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Comparative Study Of Influence Of Introversion/Extraversion Personality Traits On Secondary School Biology Students' Achievement In Niger State, Nigeria

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ABSTRACT
The study was on the influence of introverted/extroverted personality traits on academic achievement of Biology students in Chanchaga Local Government Area of Niger State. A survey research design was employed to investigate influence of introverted/ extraverted personality traits on academic achievement of secondary schools Biology students, the population of the study was 7550 SSII Biology students. A sample size of 365 students 184 males (40%) and 217 females (60%) were selected using Hat and Draw random sampling techniques, two instruments were employed in the study; (a) The researcher made Personality Inventory (RMPI) and (b) First Term Biology Examinations Scores (FTBES). The validity of the instruments was Conscientiousness = 0.88 and Neuroticism=0.88, (RMPI). Two research questions were asked and two hypotheses formulated and tested at 0.05 level of significance using Product moment correlation coefficient. The findings of the study reveals that; extraverted traits with Biology achievement score of - 0.74 and P-value= 0.00, and introverted with Biology achievement score of 0.17 and P-Value=0.0008 The findings of the study revealed that there is a strong relationship between extraverted and introverted personality traits and academic achievements of Biology students. Two recommendations were made, among which is that Biology teachers in collaboration with the school management should identify and select students with extraverted personality traits for appropriate referrals to school counselors and other relevant therapists in order to help them improve their academic achievement.
Keywords: Introverts, Extroverts, Personality, Academic achievement, and Biology

INTRODUCTION

Different levels of academic achievements among students in a classroom can be caused by factors like cognitive ability, interest, teaching methods, personality traits, learning styles among other factors. Dunn and Reckinger (1981) stated that people differ in their preferences for ways to learn, measuring individual differences and matching or mismatching preferences with instructional strategies can affect learning with a corresponding effect on academic achievement. Wheeler, 2001; Wolk and Nikolai, (1997) also reported that individual personality type and learning style affect learning which in turn influence academic achievement of learners. Personality type and learning style may therefore affect how a student would respond and learn under different educational settings. Different students tend to have different learning styles, while some prefer cooperative learning, others do better when employing individualized learning strategies. According to Komarraju, Karau, Schmeck, and Alen (2011). There are some evidences that individual's personality trait influences his/her learning style and academic achievement. Personality trait is the sum total of the behavioural and mental characteristics that are distinctive of an individual (Colamn, 2009). It refers to individuals' unique and relatively stable patterns of behaviour, thoughts and feelings (Baron, 2006 in Nkok 2023). There are diverse personality traits which account for different behavioural patterns of individuals

resulting to different learning styles. Psychologist Eysenck (2016) have categorized these traits into extravert, introvert and embiverts. **Extraversion or Extroversion** is regarded as a general tendency toward sociability, assertiveness, activeness and being talkative. Smith (2017) analysed that, Extraversion is the degree to which a person is sociable, leader like and assertive as opposed to withdrawn, quiet and reserved. Extraversion (or extroversion) is characterized by excitability, sociability, talkativeness, assertiveness, and high amounts of emotional expressiveness. Goldberg, (2011), McCrae and Costa, (2017) also asserted that people who are high in extraversion are outgoing and tend to gain energy in social situations. Being around other people help them feel energized and excited, enjoy being the centre of attention whereas people who are high in this trait like to start conversations, enjoy meeting new people have wide social circle of friends and acquaintances, find it easy to make new friends, feels energized when around other people, say things before thinking about them. People who are low in extraversion (or introverted) tend to be more reserved and have less energy to expend in social settings. Social events can feel draining and introverts often require a period of solitude and quiet in order to "recharge." Prefers solitude, feels exhausted when having to socialize a lot, finds it difficult to start conversations, dislikes making small talk, carefully thinks things through before speaking and dislike being the center of attention. Goldberg (2015), McCrae and Costa (2017).

According to Eysenck, extraverts tend to seek interaction with others, novel experiences and varied and intense stimuli while Costa and McCrae (2017) asserted that extroverts are gregarious, assertive, activity and excitement-seeking. Mount and Barrick (2015) mentioned that extraversion is most often described as the degree to which an individual is sociable, gregarious, talkative, assertive, adventurous, active, energetic and ambitious. Based on Watson and Clark (2017), extroverts have been found to be socially engaging, gregarious, assertive, expressive, articulate, comfortable in group settings and have a great number of friends. They express their feelings openly, mix up freely and can easily cope and contribute in cooperative learning which is the recommended teaching strategy of Biology (NPE, 2013). Introverts in the other hand prefer their own company and the familiar to unfamiliar. They are described as people who share characteristics such as shyness, social withdrawal, and tendency to talk less. Because of these characteristics these people appear to be self- centred, unable to adjust easily in social situations. They cannot be assumed, future oriented, very sensible and rigid in ideas. They don't make friends easily and do not like social settings, prefer individualized learning strategies as they have difficulties to learn in a group or interact during practical lesson which is a prominent part of learning science subjects like Biology. The best prescribed method of learning Biology according to National policy on education (NPE, 2018) is through group learning and problem-solving method. An extraverted person would always want to work in the group, air his or her views, and take responsibility of his or her own learning which might influence the understanding of the concept learnt (Nkok 2021).

Only few people are pure introverts or pure extraverts while remaining majority of people possess both the qualities of introverts and extraverts. Such people are known as Ambiverts. These extraverted/introverted personality traits may influence students' learning styles and academic achievement particularly in science subjects like Biology which involves a lot of activities and learners' social interactions during the learning process. The appropriateness of students' learning styles and personality traits are determined through academic achievements. In secondary schools, academic achievement is the extent to which students have achieved their short or long-term educational goals which is commonly measured through examinations and continuous assessments. Students with higher scores in examinations and continuous assessments are often considered as high academic achievers while those with lower scores have low academic achievement. (Ward, Stoker, & Murray-Ward 2016). In higher institutions, students' academic achievements are defined by reporting of past semester GPA (grade point average) and their expected GPA for the current semester. The grade point average or GPA is now used by most of the tertiary institutions as a convenient summary measure of the academic achievement of their students. The GPA is a better measurement because it provides a greater insight into the relative level of performance of individuals and different group of students. Personality trait has been recognized as a determining factor on how people learn and a great influencer of academic achievements (Lawrence, 1997; Myer 1998). College students tend to prefer learning environments consistent with their own personality type preference. Goldberg (2017) found personality traits to be significantly related to successful job and school performance, both logically

and statistically (Day & Silverman, 2019; Hogan & Hogan, 2019). But most Biology teachers do neglect personality traits and learning styles of individual students while teaching, and this result in some students being left behind in the learning process. Students whose adopted teaching method aligns with their learning styles do have better academic achievement than their counterparts. For a comprehensive and all - encompassing learning process to take place, Biology teachers are enjoined to be versatile in employing innovative and diversified teaching strategies in order to take care of individual differences amounting from diverse personality traits of extraverted and introverted learners in a class room setting. Since Biology is a practical science subject, it involves a lot of students' interactions through group work, laboratory and field experiences. Introverted and extroverted learners may experience different experiences during Biology lessons which may affect their academic achievements. Some students in public secondary schools in Chanchaga Local Government Area of Niger State have high achievements in Biology in their terminal examinations and SSCE, while other students have low achievement in same examinations despite being taught by same teachers in the same learning environments (Niger State Ministry of Education 2021/2022 academic session). This leaves one in doubt about the causes of this variation/poor achievements. There is a noticeable dwindling /poor academic achievement in Biology particularly in Chanchaga Local Government Area of Niger State. "Out of 6,914 students that sat for WAEC in 2022/2023 session 567 (8.11%) had Excellent Grade (A_1 & A_2,),790 (11.42%) had Very Good Grades (B_1 and B_2), 1,375 (19.77%) passed at Credit level (C4 & C6) and1,940 (28.05%) had Pass Grades (D_7 & E_8) while a total of 2,324(33.61%) failed the subject with F_9 Grades" Niger State Ministry of Education (2023). These poor and dwindling achievement is worrisome despite the fact that all the students had similar learning experiences, other factors like personality traits, learning styles, motivations among other factors may be responsible for this variation in academic achievement of Biology students. The study of (Muh'd,2021), found that there is poor performance of Biology students in Chanchaga Local Government of Niger State, implication of this finding is that most students performed below average in SSCE Examination, if this trend is allowed, most students will not pass Biology examination at credit level in external examinations like WAEC, NECO and JAMB and the implication of this is that greater percentage of the students will not be admitted to read science and technology related courses in the higher institutions since Biology is a pre-requisite for admission into any science and technology programme in all higher institutions in Nigeria. The resultant effect of this will be shortage of man power in science and technology related professions in the society. Since science and technology play prominent roles in the society, it therefore became pertinent to investigate Biology students' causes of variation in/poor achievements in Chanchaga local Government area of Niger State, Nigeria.

Objectives of the Study

The main objective of the study is to determine the relationship between personality traits and academic achievement of students in Chanchaga Local Government of Niger State. Specifically, the objectives of the study are to determine:

i. The relationship between extroverted personality trait and Biology achievements of students in Chanchaga Local Government of Niger State.
ii. The relationship between introverted personality trait and Biology achievement of students in Chanchaga Local Government Area of Niger State.

Research Questions

The following research questions guided the study

i. What is the relationship between extroverted personality trait and Biology achievement of students in Chanchaga Local Government Area of Niger State?
ii. What is the relationship between introverted personality trait and Biology achievement of students in Chanchaga Local Government Area of Niger State?

Hypotheses

The following hypotheses were tested at 0.05 level of significance;

HO_1: There is no significant relationship between introverted personality trait and Biology achievement of students in Chanchaga Local Government Area of Niger State

HO_2: There is no significant relationship between extroverted personality trait and Biology achievement of students in Chanchaga Local Government Area of Niger State

METHODOLOGY

This study adopted a survey research design because the design is related to the aim and objective of the study and would enable the researcher to reach the accessible population with ease. According to (Rossi, Anderson &Wright 2013) Survey research design is an effective design which enables a large population to be captured with ease through the application of sampling technique. Therefore, survey design was considered relevant because it provided the opportunity for the researcher to use a sample out of the large population and in-turn generalize the findings on the entire population. The target population of the study consisted of all Biology students in secondary schools in Chanchaga Local Government Area of Niger State. There are seven thousand five hundred and fifty (7550) students, of which 4950 were males (representing 65.5%) and 2600 were females (representing 34.5%). while the accessible population consisted of all SSII Biology students in the Local Government Area which is 3,227of the total population of Biology students in the area 1,895, boys (representing 58.7%) and 1,332 were girls (representing 41.3%) (Source Niger State Ministry of Education 2023). The sample size of the study comprised three hundred and sixty-five (365) students; representing 5% of the population was randomly selected from 5 public senior secondary schools. This sample size was considered adequate to enable the generalization of the findings of the study according to the population table for determining sample size by (Krecie & Morgan 1970 in Baji, Sani Mamman & Ugochukwu 2015)). The instruments for data collection in this study were; The Personality Inventory (RMPTI) and First Term Biology Examinations Scores (FTBES). The Personality Trait Inventory (PTI) b was constructed, dully validated by experts were employed in this study. b. The second instrument in the study was the First Term Biology Examinations Scores (FTBES) of students who responded to the questions in the RMPTI. The results were collected from examination officers of the sampled schools and used as Biology Achievement Test (BAT). Data was analysed using Pearson Product Moment Correlation Coefficient to measure the relationship between introverted extroverted personality traits and academic achievements. The significance of the various statistical analyses was ascertained at 0.05 alpha levels.

PRESENTATION AND ANALYSIS OF DATA

Table 1: Correlation Result Between Extraverted Personality Trait and the Biology Achievement of Students in Chanchaga Local Government Area of Niger State

Item	Achievement	N	df	P-Value	Mean Score	Decision
Extroversion	-0.4921	365	364	0.000	-0.001	Rejected

Table 1 revealed correlation result between the extraverted personality trait and the Biology achievement of students in Chinchaga local government area of Niger state

The p-value of 0.0000 suggests that there is a statistically significant relationship between extraversion and Biology achievement. This means that it is unlikely that the observed relationship between these two variables occurred by chance, and that the null hypothesis (that there is no significant relationship between extraverted personality trait and Biology achievement) was rejected.

HO_4: There is no significant relationship between introverted personality trait and Biology achievement of students in Chinchaga Local Government Area of Niger State

Table 2: Correlation Results of Introverted Personality Traits and Biology Achievement of SSII Biology students of Chanchaga Local Government Area of Niger State

Item	Achievement	N	df	P-Value	Mean Score	Decision
Introversion	0.0784	365	364	0.003	-0.001	rejected

Table 2 showed correlation result of introverted personality trait and the Biology achievement of students in Chinchaga Local Government Area of Niger State The p-value of 0.003 suggests that there is statistically significant relationship between introverted personality trait and Biology achievement.

This means that it is unlikely that the observed relationship between these two variables occurred by chance, and that the null hypothesis which stated that there is no significant relationship between introverted personality trait and Biology achievement was rejected.

DISCUSSIONS OF FINDINGS

The study on Extroverted personality trait and academic achievement showed a negative strong relationship, this would indicate that the negative association between academic success and extroversion could be caused by the tendency of an extroverted students to be more concerned with social activities and hardly have time and the zeal to engage in personal study and that introverts performed better perhaps because of the personal study habits and not spending time in social activities and friends. This finding is in agreement with that of Tomas and Adrian (2020) which stated that extraversion is negatively related to academic achievement. The findings of Asghar, Ali, and Sayed (2020) are also consistent with the present findings as it established the negative relationship between extraversion trait and academic achievement of Physics students. The findings of Saidunnisa, Manjunatha, Hameed, Nadiya and Sreenidhi (2021) are also in line with the present findings as it established that highly unsuccessful students were seen with extraverted personality traits. However, the findings of Muhammed, Basin and Anand (2022) disagree with the present findings which opined that extroverted trait is a positive predictor of academic achievement. Shiksha and Nabin (2021) also disagree with the present findings which asserted that extraverted traits showed significant and positive correlation with academic achievement. The study of Shehu (2022) disagrees with the present study too as it affirmed that extraverted personality trait will help students to keep deadlines and to study harder in order to pass their examinations.

CONCLUSION

The review indicates the prominent role of personality traits with respect to academic achievement. It shows that introverted and extraverted personality traits have relationship with academic achievement; Thus, individuals with introverted and extroverted personality traits exposed to same learning experiences do attain different levels of academic achievements.

RECOMMENDATIONS

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

i. Biology teachers in collaboration with the school management should identify and select students with extraverted personality traits for appropriate referrals to school counselors and other relevant therapists in order to help them improve their academic achievement.
ii. Biology Teachers should always employ individualized teaching methods in teaching students with introverted personality traits so as to help improve their academic achievements

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