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Effect of Dictation Strategy on Senior Secondary School Student's Academic Performance in Biology Concepts

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Abstract. The study is concerned with the effect of Dictation Strategy on Biology student's Academic Performance, in Egor Local Government Area of Edo State. Two research questions were raised to guide the study and two hypotheses were formulated and tested at 0.05 level of significance. The study employed a quasi-experimental research design, using pre-test post-test non-equivalent control group design. The population of the study comprised of 10500 SS II Biology students in Mixed public Senior Secondary Schools. The sample of the study consists of students in two intact classes randomly selected by balloting from two schools. One intact SS II class of 40 students: 20 boys and 20 girls served as experimental group while the other intact class of 41 students: 20 boys and 21 girls served as control group. The instrument, Biology Academic Achievement Test (BAAT) was used to collect data and Kuder Richardson formular 20 with an internal consistency coefficient of 0.67 was obtained. The BAAT was used to pre-test both experimental and control group, it was reshuffled and administered as post-test to both groups after the administration of treatment to the experimental group. Paired sample t-test, and ANOVA were used for Data analysis. The findings of the study revealed that there was a significant difference in the post-test and pre-test of students taught concepts of Protista in their Academic Performance using Dictation Strategy and there was no significant interaction effect of Dictation Strategy and sex on Biology students' Academic Performance. It was recommended among others that Biology teachers should incorporate the use of Dictation Strategy in teaching with other methods because it is capable of improving biology students' Academic Performance than the conventional method. It was also recommended that professional organization should organize workshops, Seminars and Conferences for Biology Teachers on the use of Dictation Strategy and its benefit.

Keywords: Dictation Strategy, Biology, Conventional method, Academic Performance and Protista.

1. Introduction

Biology as the science of life is offered in all senior secondary schools in Nigeria. The National Association of Biology Teachers (2005) defined biology as a study of life and its evolution, organisms and their structures, functions, processes, and interactions with one another and with their environment. Biology provides an opportunity for teaching students to develop the ability to apply science concepts and principle in solving everyday life problems. And it is a unique discipline where experiments with living organisms can take place both in the laboratory and in the field. Biology is also a basic prerequisite subject for many fields of study such as Medicine, Agriculture, Pharmacy, Nursing, Bio-technology among others which have immensely contributed to technology. In spite of the imperative nature of the subject, it is pertinent to note that most students, still sees Biology as a very difficult subject to read and comprehend, their reason been that biological words are too difficult to spell and understand, and some students are of the opinion that Biology is too broad. The WAEC Chief Examiners Reports on WAEC results (2015), of senior school/certificate revealed low academic achievement or performance of students in Biology. One of the reasons is due to students' inability to spell technical terms in Biology, this can be seen in the weaknesses found to be common among candidates, which are: Poor handwriting making their work illegible, Poor numbering of questions, Poor spelling of technical terms, Inability to relate structure to function e.t.c.

Slight trend was recorded in the performance of students in Biology in the past twelve years (2010-2021) in May/June WASSCE as seen in the appendix, table 1. where the percentage of

candidates that passed falls below average except in Oller, J. (2021(51.66).

This situation is disturbing and not in the best interest of science and technological growth and development of the country, this is in collaboration with Sureka & Murugesan (2017) in a study indicated that the poor performance of students is mainly; students' attitude to learning; lack of teaching skills and competence of science teachers. Reviewed literatures have also pointed out different reasons for students' poor performance, some of which are due to the difficulty in not been able to spell some biological terms, (that is due to poor biological vocabulary) in Biology. Students see Biology terms as abstract, long and difficult to spell. Biological words like Spermatophyte, Bryophyta, pteridophyta, Chlorophyta, (as found in Classification) others are Hermaphrodite, Chlorophyll, Cytokinesis, Eukaryotes, Oligosaccharides, Osteoblast, Heterozygous, Autotrophic, Pneumatophore, Anaerobic etc. these are amongst such word that are difficult to spell by students.

One of the major problems that have been confronting the Nigerian education system over the years is the poor performance of students in the sciences and Biology in particular, the major reason been the methods used by the teacher to deliver his or her lessons. Modern methods of instruction today have equally emphasized that classroom teaching and learning should consist not only of "chalk and talking, but should equally involve teachers' utilization of other Strategies. Brown (2018) equally noted that since success in leaning biological words is linked to the appropriate and effective Strategy or style of teaching the subject (Biology), he further stressed that when the right instructional Strategy are utilized in the process of teaching and learning it helps in clarifying a particular biological word or term and motivate the interest of the student in wanting to know how to spell even such biological word. He also emphasized a situation where the student could be engaged to learn how to spell such word. In a situation where the right and effective technique is not utilized, meaning student can't build up their own Biology dictionary or vocabulary which is one of the prerequisites for passing the subject, and then meaningful learning will not take place and educational goals and objective would not be fulfilled and thus can result into educational disaster. Teaching Strategies comprises of the principles pedagogy and methods used by teachers to enable students learn better. This covers the overall standards, instructional strategies and process that a teacher follows in the classroom. A good and thorough knowledge of methods of teaching is necessary for the attainment of instructional objectives. Stone and Morris, in Issaac, 2019. Teaching Strategy is a generalized plan for a lesson which includes structure, instructional objectives and an outline of planned tactics, necessary to implement the strategies. Furthermore, Isaac (2019) explains that teaching tactics are that behavior of the teacher which he manifests in the class i.e., the developments of the teaching strategies, giving proper stimulus for timely responses, drilling the learnt responses, increasing the responses by extra activities and so on. When we use the term method, it implies some orderly way of doing something. Thus, we use the terms Strategy as synonyms to signify a series of steps that one takes to employ any general model being used in the classroom. Each of these aspects emanate from a broader and more encompassing model (Orlich, Harder, Callahan, Trevisan, & Brown, 2017:4).

The choice of teaching Strategies depend on what fits you, your educational philosophy, classroom demographic, subject area and so on. It should be noted that there are many factors that complement the teaching Methods for the attainment of this objectives. These Strategies, approach of teaching are as follows: Use of interactive visuals, learning through storyline, Use of polls to encourage participation, relate biology to everyday life, Utilization of team-based learning, Host of virtual field trip and Use of dictation approach.

In Oxford Learner's Pocket Dictionary (2016:119), dictation means "Act of saying words aloud so that somebody can write it down". In addition, Rowland, (2019) states that "Dictation is a Strategy used in both language teaching and language testing in which a passage is read aloud to students or test-takers, with pauses during which they have to write down what they heard as accurately as possible". From the definition, it can be concluded that dictation is a teaching technique that asked the students to hear and write down what have said to them, so that the students are hoped to understand the content of it. (2018:128-129) states as follows: A Strategy that ask students to write down what they have heard instead of saying aloud; the written versions can be checked later either by the teacher or, perhaps more productively, by the students themselves using a correct version called dictation. Spelling dictation is often used in the classroom situation to encourage learner especially in their understanding of some biology concepts. In a traditional spelling dictation, the teacher reads a word, the student writes down and then the teacher checks the writing to see to its accuracy. Dictation can be used to check accurate perception and comprehension as well as spelling. Dictation will be useful when it integrated well with the learning activities. It is a teaching technique which has proved extremely effective at all levels of instruction. It ensures attentive listening, trains

students to learn to transfer oral sounds to written symbols, helps to develop aural comprehension and assists in self-evaluation. Dictation in predicting overall ability has some advantages. The main purpose of dictation is to evaluate the students‟ proficiency about the language or subject being learned through their listening ability. It means that when students do dictation, they do not only pay attention to the sound of the words that is read by the teacher but also understand about the meaning and be able to understand the content.

Dictation is an easily prepared activity that can become a part of the regular classroom routine (Nation,2017:34). Nation classified the variations of dictation into several categories:

Akanbi and Kolawole (2014) also indicated that in other to overcome the challenges of learning and spelling difficult words or abstract Biology concepts, Rowland (2019), have also suggested the use of activity-oriented strategies such as guided inquiry, cooperative learning, demonstrative schematic writing on problems involving difficult words should be use along with dictation strategy and others.

Dictation Strategy is seen as a process of writing down what someone else has said which involves Teacher spelling difficult words, students repeat the word after the teacher and spell it down. It is a tool for learning difficult words. Dictation is recognized in this study and many researchers sees it as a language activity with integrative effect on teaching and learning difficult terminology in secondary school. It often acts as a memorization exercise or spelling check assessment, it is use for facilitating writing skills such as accurate spelling of words hence, dictation activities could develop the mechanical accuracy and vocabulary which enable the students to write on his/her own. Therefore, dictation Strategy is regarded as a listening activity which enable students to comprehend information and react with written text (Richard and Renandya 2017). In addition, the value of dictation Strategy has been given prominence by some researchers, Akman (2019), Hasril, (2015) suggested that dictation Strategy could inspire the learners to discover and modify Ideas into their own words because they think as they write. This study believes that dictation of biological word can serves as a cognitive process where learners need to practice different words and skills so that they would improve their vocabulary development. Also, in this study, Dictation strategy will be a tool to increase the vocabulary of the learner especially in the usage of difficult words.

In addition, attention in this study will have to do with Dictation strategy as a way of improving Biology students' knowledge of Protista and hence their academic performance which is the aim of education.

Furthermore, focus was also on the interaction of gender on students' Academic Performance in this study. Overall, while dictation strategies are beneficial for Academic Performance in biology, tailoring these strategies to accommodate gender differences can further optimize learning outcomes.

In light of the above, it is believed that when students are given the right Strategy of learning they participate more, and the class look interactive and exploratory and as such facilitates mastering Subject. The Dictation Strategy is one of such technique which can make a class more participatory because all hands are on desk as the teacher gives the dictation, and when this is done regularly can improve students' vocabulary skills especially in Biology of which students regard as broad and having difficult to spell words or concepts, Ogu Iheirika, and Emejulu (2019).

1.1 Statement of Problem

The persistent reports of poor achievement and poor Academic Performance of students in Biology among Nigerian students over the years as revealed by literature and WAEC Chief Examiners reports calls for concern especially for teachers of biology and other stakeholders. Also results on student's biology vocabulary skills in senior secondary certificate examination (SSCE) over the years has not been commendable. Biology students' vocabulary over the years in senior school certificate examination has been generally poor too. Failure in this subject area has been attributed to the method, Strategy and techniques of teaching the subject.

In the May/June 2020 Senior Certificate Examination, the Chief Examiners reported that the examination was generally within the learning experience of the candidates, and compared favourably with previous years. However, candidate performance was generally poor in spelling of technical terms related to biology. According to the Chief Examiner report, the students could not spell correctly some of the technical terms in Classification of Protista, as they were required to do in most of the questions relating to other topics, this was not only in the essay questions but also in the practical questions, this may be as a result of the methodology used or employed by the teacher.

Empirical studies involving the use of Dictation Strategy in teaching the concept of Protista and its effect on student's Academic Performance in Biology is very scanty and based on this background, Perhaps the use of Dictation Strategy

could enhance students' Academic Performance in Biology. Therefore, the question is, can the use of Dictation Strategy enhance student's Academic Performance in the Class Protista?

1.2 Research Questions

The following research questions guided the study:
- Is there a. difference between the mean pretest scores and posttest mean scores of students who were taught Concepts of Protista using the Dictation Strategy?
- Is there an interaction effect of method by sex on students' Academic Performance?

1.3 Hypotheses

The following null hypotheses were formulated for this study:

- There is no significant difference between the pretest and post-test mean scores of students who were taught the concept of Protista using Dictation Strategy.
- There is no significant difference in interaction effect of method by sex on students in the experimental group Academic Performance.

1.4 Purpose of Study

The study was designed to examine the effect of Dictation Strategy on the Academic Performance of Biology students in Senior Secondary School especially SSS II students in mixed public schools in Edo State.

2. Methodology

The study employed a pre-test, post-test non randomized quasi experimental design where intact classes were used. The experimental group was exposed to Dictation Strategy and the control group to the Traditional method of instruction. The target population of this study is all Mixed Public Senior Secondary School Two (SS2) in Benin Metropolis. Benin metropolis has three (3) local government areas namely, Egor, Ikpobo-Okha and Oredo. with a total number of 10, 500 Biology students. forty students for the experimental group were taught using the Dictation strategy for six weeks and forty-one of the students for the control group were also taught for six weeks with Conventional method without Dictation strategy. A Biology Academic Achievement Test (BAAT) which was designed by the researcher and validated by biology experts was used to collect data. Its reliability was established. Data collected were collated and analyzed using descriptive statistics. The hypotheses were tested using t-test and analysis of variance (ANOVA) statistic was also adopted since the study involved pre-test and post-test of intact classes. All statistics was tested at 0.05 level of significance.

3. Presentation of Results

Hypothesis 1. There is no significant difference between the mean pretest scores and posttest mean scores of students who were taught the concept of protista using Dictation Strategy.

Table 1: Descriptive Statistics of Mean, Standard Deviation and Standard Error of Paired Sample t-test for the Dictation Strategy

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	11.36	39	4.954	.793
	Posttest	20.15	39	1.785	.285

Table 1 presents the descriptive statistics of the paired sample t-test for the dictation Strategy. The table shows that the pre-test mean score for students taught concept of Protista using the Dictation Strategy was (Mean = 11.36, SD = 4.954) and the post-test mean score was (Mean = 20.15, SD = 1.785). A Paired samples t-test was conducted to evaluate whether there was a difference between the pre-test and post-test mean scores after they were taught Protista using the Dictation Strategy. The summary is presented in Table 2.

Table 2: Summary of Paired Samples t-test of the Effect of the Dictation Method on Student's Academic Performance

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	Sig. (2-tailed)
Pair 1	Pretest Posttest	-8.79487	4.73608	.75838	7.25961	10.33013	11.597	38	.000

The results indicate that the post-test mean score (Mean = 20.15; SD = 1.785) of students' achievement in Academic Performance after they were taught using the Dictation Strategy was significantly higher than the pre-

test mean scores (Mean = 11.36; SD = 4.954); [t(38) = 11.597, p = .000]. The 95% confidence interval of the difference between the means ranged from [7.26 to 10.33]. So, hypothesis 1, which states that there is no significant difference between the pre-test and post-test mean scores of students taught the concept of Protista using the Dictation Strategy was rejected. It can therefore be concluded that the Dictation Strategy has effect on students Academic Performance.

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Hypothesis 2: There is no significant difference in interaction effect of method by sex on students in the experimental group Academic Performance.

Table 3: Summary of 2-Way ANOVA of Interaction Effect of Method by Sex on Students' Achievement in Vocabulary Development

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	325.751[a]	3	108.584	17.487	.000
Intercept	25569.762	1	25569.762	4117.802	.000
Method	300.912	1	300.912	48.459	.000
Sex	1.617	1	1.617	.260	.611
Method * Sex	11.258	1	11.258	1.813	.182
Error	465.717	75	6.210		
Total	26785.000	79			
Corrected Total	791.468	78			

a. R Squared = .412 (Adjusted R Squared = .388)

The F-value for interaction effect of method by sex in Table 3 is1.813 with df = (1, 75) and p-value =.182. Testing at an alpha level of 0.05, the p-value (.182) is greater than the alpha level (0.05), so hypothesis 2, which states that there is no significant interaction effect of method by sex on students' achievement in Academic Performance was retained. It was concluded that there was no method by sex interaction effect on students' Academic Performance.

4. Discussion of Findings

This study investigated the effect of Dictation Strategy on student's Academic Performance in senior secondary schools. Hypothesis one was tested using Paired Sample t-test while Two-way Analysis of Variance (ANOVA) was used to test hypothesis two. All hypotheses were tested at 0.05 level of significance.

The findings of hypothesis one according to Table 1 indicate that the posttest mean score (Mean = 20.15; SD = 1.785) of students' Academic Performance after they were taught using the dictation method was significantly higher than the pretest mean scores (Mean = 11.36; SD = 4.954); [t(38) = 11.597, p = .000]. The 95% confidence interval of the difference between the means ranged from [7.26 to 10.33]. So, hypothesis 1, which states that there is no significant difference between the mean pretest scores and posttest mean scores of students taught Protista using the Dictation method was rejected.

The findings also show no interaction effect of gender and method on student biology Academic Performance. This means that regardless of gender, Dictation Strategy improves both male and female students' Academic performance in biology.

5. Conclusion

Based on the findings of the study on the effect of Dictation strategy on student Vocabulary Development in Benin Metropolis, the following conclusions were made:

- Dictation Strategy improved the student Academic Performance on the Concept of Protista more than the Conventional method and this can largely increase performance of student in their internal and external examinations.
- There was no significant interaction effect between Dictation Strategy and gender of the student Concept of Protista as measured by test on Biology Academic Achievement Test (BAAT).
- Also, based on the findings of this study, it is concluded that students' Academic Performance is dependent on the instructional method. This is hinged on the fact that students taught with Dictation Strategy perform better than those taught with the Conventional method.

6. Recommendations

Since the use of Dictation Strategy improved the Academic Performance of students in biology concepts, the following recommendations were made:

- Teachers are enjoined to use Dictation strategy side by side with other methods of teaching
- School principals should make provisions in the school time table for biology teachers to give students Dictation of biological concepts after the conventional teaching method.
- Stakeholders should organize workshops, seminars and conferences for biology teachers on the use of Dictation strategy and state its benefit to the teacher.
- Finally, teachers should create an atmosphere conducive and equal for learners to have adequate learning experience.

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