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Attribution Style as Correlates of Secondary School Students' Academic Achievement in Biology in Onitsha Education Zone

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Authors' contributions

This work was carried out in collaboration between both authors. Author JNO read and approved the first draft of this study. Author GAE managed the search for literature, designed the study, managed the data analysis Both authors read and approved the final manuscript.

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ABSTRACT

Aims: The study attribution style as correlates of secondary school students' academic achievement in Biology in Onitsha Education Zone.
Study Design: The research adopted the correlation survey design.
Place and Duration of Study: Multi-stage sampling procedure was used to select a sample size of 720 students from 12 co-educational schools from a population of 4241 SS II students in 26 public secondary schools in Onitsha Education Zone.
Methodology: Multi-stage sampling procedure was used to select a sample size of 720 students from 12 co-educational schools from a population of 4241 SS II students in 26 public secondary

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schools in Onitsha Education Zone. The instruments for data collection were an adapted Attribution Style Scale (ASS) and Students Academic Achievement Scores in Biology. These instruments were administered using the direct delivery approach with the help of 12 regular teachers as research assistants from the sampled schools. Research questions 1 and 2 was answered using Pearson Product Moment Correlation Coefficient (r), data relating to the hypotheses 1 and 2 was analyzed using multiple regression analysis.

Results: The findings of the study revealed that a very low negative relationship exists between attribution style and secondary school students' academic achievement in Biology (r = -0.05). A very low positive relationship exists between attribution style and male secondary school students' academic achievement in Biology (r = 0.11). In the same vein, a very low negative relationship exists between attribution style and female secondary school students' academic achievement in Biology (r = -0.09). There was no significant relationship between attribution style and male and female secondary school students' academic achievement in Biology (r = 0.11/-0.09, t=0.21/-1.34, *Pvalue*=0.83/0.81), This study also revealed that the relationship existing between attribution style and secondary school students' academic achievement in Biology is significant. On the contrary, there was no significant relationship between attribution style and male and female secondary school students' academic achievement in Biology (r=-0.05, t=-1.1, *Pvalue*= 0.02).

Conclusion: A very low negative relationship between attribution style and secondary school students' academic achievement in Biology, while a very low positive relationship between attribution style and male secondary school students' academic achievement in Biology.

Keywords: Attribution style; secondary school; students' academic achievement; biology.

1. INTRODUCTION

"Generally, efforts have been made by teachers and educational researchers to improve students' achievement in Biology since the subject remains an important choice to students interested in science related subjects. Some studies have been conducted in this regard; many other research works have been carried out in these areas but there seem not to be any remarkable improvement. This could be because not much has been done to ameliorate factors relating to the students' interest such as the role of attribution style. In most educational systems, student's advancement in knowledge in a particular area of study is predicated on grade performance the students obtain in classes and examinations. One of the indicators of quality education is cognitive achievement of learners which is measured by test and examination scores" [1]. "Failure to achieve good grades has numerous implications for every student especially those in secondary schools. Poor grades undermine the students' opportunity of joining higher institutions of learning, jeopardizes their chance for job placement, and reduces the individual's active participation in nationwide development. In the opinion of [2], the issue of poor academic achievement has resulted in many nations, including Nigeria. More efforts must be made towards improving the quality of education among secondary school students.

According to Ngunu et al. [3], "students' academic achievement is described as the ability to study and remember subject content and be able to communicate such knowledge orally or in written form even in an examination condition. Teachers in secondary schools measure the academic achievements of students with the aim of achieving desired educational goals and objectives. The realization of such objectives is a milestone for any education system; hence if the achievement corresponds to the objectives, the system has justified its existence. In the same vein, students' academic achievement refers to students' performance or attainment in a subject. It also implies the cognitive score. In line with the point earlier mentioned, achievement in teaching/learning process has to do with attainment of a set of objectives of instruction. If a learner accomplishes a task (for example, a biology problem) successfully and attains the specified goal for a particular learning experience, he is said to have achieved".

Academic achievement among secondary school students can be seen as a test for measurement and comparison of skills in various fields of academic study. It could be high or low [4]. "They further stated that achievement is regarded as something good but difficult to attain. Achievement therefore, is defined as the attained ability or degree of competence in school tasks, usually measured by standardized test and expressed in grades or units based on norms

derived from a wide sampling of pupils' achievement. Operationally, academic achievement is the expected outcome from the pedagogical process of Biology subject from students over a period of time which could be excellent, good, average, poor or very poor. Achievement is something which has been accomplished successfully, especially by means of exertion, skill, practice or perseverance. Evidence of low academic achievement has been recorded in recent times. This is as extracted from the WASSCE" [5]. According to [6], "academic achievement means the attained level of students functioning in school task such as shown by school marks. Teachers in secondary schools measure the academic achievements of students with the aim of achieving desired educational goals and objectives".

"Academic achievement is interestingly an important issue and a fundamental premium upon which all teaching and learning activities are measured using some criteria of excellence ranging from good academic achievement, poor academic achievement, and academic failure" [4]. "They further posited that academic achievement has special importance for both the students and the people around them. The concern of improving academic achievement among secondary school students has increased in recent years. However, the reason for this concern can be attributed to the high percentage of low or poor academic achievement recorded in Biology among other core subjects. Nevertheless, this poor academic achievement among students can be attributed to certain psychological and psycho-social variables among which the present study will examine attribution style and self-esteem as they correlate with academic achievement in Biology" [7,8].

Attributional styles can be defined as an individuals' assessment of causes of actions and behaviors [6]. "Attributional style refers to an individual's consistent manner of evaluating the causes or effects of the positive and negative events that transpire in their life. In other words, attributional style could be positive or negative" [6]. "They added that a positive or negative attributional style is one that tends to habitually explain the pleasant or unpleasant events due to a trait of the individual. Indeed, attributional styles manifest in the formal education process. Nonetheless, individuals tend to draw different conclusion about any behaviour displayed via various approaches, which results in attribution styles. Individuals' attribution styles are the various aspects they utilize to infer or explain the reasons of events or outcomes" [9]. Tolanda [10] defines "attribution style as the tendency to consistently assign positive and negative outcomes to a given sort of cause. Operationally, attribution styles refer to the ways in which secondary school students explain the origin of their actions or events. This indicates that people have distinct explanations for what occurs within their surroundings".

Globally, [9] opined that "attribution involves linking events or acts with something that reflects general traits, whereas specific attribution involves associating occurrences with something that reflects unique quality. External attribution is the process of assigning the cause of occurrences around one to external variables, whereas internal attribution is the process of relating events or behaviour to internal elements. Furthermore, internal attribution style refers to how people attribute success to internal elements such as effort and personal skill, whereas external attribution style refers to how people attribute success to external factors such as luck and others' contributions" [9]. Most successful adolescents ascribe their success to internal sources and their failures to external circumstances, according to [9]. Various authors identified various attribution styles. It was divided into three categories by [9], stable versus transient, global versus specific, and internal versus external. Transient links events or things that happen around an individual to something that changes, whereas stable attribution links events or things that happen around an individual to something that does not change. The act of linking actions with the outcome of events could also be hinged on student's self-esteem.

As observed in Onitsha education zone, in spite the considerable research attention focused on attributional styles of individuals, it appears that generally in Nigeria and in Onitsha Education Zone in particular, the comprehensive/broad nature of this construct as well as its relationship with academic achievement is still faced with paucity of empirical investigations. This is further observed in the trend of academic achievement of students in external examinations, especially in subjects like Biology which has shown a fluctuating performance as recorded by the West African Examination Council, WAEC. Based on this unsatisfactory state of affairs, it becomes imperative to examine attribution style as correlates of secondary school students'

academic achievement in Biology in Onitsha Education Zone. In specific terms, this study examined;

1. The relationship between attribution style and secondary school students' academic achievement in Biology.
2. The relationship between attribution style and male and female secondary school students' academic achievement in Biology.

1.1 Research Questions

1. What is the relationship between attribution style and secondary school students' academic achievement in Biology?
2. What is the relationship between attribution style and male and female secondary school students' academic achievement in Biology?

1.2 Null Hypotheses

1. There is no significant relationship between attribution style and secondary school students' academic achievement in Biology.
2. There is no significant relationship between attribution style and male and female secondary school students' academic achievement in Biology.

2. METHODOLOGY

Correlation survey research design was adopted for this study. According to [10], a correlation survey research design seeks to establish relationship between two or more variables as well as predict the relevance of a variable over the other. The population for this study comprised 4241 senior secondary school two (SSII) students from the 26 public secondary schools situated in 3 local government Areas in Onitsha Education Zone. They are distributed thus, Onitsha North – 2650, Onitsha South – 749, Ogbaru – 642 (Source: Anambra State Post Primary School Commission, PPSC, 2023/2024). The sample for this study comprised 720 SS II secondary school students drawn from 12 co-educational secondary schools in Onitsha Education zone. This represents about 17 percent of the entire population. This study adapted the 18 itemed attribution style questionnaire for adolescents by [11], and Students Academic Achievement Scores in Biology.

The validation of the instrument yielded a coefficient alpha for the positive events (CP), negative events (CN), and overall explanatory style score (CPCN) scales. The instrument had gone through face, content and construct validation. Thus, it was formed to be highly acceptable in data collection for attributing success or failure amongst students at various levels in Nigeria. Sogh et al. [12] reported "final coefficients of attribution style questionnaire with the use of Cronbach's alpha method for positive attribution styles as 0.76 and for negative attribution styles as 0.81. Data for this study were collected through direct delivery approach. By this method, copies of the questionnaires were distributed personally to the respondents by the researcher with the help of 12 regular teachers who were used as research assistants". Data relating to research questions 1 and 2 were analyzed using Pearson Product Moment Correlation Coefficient (r), hypotheses 1 and 2 was analyzed using multiple regression analysis. Multiple regression analysis determines the R, R - squared and R2 adjusted. The significant values on the coefficient table were used to test hypotheses. In testing the null hypotheses, where the significant p-value is less than the alpha value, the null hypotheses will be rejected (there is a significant relationship). Otherwise, where the significant p-value is greater than the alpha value 0.05, the null hypotheses will not be rejected (there is no significant relationship).

3. RESULTS AND DISCUSSION

The finding of this study revealed that a very low negative relationship exists between attribution style and secondary school students' academic achievement in Biology. Similarly, a very low positive relationship exists between attribution style and male secondary school students' academic achievement in Biology. In the same vein, a very low negative relationship exists between attribution style and female secondary school students' academic achievement in Biology.

These findings somewhat disagree with [12] who reported that "there is a positive correlation between compatibility factor and academic performance; a positive correlation between personality characteristics and attribution styles. Results of the present research along with intensifying the important role of positive attribution style in academic achievement of students could help us prevent harmful consequences of failure by controlling factors that result in failure".

Table 1. Pearson r results on the relationship between attribution style and secondary school students' academic achievement in Biology

Sources of variation	N	Attribution style r	Biology Academic achievement r	Remark
Attribution style	720	1.00	-0.05	Very low negative relationship
Biology academic achievement	720	-0.05	1.00	

Table 2. Pearson r results on the relationship between attribution style and male and female secondary school students' academic achievement in Biology

	Sources of variation	N	Attribution style r	Biology academic achievement r	Remark
Male	**Attribution style**	476	1.00	0.11	Very low positive relationship
	Biology academic achievement	476	0.11	1.00	
Female	**Attribution style**	244	1.00	-0.09	Very low negative relationship
	Biology academic achievement	244	-0.09	1.00	

Table 3. t-test for correlation summary on the relationship between attribution style and secondary school students' academic achievement in Biology

N	Cal. R	Df	Cal. t	Pvalue	Remark
720	-0.05	718	-1.17	0.02	Significant

Table 4. t-test for correlation summary on the relationship between attribution style and male and female secondary school students' academic achievement in Biology

	N	Cal. r	df	Cal. t	Pvalue	Remark
Male	476	0.11	474	0.21	0.83	Not significant
Female	244	-0.09	242	-1.34	0.18	Not significant

This study also revealed that the relationship existing between attribution style and secondary school students' academic achievement in Biology is significant. On the contrary, there was no significant relationship between attribution style and male and female secondary school students' academic achievement in Biology. The former result reported conforms to the findings of Ngunu et al. [2]. The finding revealed that majority of the students attributed both success and failure to internal, uncontrollable, and unstable attributions. The results indicated that causal attributions were significantly correlated to academic achievement. Taking into account that students can form maladaptive causal-attributions. The study made recommendations to the stakeholders on intervention measures.

4. CONCLUSION

Based on the findings of this study, it was concluded that;

1. A very low negative relationship exists between attribution style and secondary school students' academic achievement in Biology.
2. A very low positive relationship exists between attribution style and male secondary school students' academic achievement in Biology.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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