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INDIVIDUAL PSYCHOLOGICAL CONCEPTS AS CORRELATES OF SECONDARY SCHOOL STUDENTS' PERCEIVED ACADEMIC ACHIEVEMENT IN BIOLOGY IN AWKA EDUCATION ZONE

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ABSTRACT

The study examined individual psychological concepts as correlates of secondary school students' perceived academic achievement in Biology in Awka education zone. The design was correlational research type. The target populations for the study were Biology students of senior secondary II (SS II) classes in Awka education zone in Anambra state, Nigeria. The sample for the study was three hundred and sixteen (300) Biology students (male: 150 and female: 150) drawn through simple random sampling techniques. Two purpose of study, two research questions and two hypotheses were raised to guide the study. The instruments used to elicit the relevant data were two standard instruments. One is individual Psychological Concept Questionnaire IPCQ adopted from "Individual psychological -Concept" as developed by Goñi, in 2000 aim to measure personal perceptions regarding Self-fulfillment (6 items), Honesty (3 items), Autonomy (4 items), Emotional psychological concept (5 items), and General Personal psychological concept (4) and Perceived Academic Achievement Questionnaire (PAAQ) adopted from Liu & Wang in 2005 consisted of two 10-item subscales: students' academic confidence (11 items) and students' academic effort (10 items). The data collected were analysed using Pearson's Product Moment Correlation for research questions while hypotheses were tested at .05 level of significance using regression ANOVA. The results revealed that: a moderate positive relationship between students' individual psychological concepts and their perceived academic achievement in Biology. Hence, there is a significant relationship between students' individual psychological concept and their perceived academic achievement in Biology. The finding also revealed a low positive relationship between students' individual psychological concepts and their perceived academic achievement in Biology as moderated by gender. Hence, there is a significant relationship between students' individual psychological concepts and their perceived academic achievement in Biology as moderated by gender in favour of male. From the findings it was concluded among others that different individual students have individual psychological concept in varying qualities as suggested by the term "negative and positive" individual psychological concept and varying quantities as implied by "low and high" individual psychological concept in achievement in Biology subject. From the conclusion it was recommended that parents, guardians, teachers, government and not governmental organization should imbibe the culture of encouraging and strengthening the individual psychological concept of children/students rather than condemning and criticizing them with abusive statements that will make them feel inadequate, incompetent, and inferior; this would help in developing positive and high individual psychological concept that can aid their academic achievement.

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Introduction

Natural Science is a branch of science concerned with the description, prediction and understanding of natural phenomena, based on empirical evidence from observation and experimentations (Heilbron, 2013). Without knowing natural science, it is difficult to fully understand the study of the physical world. More so, natural science is any of the sciences such as Physics, Chemistry, or Biology that deal with matter, energy, and their interrelations and transformations or with objectively measurable phenomena (Wilson, 2018). It is the empirical sciences that explains or predicts natural phenomena. Due to the present study Biology was focused.

Biology is a branch of natural science that deals with the study of living organisms, structures, functions, evolutions, distribution and interrelationships. Arsal (2019) opined that the word living (life) makes Biology to have so much importance to humanity. Importance of Biology to humanity includes studying about life. Secondly it provides an in-depth, scientific understanding of how all living and nonliving organisms interact with each other. Third, it gives insights into how diverse life forms are. That is the more reasons why secondary school students in Nigeria are mandated to register it in all secondary school senior certificate examination (Arsal, 2019). In spite the importance of Biology to humanity and national development, the achievement of secondary school students in West African Examination Council conducted examination is still below average. Report from the Chief Examiner's record showed that the raw mean score of the 667,412 students who registered for Biology was 43.0 with a standard deviation of 15.36 for 2018. In the 2019 examination, their raw mean score was 36.0 and standard deviation of 15.62 in 2020 the raw mean score was 41.1 and standard deviation is 14.99. in 2021 the raw mean score was 40.2 and standard deviation of 15.1 and in 2022 the raw mean score was 39.9 and standard deviation scores of 15.20, from the record it could be noticed that 2018-2022, the students' mean score in Biology in these years were below 50% indicating a poor achievement in the subject. Most researchers believed that this poor academic achievement in Biology could be as a result of issues like mental health and students' individual psychological concept.

Individual psychological concepts also known as self-concept is a hypothetical construct that help explain and predict an individual's achievement. It includes elements of reciprocity, where an individual's actions influence their psychological perceptions and perceptions of self, in turn, influence their actions (Obidigbo, 2020). Individual psychological concept is the cognitive or thinking aspect of self that is self-image related Asanbe et. al. (2018). It is also the totality of a complex, organized and dynamic system of learned beliefs, attitudes and opinions that each person holds to be true about his or her personal existence. Psychological concept has significant effect on adjustment and positive mental health. Therefore, very important personality constructs develop and grow out of life experiences (Obidigbo, 2020). Some studies found that individuals

with poor psychological concept had less satisfactory relationships, more negative attitudes toward illness and more maladaptive coping behaviors (Hughes, 2014). Therefore, students who have positive psychological concept will tend to possess a higher social and emotional compatibility (Fayombo, 2021) which will make them have the potentiality to make better progress and good academic achievement.

In the study conducted by Ellah and Achor (2017) to determine the relationship between students' achievement in Basic Science and Technology (BST) and their performance in senior secondary science subjects in Benue state, the researchers observed that there is a low percentage variation in students' achievement in science that can be attributed to their perceived academic achievement in Basic Science and Technology, there still exist significant relationship between students' psychological concepts in Basic Science and Technology and their achievement in science. The findings therefore imply that perceived academic achievement in Basic Science and Technology is a major factor in science students' performance in science subjects at senior secondary level. Similarly, Enemarie et.al.(2018) who investigated on students' perceived achievement in Basic Science in Basic Education Certificate Examination (BECE) is a predictor of their achievement in Biology in Senior Secondary Certificate Examination (SSCE) revealed that students' achievement in Basic Science in BECE is a moderate predictor of their achievement in Biology in SSCE (β = 17.5%). The results also showed that the achievement of male students in Basic Science in BECE significantly predicts their performance in Biology in SSCE (β = 19.8%). The researchers also found that the achievement of female students in Basic Science in BECE significantly predicts their achievement in Biology in SSCE (β = 15.8%). Meanwhile Eccles and Wigfield (2012) reported a moderate relationship in high students' individual psychological concept and academic achievement but did not find a significant relationship between high school junior students' psychological concept and their academic achievement in science Psychological-Worth Theory (PWT) in Glasgow.

More so, Kobal and Musek (2021) observed a moderate relationship in students' individual psychological concept and academic achievement of kindergarten children in two countries of Slovenia and France in early child learning. The authors further observed a moderate relationship in male and female relationship in individual psychological concept and their early child academic learning by so doing there is no significant difference relationship between male and female students' individual psychological concept and academic achievement of kindergarten students in the two countries of Slovenia and France.

In contrary development, a large body of literature has also reported the relationship between gender, individual psychological concept and academic achievement Ogbeba et. al. (2019), Ajmal and Rafique (2018) reported that boys seem to have a more positive relationship in their individual psychological concept and academic achievement in a number of dimensions such as Basic science and Psychology courses than girls. In a relative manner, Oluwatosin and Bamidele (2014) reported differences in the strength of relationship between individual psychological concept and academic

achievement in Chemistry seems to be stronger for boys. Further, in a study to find the influence of psychological concept on perceive academic achievement among students of College of Education, Akwanga, Nasarawa State-Nigeria Nalah (2014) found that boys showed significantly have high academic achievement in college courses than the girls. Meanwhile, researchers working in the area of gender issues have not resolved the long-smoldering debate on gender difference in individual psychological concepts. For example, Wondu (2018) reported that despite comparable academic preparation and within classroom psychological concept, males continue to outperform females at the elementary, middle and high school levels on standardised tools measuring Basic science subject whereas, Arsal (2019) reported that females' complete comparable levels of Biology academic achievement classwork than their male counterpart.

Following the reports of students under 50 mean average as earlier cited from WAEC Chief Examiners' report from 2018-2022 one could be wondering that one of the contributing factors that may course such thing could be students individual psychological concept as asserted by researchers and more so, from the foregoing, it appears the question of whether relationship exists or does not exist between individual psychological concept and academic achievement in Biology and some related subject like Basic science has not been concisely answered because both the theoretical and empirical studies reviewed in this study have produced diverse and contradictory results. Similarly, the issue of gender difference in individual psychological concept in Biology as not been resolved and therefore subject to further investigation especially in Anambra state. To provide a clear answer to these controversies this study investigated on individual psychological concepts as correlates of secondary school students' perceived academic achievement in Biology in Awka education zone in Anambra state.

Purpose of the Study

The main purpose of this study is to determine the individual psychological concepts as correlates of secondary school students' perceived academic achievement in Biology in Awka Education Zone. Specifically, the study sought to:

1. To determine the relationship between students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone.
2. To determine the relationship between male and female students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone

Research Questions

The following research questions guided the study

1. What is the relationship between students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone?
2. What is the relationship between male and female students' individual psychological concepts and their perceived academic achievement in Biology in Awka Education Zone?

Research Hypotheses

HO₁: There is no significant relationship between students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone.

HO₂: There is no significant relationship between male and female students' individual psychological concepts and their perceived academic achievement in Biology in Awka Education Zone.

Research Method

The study employed a correlation research design. This design according to seeks to establish the relationship that exists between two or more variables. The area of the study was Awka education zone. The population of the study comprised of all the 2070 Senior Secondary two (SSII) Biology students in the 18 State owned co-educational secondary schools in the zone. Simple random sampling was used to draw 300 students (150 female and 150 male) from the total population using standard table of Yamame, sample size of 0.2% of total population.

Data was collected using two kinds of instruments. The first instrument was 22-item Likert-type inventory questionnaire known as Individual Psychological Concept Questionnaire IPCQ. The standard instrument "Individual psychological - Concept" was adopted as developed by Goñi, A. in 2000 aim to measure personal perceptions regarding Self-fulfillment (6 items), Honesty (3 items), Autonomy (4 items), Emotional psychological concept (5 items), and General Personal psychological concept (4). The questionnaire is a Liker scale with five response options ranging from strongly disagree to strongly agree. The second instrument is the Perceived Academic Achievement Questionnaire (PAAQ) adopted from Liu & Wang in 2005. The PAAQ consisted of two 10-item subscales: students' academic confidence (11 items) and students' academic effort (10 items). Its option responses were "Very high extent", "High extent", "Very low extent", "Low extent". These instruments are standardized one and were adopted by the researchers. Pearson product moment correlation was used to answer research questions.

Ranges of scores	**Decision**
±0.80 – ± 1.00	High positive or negative relationships
±0.31 – ± 0.79	Moderate positive or negative relationship
±0.00 – ± 0.30	Low positive or negative relationship.

Regression ANOVA analysis was used to test the significant relationship at .05 the decision rule is that when p-value is less than or equal to .05 ($p<.05$) the hypothesis was reject but when it is the other way round it is accepted.

Presentation of Results

Research Question 1: What is the relationship between students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone?

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Table 1: Pearson's Product Moment Correlation Analysis of students' Individual Psychological Concepts and their academic achievement in Biology.

Variable	Mean	SD	N	r	R^2
IPC	59.47	7.32	300	0.73	0.54
Academic achievement	57.63	8.32			

R^2 = coefficient of determination

Result on Table 1 is correlation coefficients of analysis of students' individual psychological concept IPC and their perceived academic achievement in Biology. Results showed that the correlation between students' IPC and their academic achievement in Biology was 0.73. This means there was a high positive relationship between students' IPC and their perceived academic achievement in Biology. The coefficient of determination associated with 0.73 is 0.54. The coefficient of determination (0.73) also known as the predictive value means that 54% of students' IPC accounted for the variation in perceived academic achievement in Biology. This is an indication that 46% of variation in perceive academic achievement in Biology of students is attributed to other factors other than IPC.

Research Question 2: What is the relationship between male and female students' individual psychological concepts and their perceived academic achievement in Biology in Awka Education Zone?

Table 2: Pearson's Product Moment Correlation Analysis of Male and Female Students' Individual Psychological Concepts and their perceived academic achievement in Biology.

Variable	Mean	SD	N	r	R^2
IPC	59.47	7.32	300	0.13	0.9
Gender	1.60	.49			

R^2 = coefficient of determination

Result on Table 2 is correlation coefficients of analysis of students' individual psychological concept IPC and their perceived academic achievement in Biology. Results showed that the correlation between male and female students' IPC and their academic achievement in Biology was 0.13. This means there was a high positive relationship between students' IPC and their perceived academic achievement in Basic. The coefficient of determination associated with 0.13 is 0.9. The coefficient of determination (0.13) also known as the predictive value means that 9% of male and female students' IPC accounted for the variation in perceived academic achievement in Biology. This is an indication that 91% of variation in perceive academic achievement

in Biology of male and female students is attributed to other factors other than IPC.

Hypotheses

HO₁: There is no significant relationship between students' individual psychological concepts and their perceived academic achievement in Biology in Awka education zone.

Table 4: **Regression Analysis of the differences relationship between students' individual psychological concept IPC and their perceived academic achievement in Biology**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	11178.996	1	874.053	64.031	.000
Residual	9554.670	298	13.650		
Total	20733.667	299			

In testing hypothesis 1, regression analysis was used. The result in Table 3 shows that an F-ratio of 64.031 with associated exact probability value of .000 was obtained. This exact probability value of .000 was less than .05 level of significance set as bench mark and it was found to be significant. The null hypothesis which stated that there is no significant relationship between students' individual psychological concept and their perceived academic achievement in Biology was therefore rejected.

HO₂: There is no significant relationship between male and female students' individual psychological concepts and their perceived academic achievement in Biology in Awka Education Zone.

Table 4: **Regression Analysis of the differences relationship between male and female students' individual psychological concept IPC and their perceived academic achievement in Biology**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4125.536	1	4125.536	105.118	.000
Residual	4631.130	298	39.247		
Total	8756.667	299			

α=0.05

In testing hypothesis 2, regression analysis was used. The result in table 4 shows that and F ratio of 105.118 with associated exact probability value of .000 was obtained. This exact probability value of.000 was less than .05 level of significance set as bench mark and it was found to be significant. This null hypothesis which stated that there is no significant relationship between male and female students' academic achievement in Biology in Awka Education zone was therefore rejected.

Discussion of Findings

The result on table 1 is correlation coefficients analysis of students' individual psychological concept IPC and their perceived academic achievement in Biology. The result shows a moderate positive relationship between students' individual psychological concepts and their perceived academic achievement in Biology. Hence, there is a significant relationship between students' individual psychological concept and their perceived academic achievement in Biology as indicated in table 3. This finding portrays that students' individual psychological concepts play an important role to affect students' perceived academic achievement in Biology. The findings are in consonance with Fayombo (2021), Kobal and Musek (2021) whom in their different studies observed a moderate positive relationship between school children individual psychological concepts and their perceived academic achievement. Also the finding is in line with Enemarie et.al.(2018) who investigated on students' perceived achievement in Basic Science in Basic Education Certificate Examination (BECE) is a predictor of their achievement in Biology in Senior Secondary Certificate Examination (SSCE) who revealed that students' achievement in Basic Science in BECE is a moderate predictor of their achievement in Biology in SSCE (β = 17.5%).

More so the finding of the study supports the findings of other previous researchers such as Ellah and Achor (2017) who found that there exists a significant relationship between students' individual psychological concept and students' achievement in science. In contrary, the finding is not in line with Eccles and Wigfield (2012) who reported that there is no a significant relationship between high school junior students' psychological concept and their academic achievement in science Psychological-Worth Theory (PWT) in Glasgow. By virtue of this finding, this study has joined the school of thought that relates students' individual psychological concept and their perceived academic achievement.

The result on table 2 is correlation coefficient analysis of students' individual psychological concepts and their perceived academic achievement in Biology as moderated by gender. The result shows a low positive relationship between students' individual psychological concepts and their perceived academic achievement in Biology as moderated by gender. Hence, there is a significant relationship between students' individual psychological concepts and their perceived academic achievement in Biology as moderated by gender in favour of male. This finding portrays that male and female secondary school students' individual psychological concepts play an important role to affect their perceived academic achievement in Biology. The finding is in line with a large body of literature Ogbeba et. al. (2019), Ajmal and Rafique (2018), Oluwatosin and Bamidele (2014) whom in their different studies reported the relationship between individual psychological concept and academic achievement as moderated by gender.

More so, the finding of the study supported that of Nalah (2014) found that boys showed significantly have high academic achievement in college courses than the girls but the finding is not in line

with Wondu (2018) and Arsal (2019) who discovered a significant different in relationship between psychological concepts and academic achievement as moderated by gender in favour of female students in separate studies. By virtue of this finding, this study has joined the school of thought that relates students' individual psychological concept and their perceived academic achievement in Biology as moderated by gender.

Conclusion

The study examined the individual psychological concepts as correlates of secondary school students' academic performance in Biology in Awka Education Zone. From the research findings, there is a moderate positive and significant relationship between students' individual psychological concept and their perceived academic achievement in Biology. There was also a low positive relationship between students' IPC and their perceived academic achievement in Biology as moderated by gender. This could have also resulted to the significant difference in relationship between students' IPC and their perceived academic achievement in Biology as moderated by gender. This justifies that different individual students have individual psychological concept in varying qualities as suggested by the term "negative and positive" individual psychological concept and varying quantities as implied by "low and high" individual psychological concept in achievement in Biology subject.

Recommendations

Based on the findings of the study, it was recommended that:

That parents and guardians should imbibe the culture of encouraging and strengthening the individual psychological concept of their children rather, than condemning and criticizing the child with abusive statements that will make them feel inadequate, incompetent, and inferior; this would help in developing positive and high individual psychological concept and academic achievement among them.

The teachers and the school management need to design an orientation exercise in form of paper presentation, seminar, or symposium in order to sensitize and enlighten the students on how to build their individual psychological concept towards enhancing their academic achievement. This will no doubt remove the inferiority complex (low individual psychological concept, which is synonymous to low academic performance of the students.

Finally, the government and non-governmental agencies also have some roles to play. These organizations should encourage the provision of practical instructional materials, funds for educational visits as well as employ more qualified teachers with professional training and expertise to teach the students and to indulge them on practical academic exercise that would increase students level of confidence and boost their psychological concept toward subject to be learn. This will help to increase students' academic achievement in science more especially in Biology subject.

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