

## EFFECTS OF SEMANTIC-NETWORK TEACHING STRATEGY ON MEMORY RECALL OF MALE AND FEMALE STUDENTS WITH HEARING IMPAIRMENT IN OYO STATE, NIGERIA

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### Abstract

*The study investigated Effects of Semantic-Network Teaching Strategy on Memory Recall of Male and Female Students with Hearing-Impairment in Oyo State, Nigeria. A non-randomized quasi-experimental research design was employed in this study. The two public schools for the hearing-impaired students were involved in the study with a total population of 144 SSS I hearing-impaired students (82 female and 62 male). Memory Recall Test (MRT) was used to determine the information recall level of the two categories of students assigned to both the treatment and control groups. The memory recall test (MRT) contained objective items drawn from 2023 National Examination Council (NECO) English Language. The two (2) teaching modules developed by the researcher tagged 'Semantic-network Teaching Module' (SNTM) and 'Lecture method Teaching Module' (LMTM) were used to teach hearing-impaired students in the treatment group and the control group respectively. The reliability coefficient value of 0.76 was obtained. The finding revealed that sampled hearing-impaired students have average memory recall level. There was no significant gender difference on memory recall of students with hearing-impairment exposed to semantic-network teaching strategy. There was no significant interactive effect of both group and gender on memory recall of students with hearing-impairment students. The following recommendations among others were made; the cognitive schema of students with hearing-impairment should be well-broaden using concepts-related-approach and nodes as well as appropriate sorting and organisation(s) to enhance their memory recall. That Educational psychologists and curriculum planners during seminars and workshops should amplify that semantic-network teaching strategy should be used to teach all students with hearing-impairment regardless of gender.*

**Keywords:** Memory, Semantic Memory, Memory Recall, Semantic-network, Hearing-Impaired Students.

### Introduction

The roles of memory in the teaching/learning process cannot be overemphasized. Semantic memory as cognitively-organized networks of connected ideas or relationships called schemata with different concepts or ideas grouped under larger categories. Meanwhile, the memory of personal experiences is called episodic memory, a mental movie of things we have seen or heard which may include flashbulb memory, in which an occurrence of an important event fixes mainly as visual and auditory memories in a person's mind (Slavin, 2007). Over sixty years, education of the hearing-impaired was dominated by an ongoing international debate surrounding different approaches to it. Leeson (2007) observed that policy shifted towards the use of an oral approach in the early twentieth century which then caused major difficulties for members of the hearing-impaired community, in that a strictly enforced oral policy was often accompanied by a diminished use of sign language. This made it difficult for many deaf pupils to access the curriculum in schools as they couldn't understand what the teachers were

teaching.

Heward (2000) who believed that individuals with significant degrees of hearing loss do find it difficult to learning easily. As a result of this challenge then suggested that hearing-impaired students would depend heavily on their sight to engage in communication for academic and non-academic purposes. On the other hand, persons with mild or moderate levels of hearing loss could with some amplification meaningfully engage in verbal communication, this then suggest that the latter group has a better prospect in school learning than the former since a lot of school instructions are done orally than manually. In essence semantic-network is a knowledge representation tool consisting of a framework of semantically-related terms, with the purpose of synergising those words through their relationships.

Ayoka and Akinyemi (2014) found that a significant effect of memory teaching on the academic performance of Basic Seven students with hearing-impairment in Mathematics. Male and female hearing-impaired students who have difficulty adjusting to teachers' teaching methodology will often show difficulty in learning. Teti (2005) in an experiment discovered that both male and female are different in the ability to recall some information in serial-effect strategy because both were able to recall more than half of words relating to each gender than words relating to opposite gender. Therefore, it as a result of the above gap that this study seeks to investigate Effects of Semantic-Network Teaching Strategy on Memory Recall of male and female Students with Hearing-Impairment in Oyo State, Nigeria

### **Statement of the Problem**

From the background, it could be adduced that the memory recall of students with hearing-impairment in the Junior Secondary School Examination subjects sampled as well as in the pre-test conducted by the researcher indicated certain memory recall challenges. Students with hearing-impairment do not have the auditory, coherent or linguistic codes that underlie memory functioning like hearing individuals which then raised the question as to whether there are alternative teaching strategies that can support their information retention. Douglass, Louis, Alison and Edward (2006) revealed that information coded visually tends to fade much more quickly from the memory than information that is encoded acoustically while Johnson (2005) asserted that the most persistent problem of recall concerns how difficult past experiences are retrieved and utilized. Improving educational outcomes will require efforts on many fronts, but a central premise of this is that, one part of a solution involves helping students to better regulate their learning through the use of effective teaching strategies.

Cognitive and educational psychologists have been developing and evaluating easy-to-use learning techniques that could help students with hearing-impairment achieve their learning goals. The gap which this research sets out to fill therefore is on how semantic-network teaching strategy can be used to improve memory recall of the secondary school of male and female students with hearing-impairment in Oyo State as a result of their inability to acquire information using the auditory organ.

### **Purpose of the Study**

This study, therefore, seeks to investigate the effects of semantic-network teaching strategy (SNTS) on memory recall of hearing-impaired of male and female students in Oyo State, Nigeria. Specifically, the study was carried out to determine:

1. the level of memory recall of hearing-impaired students exposed to SNTS and LM; in Oyo State
2. the Mean Score of the Control and Treatment Groups
1. the significant difference of gender on memory recall hearing-impaired students exposed to semantic-network teaching strategy
2. the significant difference of gender on memory recall hearing-impaired students exposed to

semantic-network teaching strategy

### Research Questions

The following research questions were raised to guide the conduct of this study:

1. What is the level of memory recall of students with hearing-impairment in both Treatment and Control groups?
2. What is the Mean Score of the Control and Treatment Groups?

### Research Hypotheses

The following null hypothesis were formulated and tested in the study.

**H<sub>01</sub>:** There is no significant difference of gender on memory recall hearing-impaired students exposed to semantic-network teaching strategy

**H<sub>02</sub>:** There is no significant difference of gender on memory recall hearing-impaired students exposed to semantic-network teaching strategy

### Methodology

This study adopted non-randomized quasi-experimental research design was employed in this study, specifically; the non-randomized pretest-posttest design was used to carry out the study. The population for the study included all hearing-impaired students in Oyo State public secondary schools. As at the time of this study, there were 513 hearing-impaired students across the hearing-impaired schools in Oyo State. The target population for this study were all SSS I hearing-impaired students in Oyo State since they have sat for the junior secondary school certificate examination. The two public schools for the hearing-impaired students were involved in the study with a total population of 144 SSS I hearing-impaired students (82 female and 62 male). Memory Recall Test (MRT) was used to determine the information recall level of the two categories of students assigned to both the treatment and control groups.

The memory recall test (MRT) contained objective items drawn from 2023 National Examination Council (NECO) English Language. Each of the 20 questions in the objective aspect of the instrument had options lettered A to E. The students were guided by the instructions to answer the test items. The two (2) teaching modules developed by the researcher tagged ‘Semantic-network Teaching Module’ (SNTM) and ‘Lecture method Teaching Module’ (LMTM) were used to teach hearing-impaired students in the treatment group and the control group respectively. The reliability of Memory Recall Test (MRT) was determined using the test-re-test method after administering it to 20 SS I hearing-impaired students in Kwara State School for Special Needs, Ilorin, twice at an interval of 4 weeks. The scores generated from the two times administrations were subjected to the Pearson’s Product Moment Correlation (r) (PPMC) technique which yielded coefficient value of 0.76. Percentage and frequency count was used to answer the demographical data of the respondents and the research question one. Mean was used to answer the research question two and hypotheses were tested using ANCOVA at 0.05 level of significance.

### Results

#### Demographic Characteristics of the Students

This section presents information on the personal information of the students using percentage as illustrated below:

**Table 1: Gender Distribution of the Students**

Gender	Frequency	Percentage
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Male	62	43.1
Female	82	56.9
<b>Total</b>	<b>144</b>	<b>100.0</b>

Table 1 revealed that out of 144 hearing-impaired students, 62 (43.1%) were males, while 82 (56.9%) were females. This implies that there are more female hearing-impaired students than the male counterparts.

### Answering of Research Questions

**Research Question 1:** What is the level of memory recall of students with hearing-impairment in both Treatment and Control Groups?

**Table 2: Levels of memory recall of hearing-impaired students in both Treatment and Control groups**

Level of Recall	Scores Range	Frequency	Percentage
High	13.35-20.00	31	21.53
Average	6.68-13.34	86	59.72
Low	0-6.67	27	18.75
<b>Total</b>	<b>0-20.00</b>	<b>144</b>	<b>100.00</b>

Table 2 revealed that the hearing-impaired students in the high-level memory recall category were 21.53%, while 59.72% were found in the average memory recall level category and 18.75 were found to be at the low memory recall level category. Therefore, the mean score (12.56) indicates that sampled hearing-impaired students have average memory recall level.

**Research Question 1:** What is the Mean Score of the Control and Treatment Groups?

**Table 3: ANCOVA Result Indicating Mean Score of the Control and Treatment Groups**

Groups	Mean score
Control group	6.1429
Treatment group	12.6737

Table 3 revealed that the mean score of hearing-impaired students in the treatment group (12.6737) was greater than the mean score of hearing-impaired students control group (6.1429). This can be ascertained by comparing the mean scores of control and treatment groups.

### Testing of Hypotheses

**H<sub>01</sub>:** There is no significant difference of gender on memory recall hearing-impaired students exposed to semantic-network teaching strategy.

**Table 4: ANCOVA Result illustrating effect of gender on Memory Recall of Hearing-impaired Students exposed to Semantic-Network Teaching Strategy**

Source	Type III Sum of Squares	Df	Mean Squares	F	Sig.	Decision
Corrected Model	30.041	2	15.020	2.770	.068	
Intercept	4295.636	1	4295.636	792.230	.000	
Pretest	9.418	1	9.418	1.737	.191	
Gender	14.319	1	14.319	2.641	.108	NS
Error	498.843	92	5.422			
Total	15788.000	95				
<b>Corrected Total</b>	<b>528.884</b>	<b>94</b>				

Table 4 revealed that the calculated F - value is 2.641 computed at 1.92 degree of freedom (df) and at 0.05 level of significance. Since the calculated sig .108 is greater than 0.05 alpha level (.108 > 0.05), therefore hypothesis 1 is accepted. This implies that there was no significant gender difference on memory recall of hearing-impaired students exposed to semantic-network teaching strategy in the treatment. This can be ascertained therefore that the mean score of male students (11.0645) was numerically higher than the mean score of the female students (9.9878) but was not significant.

**H<sub>02</sub>:** There is no significant interactive effect of group and gender on memory recall of hearing-impaired students.

**Table 5: ANCOVA Result Illustrating the Interactive Effect of Group and Gender on Memory Recall of the Hearing-impaired Students**

Source	Type III Sum of Squares	df	Mean Squares	F	Sig.	Decision
Corrected Model	1516.016 <sup>a</sup>	4	379.004	69.174	.000	
Intercept	1980.886	1	1980.886	361.512	.000	
Pretest	66.871	1	66.871	12.205	.531	
Groups*Gender	.067	1	.067	.012	.912	NS
Error	761.581	139	5.479			
Total	18007.000	144				
Corrected Total	2277.660	143				

Table 5 revealed that the calculated F – value is .012 computed at 1,139 degree of freedom (df) and at 0.05 alpha level of significance. Since the calculated Sig. .912 is greater than 0.05 alpha level (.912 > 0.05), therefore hypothesis 2 is accepted. This implied that there was no significant interactive effect of gender and group on memory recall of hearing-impaired students.

**Summary of Finding**

This study examined the Effects of Semantic-Network Teaching Strategy on Memory Recall of Students with Hearing-Impairment in Oyo State, Nigeria. Thus, the finding of this study was summarized as follows;

1. The mean score (12.56) indicates that sampled hearing-impaired students have average memory

recall level.

2. There was no significant gender difference on memory recall of students with hearing-impairment exposed to semantic-network teaching strategy. Thus, it is worthy to note that the mean score of male students (13.1860) was higher than the mean score of female students (12.2500) but was not significant.

There was no significant interactive effect of both group and gender on memory recall of students with hearing-impairment students ( $0.912 > 0.05$ ).

### **Discussion of Findings**

Hypothesis one revealed that there was no significant gender difference on memory recall of hearing-impaired students exposed to semantic-network teaching strategy in the treatment. Based on this result, the null hypothesis was accepted. This finding of this study on gender was supported by the finding of Akinpelu (1998) in a study which revealed no significant variability in the performance of both male and female students hearing impairment in an experiment despite the fact that male students scored higher marks than their female counterparts. The finding of the study was buttressed by the finding of Ayoka and Akinyemi (2014) in an experiment on storage and retrieval of information among secondary school students with hearing-impairment and thus found no difference in the performance of both male and female students despite being exposed to the same independent variable and other the same condition

Hypothesis two revealed that there was no significant interactive effect of gender and group on memory recall of hearing-impaired students. Based on this result, the null hypothesis was accepted. The finding of Adewuyi and Ayenibiowo (2013) also corroborated the finding of this study based on gender since the outcome of their research revealed no difference in the performance of both male and female students with hearing-impairment. Meanwhile, there was no significant interactive effect of both group and gender between students with hearing-impairment exposed to semantic-network teaching strategy (SNTS) and students with hearing-impairment exposed to lecture method (LM).

### **Conclusions**

Based on the findings of this study, the followings were the conclusions. Semantic-network teaching strategy was effective in the memory recall of hearing-impaired of male and female students. There was no significant gender difference on memory recall of students with hearing-impairment exposed to semantic-network teaching strategy. There was no significant interactive effect of both group and gender on memory recall of students with hearing-impairment students. It is worthy to note that semantic-network teaching strategy (SNTS) proved superior to lecture method (LM).

### **Recommendations**

Based on the findings of the study, the following recommendations were made.

- a. The cognitive schema of students with hearing-impairment should be well-broaden using concepts-related-approach and nodes as well as appropriate sorting and organisation(s) to enhance their memory recall.
- b. That Educational psychologists and curriculum planners during seminars and workshops should amplify that semantic-network teaching strategy should be used to teach all students with hearing-impairment regardless of gender.
- c. Teachers should make use of semantic-network teaching strategy in teaching students with hearing-impairment, given priority to information clustering and graphical representation.
- d. Teaching should accommodate proper encoding and retention of information in line with related concepts for the purpose of aiding quick recall.



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