Locus of Control, Interest in Schooling and Science Achievement of Some Deaf and Typical Secondary School Students in Nigeria

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Abstract

This study compared locus of control, interest in school and science achievement of typical and deaf secondary school students. The study also investigated influence of students' locus of control and interest in school on general science achievement. Seventy two (72) deaf and 235 typical children were purposively selected from eight secondary schools from Oyo and Ogun States in Nigeria. Three instruments were used to collect data. They are: Locus of control questionnaire, Interest in schooling questionnaire and Science achievement test. Interest in school and locus of control when taken together accounted for 25.6% of the total variance in science achievement (R^2= 0.256, $p < 0.05$). There was significant difference in locus of control and interest in school between deaf and typical children. Typical children significantly tended towards external locus of control ($t = 4.416$, $p < 0.05$) and also had more interest in schooling ($t = 5.747$, $p < 0.05$) than their deaf counterparts. Typical children also performed significantly better than their deaf counterparts ($t = 7.294$, $p < 0.05$). Teachers should make schooling more interesting especially to deaf students. Necessary facilities should be provided for the deaf students to enhance their teaching so that their achievement in science will be at par with their hearing counterparts.

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Generally deaf children tend to be difficult to train because of language problem faced in the cause of teaching them. However, this does not mean they are less intelligent than typical children. Language is a major key to whatever else the deaf children may wish to learn in and outside the school. This set of children cannot hear simple language thereby causing their being neglected in the society. Ysseldyke and Algozzine (1991) observed that hearing impairment adversely affects a child's educational performance. Aloba (1992) explained that language is a

means by which experience is crystallized and structured, hence a lack of or limitation of it will lead to a reciprocal restriction in the ability to integrate experiences.

Loss of hearing apparently affects deaf children learning style so that they often depend on visual learning modalities. Most of the time, the deaf children have distorted access to the flow of language and information in the environment, hence they quite reasonably demonstrate under achievement in language, conceptual knowledge and abstract concepts. Mba (1995) noted that defective hearing creates barriers to developments and brings about disorganization of the individuals. This is because language is involved in the cognitive processes of thinking, memory, reasoning, planning and problem-solving while it is used in directing different activities. However, Moore (1982) and Abang (1988) explained that the condition of deafness imposes no limitation on the cognitive capabilities of individuals since deaf people have been found to function within the typical range of intelligence. It is therefore imperative that social and academic facilities that can improve their well-being be extended to them. More so, the National Policy on Education stresses the need to give equal opportunity to all children, their physical, mental and emotional disabilities not withstanding (FGN, 1981).

Locus of control is conceptualized on a dynamic dipolar continuum spanning from internal to external. Internal locus of control is characterized by the belief that consequences are failures resulting from one's own behavior. Thus, individual who believe that their successes or failures result from their own behaviors possess an internal locus of control while external locus of control is characterized by the belief that consequences are a result of fate or luck.

Chapman and Beersman (1997) defined locus of control as individually perceived sources of control over certain behaviors or events. The concept of internal and external locus of control has important consequences for children's academic development. Students who take responsibility for their academic achievement perform better on standardized achievement tests and in overall grade point average (Dweck & Licht, 1980; Stipek & Weisz, 1981; Ogunkola, 2003). On gender and locus of control, Okeke (1992) found out that males and females differ in their pattern of attribution of success and failure. In academic situation, girls are more likely to see success as caused by ability than are boys. In failure situation, girls are more likely than boys to attribute their failure to lack of ability than lack of effort. Though, Ogunkola (2003) also reported that internal locus of control students performed significantly better than their external locus of control counterparts, however, there was significant difference between the performances of male and female students with internal locus of the performance of male and female with external locus of control.

Interest is an affection state which appears to be a reflection of central feature of relationship between value of system individual and the environment (Busari, 1999). Olusi (2005) reported that students' achievement in science is high and students' interest generally affects academic achievement. He further explained that though interest in education alone does not bring about success in science, it however increases the probability of success. For example, Olatoye and Oloyede (2004) reported positive significant relationship between interest in schooling and study habit. A student who is not interested in schooling is likely to have poor study habit and also be frequently absent from school.

Most studies on locus of control and interest in schooling have been carried out only on hearing students. There is a need for a study like this that compares hearing and deaf students. Abang (1988) asserted that deafness imposes no limitation for cognitive capabilities. In the search for technological and scientific development, there is need to consider factors that can enhance science achievement. Some of the students offering science now, deaf or hearing will eventually become future scientists and engineers. If deaf students are neglected in science education studies, the outcomes of research may be biased. Scientific development in a nation gives birth to economic and political freedom. All the nations that are advanced economically today are also those that have advanced in science and technology (Olatoye, 2008). In the quest for scientific advancement and economics independence, developing countries like Nigeria need to take conscious efforts at lifting up the standard of science achievement. This study therefore investigated combined and relative influences of locus of control and interest in schooling on science achievement of deaf and hearing students in Oyo and Ogun States, Nigeria.

Research Questions

The following research questions were raised to guide the study:

1. To what extent will locus of control and interest in schooling taken together predict student science achievement?

2. To what extent will locus of control alone predict student science achievement?

3. To what extent will interest in schooling alone predict students' science achievement?

4. Is there any significant difference in deaf and hearing students' (i) Locus of control (ii.) Interest in schooling (iii.) Science achievement?

Methodology

Research Design

This study adopted an ex-post facto research design. In such design, the dependent and independent variables have already occurred, the researcher cannot manipulate them.

Sampling Technique and Sample

The target population for this study comprised all the deaf and hearing students in junior secondary three levels in Oyo and Ogun States. From each state, two Local Government Areas (LGAs) were judgmentally selected for the study. The reason for using judgmental sampling technique was because of the deliberate attempt to include schools with deaf students in an inclusive setting. Only few schools admit deaf students. Eight schools were therefore judgmentally selected from the Local Government Areas chosen from the two states. Selection of students for participation was based on student willingness and interest. In all the eight schools (two schools from each LGA), all the deaf students were encouraged to participate because they were fewer in number than the hearing students. However, a sample of about forty hearing students was selected from each school. A total of 72 deaf students and 235 hearing students

participated in the study. The average age of the students is 13.2 while the age range is 12-17 years.

Instrumentation
Three research instruments were used to collect data. They are:

(i) Locus of Control Questionnaire (LCQ)

(ii) Interest in Schooling Questionnaire (TSQ)

(iii) Student Achievement Test (SAT)

i. Locus of Control Questionnaire LCQ
LCQ was constructed by the investigators to assess students' attribution style. Locus of control has to with how students rate the source(s) or cause (s) of events that happen to them. LCQ contains Section A which elicits information on some background characteristics such as age, name of school, and gender. There are 14 items on the LCQ.

Examples are:
'Most of the things that happen to me are due to ill luck'
'I know I can make it if I work hard'.

The students are to, 'Strongly Agree', 'Agree', 'Disagree' or 'Strongly Disagree' with each statement. A student who strongly agrees with the first example above is likely to belong to external locus of control. On the other hand, a student who strongly agrees to the second example is likely to belong to internal locus of control. When a student attributes whatever happens to his or her own behavior or attitude, he or she belongs to internal locus of control. Those who attribute what happen to them to external factors such as fate or ill luck belong to external locus of control. The initial version of the questionnaire was given to expert for suggestions and modification. The Cronbach alpha reliability co-efficient is 0.712.

Interest in Schooling Questionnaire (ISQ)
This is a twelve-item questionnaire designed to elicit information on students' interest in schooling. The students are to 'Strongly Agree', 'Agree', Disagree' or 'Strongly Disagree' with each statement on ISQ. Examples of items on ISQ are:
'I enjoy activities carried out in school'
'I attend classes regularly'

The initial version of the questionnaire was given to experts for suggestions and modification. The Cronbach alpha reliability co-efficient is 0.733.

Science Achievement Test (SAT)
SAT was constructed by the researcher to determine the level of students' achievement in science. SAT is a 30-item multiple-choice objective test items. To ensure content validity, the researchers went to the various schools to collect their schemes of work and also to know how much content

had been covered. The test covered the various topics already taught in all the schools. Some experienced secondary school teachers went through the items before coming up with the final version after corrections had been made based on expert suggestion.

Each item is followed by four options A to E. Examples of items on SAT are:

1. Hydra is able to perform the following functions except
   a. feeding b. movement c. photosynthesis d. ingestion
2. Excessive bleeding from an injury may be due to lack of vitamin _____
   (a) A (b) B (c) D (d) K

Procedure of Data Collection

It is important to state here that because of the peculiarity of the deaf students involved in this study, the study required some extra planning. The teachers of deaf were already informed before the test and questionnaires were administered. The teachers of the deaf students were on ground throughout the period of data collection to assist the researcher explain the purpose of the study to the deaf students and to solicit their co-operation. Teachers of the deaf students used sign language to communicate with their students. It was also noted that deaf students are more restless and have short attention span compared to their hearing counterparts. With patience and encouragement they participated actively in the study. The same instruments were administered on the deaf and hearing students. It was also observed that hearing students completed the questionnaires and answered the achievement test questions faster than their hearing counterparts.

Method of Data Analysis

Data analysis was done using regression and t-test statistics. The research questions were answered using a two-tailed test at 0.05 level of confidence.

Results of Data Analysis

Researcher Question 1: To what extent will locus of control and interest in schooling taken together predict student science achievement?

Table 1: Locus of control and interest in schooling as predictors of science achievement

R = 0.506 R square = 0.256 Adjusted R square = 0.251 Standard Error = 4.512						
Analysis of Variance						
	Sum of Squares	**df**	**Mean Square**	**F**	**P**	**Remark**
Regression	**212.436**	**2**	**1060.218**	**52.070**	**0.000**	**Significant ($p < 0.05$)**
Residual	**6169.572**	**303**	**20.361**			
Total	**8289.948**	**305**				

In Table 1 above, locus of control and interest in schooling when taken together account for 25.6% of the total variance in student science achievement (R square= 0.256, $p < 0.05$). The percentage is statistically significant. These two variables (locus of control and interest in schooling) are very important factors to take into consideration in order to enhance science achievement both of hearing and deaf students.

Research Question 2: To what extent will locus of control alone predict student science achievement?

Table 2: Locus of control as a predictor of science achievement

R = 0.351 R square = 0.123 Adjusted R square = 0.120 Standard Error = 4.889						
Analysis of Variance						
	Sum of Squares	**df**	**Mean Square**	**F**	**P**	**Remark**
Regression	**10211.791**	**1**	**1021.791**	**42.738**	**0.000**	**Significant ($p < 0.05$)**
Residual	**7268.156**	**304**	**23.908**			
Total	**8289.948**	**305**				

In Table 2 above, locus of control singularly accounts for 12.5% of the total variance in student science achievement (R square = 0.123, $p < 0.05$). This percentage contribution is statistically significant. Locus of control is therefore very relevant in predicting student science achievement.

Research Question 3: To what extent will interest in schooling predict student science achievement?

Table 3: Interest in schooling as a predictor of science achievement

R = 0.502 R square = 0.252 Adjusted R square = 0.249 Standard Error = 4.518						
Analysis of Variance						
	Sum of Squares	**df**	**Mean Square**	**F**	**P**	**Remark**
Regression	**2085.762**	**1**	**2085.762**	**102.201**	**0.000**	**Significant ($p < 0.05$)**
Residual	**6204.186**	**304**	**20.409**			
Total	**8289.948**	**305**				

In Table 3, interest in schooling alone accounts for 25.2% of the total variance in science achievement (R square = 0.252, $p < 0.05$). This percentage contribution is statistically significant. Interest in schooling is a good predictor of student science achievement. It should be noted that though each of the independent variables (locus of control and interest in schooling) accounts for significant variance in students' science achievement, however, interest in schooling accounts for a greater percentage.

Research Question 4: Is there any significant difference in deaf and hearing students'
(i) Locus of control (ii) interest in schooling and (iii) science achievement

Table 4: Locus of control, interest in schooling and science achievement of hearing and deaf students

Variables	Student type	N	Mean	Standard deviation	Standard Error	df	t	p	Remark
Locus of control	Hearing	235	44.202	5.754	0.375	305	4.416	0.000	*
	Deaf	72	40.986	4.629	0.478				
Interest in Schooling	Hearing	235	47.214	6.638	0.433	305	5.747	0.000	*
	Deaf	72	42.632	4.624	0.545				
Science Achievement	Hearing	235	11.562	5.143	0.336	305	7.294	0.000	*
	Deaf	72	6.803	3.516	0.417				

Significant ($p < 0.05$)

In Table 4, there is significant difference between hearing and deaf students on each of the variables. Hearing students have higher locus of control than their deaf counterparts. The scoring/coding of the locus of control was done such that strongly agreeing to an internal locus of control statement has a maximum of 4 points on an item. Hearing students also have significantly greater interest in schooling and significantly higher achievement in science.

It should however be noted that the achievement of students in science is generally poor both among the deaf and hearing students. The mean score for deaf students is 6.803, while that of hearing student is 11.562. In both cases, the average score is less than half of the maximum obtainable score of 30.

Discussion of Findings

Findings from the study show that the hearing students tend to be have internal locus of control significantly greater than their deaf counterparts. In a study carried out on the influence of locus of control on hearing student academic achievement, Uguak, Elias, Uli and Suandi (2007) reported that majority of the respondents (specifically 96%) of the learning responds were characterized to have internal locus of control. Also, the results revealed that locus of control were significant and positively related to academic achievement. The direct positive influence of locus of control on academic achievement in this study is therefore not surprising. This is because many studies have reported that locus of control influence many other achievement-related factors. For example Estrada, Dupoux and Wolmax (2006) reported a significant positive relationship between locus of control and both social adjustment and personal emotion adjustment. The hearing students were able to perform better in science than their deaf counterparts probably because the attribution orientation of the hearing students tends more

towards internal than their deaf counterparts. Ogunkola (2003) found that students who had internal locus of control orientation performed better than those who tended to the external.

It is also not surprising that interest in schooling of the deaf students is significantly lower than that of their hearing counterparts. Oyewumi (2004) identified some problem areas of adolescents with hearing impairment. He identified problem of coming to the term with their body image, problem of achieving independent identity and tendency to be aggressive. If the school environment is not encouraging, all these factors can reduce interest in schooling of students with learning impairment. Mba (1995) noted that defective hearing creates barrier to development and brings about disorganization of the individuals. The fact then remains that language is involved in the cognitive processes of thinking, reasoning, planning and problem-solving which is used in directing different activities. To this end, interpreters will surely facilitate the acquisition and use of language and improve the educational development of persons with hearing impairment. Schools should be made interesting to students especially the deaf by providing interpreters and facilities that will make learning easy for them.

Olatoye and Ogunkola (2008) found positive significant relationship between students' interest in schooling and the achievement in science. Also, interest in schooling significantly influenced achievement in science. Maduabam (2001) noted that students no longer have interest in learning in school but rather just to obtain certificate. This is because of over emphasis on paper qualification. It is important to stimulate students' interest in learning, both academic and vocational contents of the curriculum that can be relevant after school should be emphasized.

Conclusion and Recommendations

Locus of control and interest in schooling have both relative and combined significant influence on students' (hearing and deaf) achievement in science. The importance of these two independent variables in enhancing science achievement among hearing and deaf students cannot be overemphasized. It is however not cheery to note that deaf students performed significantly lower than their hearing counterparts in science, have less interest in school and also have less internal locus of control. In order to enhance science achievement among the deaf students, it is importance to put in place environment that will stimulate their interest in schooling. The need for counseling services especially for the deaf students cannot be overemphasized, interpreters, should be provided for them. They should also have facilities such books and other instructional materials that will assist them to learn. For both deaf and hearing students, laboratory school should be well equipped for meaningful science activities with qualified teacher in charge. This is necessary because though hearing students performed significantly better in science, the achievement level of the students is generally below average.

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