard deviation of 3.953 in experimental group against 15.28 and 3.325 in control group with mean difference of 5.83. And there is a significant difference in the mean achievement scores of biology students taught biology using animated media instructional strategy and those taught using conventional method. The result agreed with previous findings reported by other investigators such as; Bulut, Ercan and Bilen (2013), Thomas and Israel (2014), whose in their individuals studies discovered that media animated strategy enhancing and facilitating clear understanding of concepts in different subject areas.

The result of research question 2 and hypothesis 2 analysed and presented in Tables 2 and 4 also indicate that the mean motivation scores of experimental group taught using media animated instructional strategy is higher than those taught Floral parts concept using conventional method with grand mean motivation scores of 17.92 and the pre motivation of 3.00 against 25.43 and 23.42 respectively in control group with the mean difference of 28.37 and there is significant difference between the mean motivation scores of the secondary

school biology students taught using animated media instructional strategy and conventional. The findings of this research that reveals the higher motivation and achievement is in agreement with the findings of John, Ismail and Waziri (2018), who investigated the effects of media animated instructional strategy on secondary school students' academic achievement and motivation in biology in Adamawa state, Nigeria. The result of the study revealed that, students taught biology with animated media instructional strategy performed better than those taught with lecture method.

Conclusions

It was concluded that animated media strategy is effective in enhancing student's academic achievement and motivation in Floral parts concept in senior secondary schools in Minjibir Education Zone of Kano State, Nigeria. Animated media strategy has improved students' motivation towards learning Floran parts concepts in senior secondary schools in Minjibir Education Zone, Kano State.

Recommendations from the Study

1. Biology teachers should use animated media strategy to encourage students' active participation during the teaching and learning process.
2. Teachers should as much as possible guide their students in motivating their learning of Biology through the use innovative teaching strategies of animated media Strategy.

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