ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

SELF-CONCEPT AS CORRELATES OF INTEREST AND ACADEMIC PERFORMANCE IN PHYSICS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN KOGI STATE

[1]FASANYA Ayodele Gabriel, [2]ABDULWAHEED Opeyemi Ibrahim,
[3]ADEWUMI Gabriel Segun, [4]ARIVI Saliu Sadiq
[1,2,3&4] Department of Science Education, Faculty of Education
Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria
fasanya798@gmail.com : fasanya@ksu.edu.ng
Tel: +2348036524713

Abstract
Self-concept plays a vital role in shaping students' interest and academic performance, particularly in subject like Physics that requires critical thinking and problem-solving skills. The study therefore, examined the relationship between self-concept, interest and academic performance in Physics among secondary school students. This was with the purpose of understanding the relationship as well as determine the predictive strength of the predictor variable on the students' interest and performance in physics. To achieve this goal, three research questions and two hypotheses guided the study, which adopted a correlational research design. The population for the study comprised 2,264 students who were offering physics in all the public secondary schools in Dekina Local Government Area of Kogi State. Three schools were selected using simple random sampling technique and all the 200 students who were offering Physics in the three selected schools served as sample size (intact classes) for the study. The instruments for data collection were 25-item psychological Physics Self-Concept Rating Scale (PSCRS), 25-item Physics Interest Rating Scale (PIRS) and 25-item multiple choice standardized Physics Performance Test (PPT), which were developed by the researchers and validated by experts. The construct validity of PSCRS and PIRS were established through group difference method and their reliability coefficients were 0.68 and 0.71 respectively. The reliability coefficient of PPT using Kuder Richardson 20 formula was 0.79. Data were analyzed using inferential statistics. The results showed that self-concept in physics was a significant predictor of interest and academic performance of students in the subject. It was therefore recommended among others that school administrators and teachers should work out strategies that would improve students' self-concept, interest and academic performance in Physics.
Keywords: Self-concept, interest, academic performance, physics.

Introduction

Self-concept plays a vital role in shaping students' interest and academic performance, particularly in subject like Physics that requires critical thinking and

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

problem-solving skills. Academic performance of students in physics is a construct which can be influenced by various factors such as self-concept, motivation and interest. It is a crucial concern for educators and researchers as it has significant implications for students' future career prospects and scientific literacy (Kadir et al., 2020). Researches have consistently shown that students' self-concept plays a pivotal role in shaping their academic performance in science subjects (Oche, 2024; Liu et al., 2019; Imo & Kefas, 2016). The study of Physics has become a basic necessity for proper understanding of the world around us. Physics opens new frontiers to many fields such as medicine, pharmacy, engineering, geology among others thereby contributing significantly in technological advancement. In recognition of this, there is the need for educators and researchers to come up with strategies that would improve students' interest and performance in Physics as Mahanta (2014) indicates that students are getting disinterested in Physics. In view of this, government and relevant agencies in Nigeria have invested a lot of human and material resources so as to boost and sustain science education (Imo & Kefas, 2016). In spite of these efforts, studies showed that some secondary school students have low interest in Physics (Akubor, 2024; Adeyemi & Achimugu, 2024). This low interest may lead to poor performance. Against this backdrop, there is need for further investigation of students' interest in studying physics in order to identify the mediating variable and work out strategies of attracting students into pursuing of Physics related careers.

Self-concept, a crucial psychological construct plays a significant role in shaping students interest and performance in Physics. Self-concept according to Pajares (2020)

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

refers to students' perception of their abilities, attitudes and values in relation to Physics. Oche (2024) opine that self-concept implies the set of knowledge and attributes that a person has about himself or herself. It is also the perception an individual assigns to himself or herself, the characteristics or attributes that a person uses to describe himself or herself. Therefore, self-concept is seen as all the information and belief individuals have about their own characteristics and themselves. This implies that self-concept refers to domain specific evaluations of self. Based on this, students can make self-evaluations in many domains of their life. These domains include academic, athletics, physical appearance, social interaction, moral, temperamental, intellectual, among others (Nagar & Nagar, 2020).

Studies have shown that self-concept is a significant predictor of students' interest and their academic performance in Physics. A study by Kadir et al. (2020) revealed a significant positive correlation between self-concept in Physics and their academic performance in the subject. Similarly, a study by Liu et al. (2019) found that students with positive self-concept in Physics tend to have higher interest and motivation in Physics. In another related study, Simpson and Oliver (2021) found out that students' self-concept in Physics influences their interest and motivation to learn Physics and Physics related disciplines. Similarly, Osborn et al. (2019), Kaya and Lundholm (2020) found out a significant positive correlation between interest and academic performance in Physics. This provides evidence that interest in Physics is a significant predictor of academic performance in the subject.

In consonance with the foregoing, self-concept plays a significant role in

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

determine the interest and academic performance in Physics. Self-concept or self-perception is a trait that tells an individual's perception of self in relation to different characteristics (Onuka & Ogbebor, 2014). Academic self-concept is the way an individual thinks, feels, acts and evaluate himself/herself (Imo & Kefas, 2016). Hence, in this study, the proposition is that a student who has positive academic self-concept about himself/herself in Physics, no matter how the teaching method and other factors are, will still have high interest in the subject.

From the fore-going, it shows that students and their academic performance can be clearly understood in relation with self-concept. However, not many studies have given due consideration to the effectiveness of self-concept as it relates to students' interest and their academic performance in Physics in a single study. Hence the unresolved issue which formed the problem of this study is to investigate the effect as well as the nature of relationship that exist between self-concept, interest and academic performance in Physics among secondary students.

Research Questions

The following research questions were generated to guide the study.

1. What is the level of SS2 students' interest in Physics?
2. What is the nature of SS2 students' self-concept in Physics?
3. What is the level of SS2 students' academic performance in Physics?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant correlation between the SS2 students' self-concept and

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

interest in Physics.

2. There is no significant correlation between the SS2 students' self-concept and academic performance in Physics.

3. There is no significant correlation among SS2 students' self-concept, interest and academic performance in Physics.

Methodology

The study adopted correlational research design. Correlational research design was considered appropriate for the study because it indicates the degree and level or direction of relationship between two or more variables and these were what the study sought to do. The population for the study comprised 2,624 Senior Secondary Students two (SS2) who were offering Physics in all the public secondary schools in Dekina Local Government area of Kogi State, Nigeria. Three public secondary schools were selected using simple random sampling technique. 200 SS2 students who are offering Physics in the three selected schools during the 2023/2024 academic session formed the sample size (intact classes) for the study.

Three instruments were used for the collection of data. They are: Physics Self-Concept Rating Scale (PSCRS), Physics Interest Inventory Rating Scale (PIIRS) and Physics Performance Test (PPT). Physics Self-Concept Rating Scale consisted of 25-item structured questionnaire to measure students' self-concept in Physics. Physics Interest Inventory Rating Scale similarly consisted of 25-item structured questionnaire designed to measure students' interest in Physics. The Physics Performance Test consisted of 25 multiple-choice items with options A-D drawn from standardized

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

Physics questions to measures students' academic performance in Physics. The items in PSCRS and PIIRS sought information on the variables under investigation. Likert scale of Strongly Agree (SA) Agree (A) Disagree (D) and Strongly Disagree (SD) was used and scored 4, 3, 2, and 1 respectively for positive statements. The total score for PSCRS was 100% and PIIRS was similarly 100%. Negatively-worded items were scored by reversing the scale. Each item of PPT was scored 4 marks, giving it a total score of 100%.

The PSCRS, PIIRS and PPT were carefully developed by the researchers after reviewing relevant literature. Two experts in Test and Measurements and Psychology assessed the contents of PSCRS, PIIRS and PPT and judged their adequacy. The items were then tried out on 40 SS2 students in a school which was not part of the selected schools but has the same characteristics as the selected schools. The responses were scored and the scores were used to separate the students into two groups. Those who scored high in Physics self-concept but low in interest and performance were in one group. Those who scored low in self-concept but high in interest and performance were in another. Then the group difference method was used to establish the construct validity of the items of the instruments. Cronbach Alpha method was used to determine the internal consistency reliability coefficient of PSCRS and PIIRS, while Kuder Richardson 20 formula was used to determine the internal consistency reliability coefficient of PPT. The reliability coefficients of PSCRS, PIIRS and PPT were 0.68, 0.71 and 0.79 respectively.

After established the reliability coefficients of the instruments, copies of PSCRS

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

and PIIRS were distributed to the participants through their physics teachers who served as research assistants in the selected schools. One week after the distribution of PSCRS and PIIRS, the Physics performance test was conducted on the participants. Their responses were scored and categorized as follows: Scores from 4 -28 on self-concept in physics were assigned low, 32-56, moderate and 60-100 high. Similarly, the same ranges of scores were used to indicate low, moderate and high on interest and academic performance. The research questions were answered using mean, standard deviations and percentages. The hypotheses were tested at 0.05 level of significance using Pearson Product Moment correlation and Multiple Regression Analysis (MRA).

Results

Research Question 1: What is the direction of SS2 students' interest in Physics?

Table 1: **Analysis of SS2 Students' Scores on Interest in Physics**

Scores	N	%	Direction of Interest
4-28	52	26	Low
32-56	60	30	Moderate
60-100	88	44	High

Table 1 revealed that majority of the students (44%) had high interest in Physics.

Research Question 2: What is the nature of SS2 students' self-concept in Physics?

Table 2: Analysis of SS2 Students' Scores on Self-Concept in Physics

Scores	N	%	Nature of Students' Self-Concept
4-28	50	25	Low
32-56	56	28	Moderate
60-100	94	47	High

Table 2 showed that majority of students (47%) had high self-concept as far as Physics is concerned. Only few had low level of self-concept.

Research Question 3: What is the level of SS2 students' academic performance in Physics?

Table 3: Analysis of the Level of Students' Academic Performance

Scores	N	%	Level of Students' Performance
4-28	42	21	Low
32-56	62	31	Moderate
60-100	96	48	High

Table 3 indicated that a good number of students (48%) had high performance in

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

Physics.

Hypothesis 1: There is no significant correlation between the SS2 students' self-concept and interest in Physics.

Table 4: Analysis of Correlation between Students' Self-Concept and Interest

Variable	Mean	StD	Df	R	P	Decision
Self-Concept	42.33	2.98				
			198	0.561	0.000	Rejected
Interest	38.64	3.21				

Table 4 revealed a moderate and positive relationship between students' self-concept and interest in Physics.

Hypothesis 2: There is no significant correlation between the SS2 students' self-concept and academic performance in Physics.

Table 5: Analysis of Correlation between Students' Self-Concept and Academic Performance

Variable	Mean	StD	Df	R	p	Decision
Self-Concept	42.33	2.98				
			198	0.722	0.000	Rejected
Performance	46.09	2. 06				

Table 5 indicated a strong and positive relationship between students' self-concept and performance in Physics.

Hypothesis 3: There is no significant correlation among SS2 students' self-concept, interest and academic performance in Physics.

Table 6: Regression Analysis Revealing the Combined Effect of Predictor Variable

Predictor	R	R^2	Adjusted R^2	F-Ratio	Beta	t	Sig
Combined Effect	.448	.198	.177	16.02			
Self-Concept					0.17	3.68	.000
Interest					0.13	1.74	.053
Performance					0.21	3.25	.030

Table 6 showed that combined effect of the predictor variable on interest and academic performance in Physics was significant ($F = 16.02$, $P < 0.05$). The predictor variable accounted for 19.8% of the total variation on students' interest and performance as self-

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

concept being the highest predictor, followed by performance, while interest was the least predictor. This means that the independent variable explained 19.8% of the variation in the dependent variables.

Discussion of Findings

The findings of the study revealed that majority of the students had positive interest in Physics. This finding is in agreement with the studies of Kaya and Lundholm (2020), Osborn et al (2019) that students still have favourable interest in physics. This may further explain the students positive interest in Physics measured in the study. However, the finding did not support that of Akubor (2024) and Mahanta (2014) which indicated that there was a growing disinterest in Physics among secondary school students.

The findings also showed that a number of students (94) which represents (48%) of the students demonstrated high academic self-concept in physics, thus supporting the findings of Simpson and Oliver (2021) and Kadir et al. (2020) that students self-concept had a positive relationship between students' interest in Physics. Hence going by the position of Marsh et al. (2017), Tai et al. (2017) and Hill et al. (2018) that a significant positive relationship exist between students' self-concept and interest. This shows that a high performance in Physics is expected from the students and that was the case of this study. It is expected that students' academic self-concept will enhance their interest in Physics.

The findings equally revealed that 96, which represents (48%) of the students demonstrated high academic performance as revealed in Table 3. This implies that

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

students' self-concept had a positive impact on their academic performance in Physics. This was subjected to correlational analysis in Table 5, which revealed a significant positive correlation between self-concept and academic performance of students in Physics. Therefore, the null hypothesis which says that there is no relationship between self-concept and academic performance of students in Physics was rejected. The finding was in agreement with Imo and Kefas (2016) who found that there was a positive correlation between self-concept and academic performance of students in science subjects. This implies that students' self-confidence can enhance their academic performance in Physics.

The findings further revealed that many of the students had high self-concept. This agrees with the findings of York (2013) that secondary school students have positive self-concept. It is believed that students who have positive academic concept in a subject will be positively displayed high interest in the subject. This may further explain the students' high performance in Physics as measured in the study. The relationship between the predictor variable and academic performance in Physics was found to be significant. For instance the relationship between self-concept and academic performance in Physics gave the highest correlation coefficient of 0.72. The implication of this is that a student's belief in his/her ability to study Physics is uppermost in arousing positive interest in the subject. This agrees with the findings of Ajayi, Abisola and Adeyanju (2016) that a student who has positive academic self-concept about himself in Physics will have positive interest in Physics. The findings revealed that the predictor variable (self-concept) significantly predicted SS2 students' interest and

ISSN 3026 – 9318
INTERNATIONAL JOURNAL OF ARTS, COMMUNICATION AND PEDAGOGY (IJACOP)
Peer-Reviewed, Open Access, International Journal
Volume 4, Issue 1, May, 2025 https://ijacop.org.ng

academic performance in Physics and accounted for 19.8% of the explained variance. The results of the study are not surprising because earlier studies on the relationship between self-concept, interest and academic performance in Physics had revealed that student self-confidence enhances their interest and academic performance in Physics.

Conclusion

Based on the finding of the study, it can be concluded that many students in the study area are positively displayed positive interest in studying Physics, exhibited high performance and self-confidence. The predictor variable, that is, self-concept has significant relationship with students' interest and academic performance. If physics teachers therefore, work at helping students believe they can study physics, their self-confidence will be raised and that will definitely enhance their performance in the subject.

Recommendations

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

1. Teachers and educators should strive to create a supportive learning environment that fosters positive self-concept among Physics students. This can be achieved through positive reinforcement.

2. Physics teachers should incorporate strategies that promote self-concept development into their instructional practices through activities that help students recognize their strengths, set realistic goals and develop a sense of self-efficacy in Physics.

3. School administrators and Physics teachers should identify students with low self-

concept and provide targeted support to help them build confidence and motivation in Physics.

References

Adeyemi, O. O. & Achimugu, L. (2024). Effect of blended learning strategy on students' interest in geometry in Kogi State. *Journal of Science, Technology and Mathematics Pedagogy, 2*(2), 27-36.

Ajayi, K. O., Abisola, L. O. & Adeyanju, H. I. (2016). Effect of students' attitudes and self-concept on achievement in Mathematics. *Journal of Research in National Development, 9*(2), 200-211.

Akubor, F. (2024). *Effect of scaffolding instructional strategy on senior secondary school students' academic performance in Physics in Kogi State.* An Unpublished M.Sc.Ed. Thesis, Prince Abubakar Audu University, Anyigba, Kogi State

Hill, H. C., Charalambous, C. Y. & McGinn, D. (2018). The role of parental support in shaping students' self-concept and interest in Physics. *Journal of Research in Science Teaching, 55*(4), 531-553.

Imo, G. C. & Kefas, H. (2016). Study habit, science anxiety and self-concept as correlates of senior secondary school two students' attitudes towards science subjects in Jos, Plateau State, Nigeria. *International Journal of Research in Science, Technology and Mathematics Education, 4*(2), 1-10.

Kadir, A., Yassin, S. F. M. & Yunus, A. S. M. (2020). The relationship between self-concept and academic achievement in Physics among high students. *Journal of Science Education and Technology, 29*(2), 257-268.

Kaya, S. & Lundholm, C. (2020). Investigating the relationship between interest and motivation to learn Physics among secondary school students. *Journal of Science Education and Technology, 29*(3), 437-448.

Liu, X., Zhang, Y. & Li, Y. (2020). Self-concept and academic achievement in Physics. A systematic review. *Journal of Physics Teachers Education, 6*(1), 1-13.

Mahanta, D. (2014). Impact of attitude and self-concept of students towards Mathematics upon their achievement in Mathematics. *International Journal of Theoretical and Applied Science, 6*(1), 20-35.

Marsh, H. W., Martin, A. J. & Yeung, A. S. (2017). The impact of teacher support on students' self-concept and interest in Physics. *Journal of Educational Psychology,*

109(3), 341-354.

Oche, O. A. (2024). *Attitudes and self-concept as correlates of interest and academic performance in Physics in Kogi State, Nigeria.* An Unpublished M.Sc. Ed. Thesis, Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria.

Onuka, A. & Ogbebor, U. C. (2014). Gender, students' attitudes and self-concept as determinants of achievement. *Nigerian Journal of Educational Research and Evaluation, 14*(3), 195-206.

Osborn, J., Jones, S. & Lynch, J. (2019). Interest in Physics among secondary school students. A survey study. *Physics Education, 54*(4), 045015.

Pajares, F. (2020). Self-efficacy beliefs in academic settings. *Review of Educational Research, 79*(4), 752-774

Simpson, R. D. & Oliver, J. S. (2021). A summary of major influences on attitudes towards and achievement in science among adolescent students. *Science Education, 74*(1), 1-18.

Tai, C. C., Chu, H.E. & Lee, Y. F. (2017). The effect of hands-on learning on students' efficacy and interest in Physics. *Journal of Science Education and Technology, 26*(3), 341-353.

York, L. (2013). *Validation of the academic self-concept questionnaire*. Retrieved from www.younglives.org.k/.../vietnam-scholarlyarticle.