INFLUENCE OF ACHIEVEMENT MOTIVATION AND ACADEMIC SELF CONCEPT ON ACADEMIC PERFORMANCE IN PHYSICS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN KATSINA STATE, NIGERIA

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Abstract

The study examined the Influence of Achievement Motivation and Academic Self-Concept on Academic Performance in Physics among Senior Secondary School Students in Katsina State, Nigeria. The study was guided by five objectives and five corresponding hypotheses. A descriptive survey research design was adopted. The study population comprised 17,152 students, and a cluster sampling method was used to select schools across three local governments in Katsina state. From this population, a sample of 370 students was chosen using a systematic random sampling technique. Self-developed Achievement Motivation Questionnaire (SDAMQ) and the Academic Self-Concept Scale (ASCS) were adapted, with reliability coefficients of 0.81 and 0.75, respectively. Additionally, students' second-term examination results for the 2024/2025 academic year were used. The hypotheses were tested using multiple regression, Pearson Product-Moment Correlation (PPMC) and t-test statistical methods. Findings indicated a significant positive relationship between Achievement Motivation and Academic Performance, as well as Academic Self-Concept and Academic Performance in Physics. Furthermore, significant gender-based differences were found in both Achievement Motivation and Academic Self-Concept. The study concluded that both variables are strongly linked to academic performance. Among its recommendations, it suggested that teachers adopt flexible and student-friendly approaches to engage learners in school activities, thereby enhancing their self-concept and academic outcomes.

Keywords: Achievement Motivation, Academic Self-concept, Academic Performance in Physics.

Introduction

Education plays an essential and irreplaceable role in shaping students' lives, as it encompasses the entirety of life experiences and serves as a means of developing knowledge and skills for both personal growth and societal advancement. As such, it is crucial that children are educated in ways that foster acceptable behaviour, social competence, ethical values, self-concept, personality development, decision-making abilities, emotional intelligence, and positive attitudes. When students exhibit poor academic performance, it can often be linked to deficiencies in these areas, potentially leading to reduced achievement motivation and a weakened self-concept.

Academic performance is a key measure of students' success and is affected by a complex mix of cognitive and non-cognitive factors. Among the most influential are achievement motivation and self-concept, which are especially critical during adolescence, a developmental stage marked by identity exploration, goal setting, and academic choices (Eccles & Roeser, 2011). Physics, defined as the structured study of matter and energy in natural phenomena, plays a vital role in helping learners understand and appreciate the technological and industrial world. According to the National Education Research Development Centre (2004), Physics promotes logical and clear thinking in interpreting natural events. Balogun (2002) further noted that students' performance in Physics is significantly affected by their self-concept and attitudes toward the subject, which are often shaped by their home environments.

Bada (2023) described motivation as an internal drive that guides and sustains behaviour, pushing individuals toward specific goals. For instance, someone driven by the need for achievement or status might dedicate extensive time to study, apply to graduate school, and pursue a career in academia. In this context, motivation acts as the underlying force behind one's efforts. Erhuvwu and Adeyemi (2019) defined achievement motivation as the drive to succeed, marked by persistence and effort in the face of challenges. Similarly, Ericksen (2018) described it as a consistent personality trait that determines how persistently an individual works toward goals, aiming to reach or exceed certain standards of excellence. In an educational setting, achievement motivation is seen as the internal force behind student behavior in performance situations. Therefore, motivated individuals are more inclined to tackle problems rather than rely on luck.

Eccles, as cited in Matovu (2012), defined self-concept as one's general perception of self across various domains, shaped by experiences and self-evaluations influenced by the surrounding environment. Saikia (2020) added that self-concept includes a person's thoughts and feelings about themselves, along with the psychological processes that shape behaviour and adaptability. Specifically, academic self-concept refers to how students evaluate their own abilities in particular academic subjects (Trautwein et al., 2006). For instance, a student who believes they are not good at a subject is likely to show little interest or put minimal effort into it, compared to other subjects where they feel more confident. Self-concept not only directly impacts academic performance but also interacts with other factors in determining a student's willingness to engage in achievement-related activities. However, Matovu (2012) considered Academic self-concept as one's self-evaluation regarding specific academic areas and how students feel about themselves as learners. Baran & Maskan (2011) suggest that environmental factors are essential in the development of academic self-concept. They believed that the academic self-concept influences the learning process, and thus the learner's achievement.

The study was delimited to public schools in Katsina Zonal Education Quality Assurance, katsina state, Nigeria. The zone consists of three local governments, namely: Katsina, Kaita and Jibia. In this study, Senior Secondary II students were chosen because they attend full session in the school unlike senior secondary school I and III students. The researcher based the study on two key theoretical frameworks: Self-Determination Theory (SDT), which

supports both achievement motivation and self-concept, and the Self-Regulated Learning (SRL) Theory, which explains the aspect of academic performance.

Self-Determination Theory, developed by Ryan and Deci (2000), suggests that human motivation is rooted in the fulfilment of three fundamental psychological needs: autonomy, competence, and relatedness. When these needs are satisfied, individuals tend to develop a strong self-concept and exhibit greater achievement motivation. The theory differentiates between intrinsic motivations. Students who feel in control of their learning and capable in their abilities are more inclined to take on difficult tasks and work toward their goals. The concept of perceived competence which is a key component of self-concept is central to this theory. A healthy self-concept forms when individuals feel effective in their surroundings and are supported through meaningful relationships (Ryan & Deci, 2000).

Self-Regulated Learning Theory, introduced by Zimmerman (2002), centres on students' ability to actively manage their own learning. This includes planning, monitoring, and assessing their academic progress. Self-regulated learners use techniques such as goal setting, self-monitoring, and reflection to enhance their learning. According to this theory, students who effectively manage their time, set clear academic goals, and apply learning strategies are more likely to achieve better academic outcomes.

Statement of the Problem

Achievement motivation is considered a foundation for a successful life (Ericksen, 2018). However, it has been observed that many students lack a strong focus on academic success. They often set unrealistic or overly simplistic goals that are difficult to achieve, which ultimately leads to discouragement and failure to meet their educational objectives. Additionally, it has been noticed that many secondary school students appear to show little interest in their academic performance, often attributing their outcomes to luck or external factors rather than personal effort. This lack of motivation and low aspiration causes students to avoid academic tasks, reflecting weak commitment to goal-oriented activities. Once students adopt such beliefs, their academic performance tends to suffer, as these attitudes influence the types of activities they choose, the effort they invest, and the cognitive strategies they apply to learning.

An analysis of students' performance in Physics across the federation from 2014 to 2023 reveals that in most of these years, the failure rate exceeded 50%, with only 2014, 2017, and 2018 recording pass rates above 50% (WAEC, 2023). This persistent high failure rate in Physics prompted the researcher to examine the influence of Achievement Motivation and Academic Self-Concept on academic performance in Physics among senior secondary school students in Katsina State, Nigeria. Ryan (2013) pointed out that Physics is often seen as the most challenging branch of science and generally attracts fewer students compared to subjects like Chemistry and Biology. Many students perceive Physics as a difficult subject during their high school years, and these challenges tend to intensify at the college and graduate levels.

Objectives of the Study

The following objectives were formulated for the study:

1. To ascertain the combine influence of achievement motivation and Academic self-concept on academic performance in Physics among senior secondary school students in Katsina State.
2. To find out the relative influence of achievement motivation on academic performance in Physics among senior secondary school students in Katsina State.
3. To find out the relative influence of academic self-concept on academic performance in Physics among senior secondary school students in Katsina State.
4. To determine the gender difference in Achievement motivation among senior secondary school students in Katsina State.
5. To determine the gender difference in academic self-concept among senior secondary school students in Katsina State.

Hypotheses

The following hypotheses were tested at .05 level of significance:

$\mathbf{H_{01}}$. There is no significant combine influence of Achievement motivation and academic self-concept on academic performance in Physics among senior secondary school students in Katsina State.

$\mathbf{H_{02}}$. There is no significant relationship between Achievement motivation and academic performance in Physics among senior secondary school students in Katsina State.

$\mathbf{H_{03}}$. There is no significant relationship between Self-concept and academic performance in Physics among senior secondary school students in Katsina State.

$\mathbf{H_{04}}$. There is no significant difference in achievement motivation between male and female of senior secondary school students in Katsina State.

$\mathbf{H_{05}}$. There is no significant difference in academic self-concept between male and female of senior secondary school students in Katsina State.

Methodology

The study adopted a descriptive survey research design. The target population included all Senior Secondary School (SS II) students within the Katsina Zonal Education Quality Assurance area, Katsina State. The population consist of 17,152 students. To select participants, a cluster sampling method was used to choose schools from the three local government areas in the zone: Katsina, Kaita, and Jibiya. From this population, a sample of 370 students was drawn, in accordance with the sample size guidelines provided by the Research Advisor (2006) table. Within the selected schools, students were chosen using a

systematic random sampling technique. The sampling was guided by a specific formula used to determine the appropriate number of participants as; Sample = $\frac{\text{N. of Students per School}}{\text{Total Population}}$ x 370

The researcher utilized two main instruments for data collection: a self-developed Achievement Motivation Questionnaire (SDAMQ) and the Academic Self-Concept Scale (ASCS) designed by Flowers, Raynor, and White (2013). Additionally, students' second-term Physics examination results for the 2024/2025 academic session were incorporated into the study. All instruments were structured using a 4-point Likert scale format, ranging from 4 (Strongly Agree) to 1 (Strongly Disagree). To ensure the instruments accurately measured the intended constructs, both face and content validity were established. A pilot study was carried out, and the test-retest method was employed to assess reliability. The reliability coefficients obtained were 0.81 for the SDAMQ and 0.75 for the ASCS, indicating acceptable levels of consistency.

A total of 370 copies of the questionnaires were distributed to students in the selected schools. The administration process was conducted with strict confidentiality, and participants were assured that their responses would be used solely for research purposes and treated with the utmost privacy. The quantitative data collected were tested using inferential statistics of multiple regression, PPMC and t-test for independent sample. Multiple regression analysis was used to test the first hypothesis, which examined the combined correlation between the variables. Hypotheses two and three were tested using PPMC, while independent samples t-tests were employed to analyse hypotheses four and five.

Results

Hypothesis One: There is no significant combine influence of Achievement motivation and academic self-concept on academic performance in Physics among senior secondary school students in Katsina state.

Table 1: Regression analysis of Achievement Motivation and Academic Self-concept on Academic Performance in Physics

R = .654[a]
R Square =.578
Adjusted R Square = .537
Std. Error of the Estimate = 9.6578

Model	Sum of Squares value	df	Mean Square	F-value	Sig. of F-value	Remark
Regression	52235.137	1	52235.137			
Residual	93242.264	368	253.375		.000[b]	**Sig**
Total	342.543					
	145477.401	369				

Table 1 indicates that combined Achievement Motivation and Academic Self-concept significantly contributed only 57.8% to the total variance in academic performance in Physics among Senior Secondary School Students in Katsina State. The R^2 value of .578 indicates high

positive relationship and it is significant at .05 level of confidence. This means that there is significant relative combined influence of Achievement Motivation and Academic Self-concept on Academic Performance in Physics among Senior Secondary School Students in Katsina State.

Hypothesis Two: There is no significant relationship between Achievement motivation and academic performance in Physics among senior secondary school students in Katsina state.

Table 2: PPMC showing the Relationship between Achievement Motivation and Academic Performance in Physics.

Variables	N	Mean	SD	r-value	p-value	Decision
Achievement Motivation		55.5643	12.7654			
	370			.591	.013	Significant
Academic Performance		52.7654	10.3426			

Table 2 indicates a moderate positive correlation (r-value = .591) which is significant at .05 alpha levels of significance ($p = .013$, $\alpha < .05$). Therefore, since the p-value is less than the alpha-value the null hypothesis of no significant relationship between Achievement Motivation and Academic Performance in Physics among senior secondary school students in Katsina state is rejected. This means that, there is significant relationship between Achievement Motivation and Academic Performance in Physics among senior secondary school students in Katsina state.

Hypothesis Three: There is no significant relationship between academic self-concept and academic performance in Physics among senior secondary school students in Katsina state

Table 3: PPMC showing the Relationship between Academic self-concept and Academic Performance in Physics

Variables	N	Mean	SD	r-value	p-value	Decision
Self-concept		62.4390	13.7395			
	370			.475	.007	Significant
Academic Performance		52.7654	10.3426			

Table 3 reveals low positive relationship (r-value = .475) which is significant at .05 alpha levels of significance ($p = .007$, $\alpha < .05$). Therefore, since the p-value of .007 is less than the alpha-value .05 the stated null hypothesis is rejected. This implies that, there is significant relationship between academic self-concept on academic performance in Physics among senior secondary school students in Katsina State.

Hypothesis Four: There is no significant difference in achievement motivation between male and female students Achievement motivation.

Table 4: t-test showing the gender difference in achievement motivation among senior secondary school students in Katsina state?

Variable	Gender	N	Mean	SD	df	t-value	p-value
	Male	165	54.7389	11.6091			
Achievement Motivation					368	6.986	.016
	Female	205	58.8730	12.6752			

Table 4 reveals that there is significant difference in the influence of Achievement Motivation between physics students of senior secondary school in Katsina state, Nigeria. Reason being the fact that the calculated; P-value (**.**016) is less than α-value (**.**05). Therefore, the hypothesis is rejected. This implies that, there is significant difference in the influence of achievement motivation between male and female Physics Students of senior secondary school in Katsina state, Nigeria. Based on gender. The table also shows that male students had a mean of 54.7389 less than that of female of 58.8730. This implies that, achievement motivation is higher in female students than their male counterpart.

Hypothesis Five: There is no significant difference in academic self-concept between male and female students self-concept.

Table 5: t-test showing the difference in academic self-concept **between Male and Female Physics Students**

Variable	Gender	N	Mean	SD	df	t-value	p-value
	Male	165	61.3452	11.4720			
Self-concept					368	5.019	.000
	Female	205	63.4356	12.1038			

Table 5 reveals that there is significant difference in the academic self-concept between male and female Physics Students of Federal Unity Colleges in North West, Nigeria. Reason being the fact that the calculated; P-value (**.**000) is less than α-value (**.**05). This means, the null hypothesis is rejected. This implies that, there is no significant difference in the academic self-concept between male and female Physics students of Federal Unity Colleges in North West, Nigeria, based on gender. The table also shows that female students found to have higher mean score of 63.4356 than the male with mean score of 61.4352. This indicates that, academic self-concept is higher in female students than male students.

Discussions of Findings

Hypothesis one, which proposed that achievement motivation and academic self-concept combined would not significantly influence academic performance in Physics among Senior

Secondary School students in Katsina State, was rejected. This result supports the findings of Affum et al. (2014), who reported that most high school students with high motivation and strong self-concept performed well in achievement tests. The outcome of this study reinforces the significance of both achievement motivation and academic self-concept in enhancing academic performance.

Hypothesis two, which stated that achievement motivation alone does not significantly impact academic performance in Physics, was also rejected. The data indicated that achievement motivation is a predictor of students' performance in Physics. This aligns with the findings of Awan et al. (2011), who established a strong relationship between achievement motivation and academic success. Similarly, Affum et al. (2014) found a positive though statistically insignificant correlation between achievement motivation and academic performance.

Hypothesis three, which assumed that self-concept alone does not significantly influence academic performance in Physics, was rejected as well. This result supports the study by Archana et al. (2013), which demonstrated a meaningful relationship between students' self-concept and academic achievement, particularly in mathematics. Bala (2014) also observed significant differences in performance between students with high and low self-concept. Solomon et al. (2017) confirmed these findings, highlighting that students' beliefs about their academic abilities are key factors that contribute to the achievement of their educational goals.

Hypothesis four, which suggested no significant difference in achievement motivation between male and female students, was rejected. This result contradicts Okotie et al. (2019), who found that a larger proportion of male students (91%) were highly motivated compared to female students (11.9%) with lower motivation. However, the current study's findings are consistent with those of Sikhwari (2014), who reported that female students were more motivated than their male peers. This discrepancy in findings could be attributed to environmental or contextual factors. Similarly, Solomon et al. (2017) found that female students generally exhibit higher motivation levels than males.

Hypothesis five, which stated there is no significant difference in academic self-concept between male and female students, was also rejected. This finding does not align with the study by Rana and Iqbal (2005), cited in Affum et al. (2014), which suggested that males possess a higher self-concept than females. However, it agrees with Awan et al. (2011), who found notable gender differences in self-concept favoring female students. Bala (2014) also identified a significant negative effect of gender on self-concept and academic performance. Kumar and Choudhuri (2017) reported a stronger positive correlation between self-concept and academic performance in female students ($r = .28$) than in males ($r = .17$). Conversely, Heath and Augustine (2014) observed no significant gender difference in the relationship between self-concept and academic achievement.

Conclusion

Based on the findings of this research, the following conclusions were made:

The study demonstrated a significant combined relationship of achievement motivation and academic self-concept on students' academic performance. Additionally, a positive relationship was found between each of these variables, achievement motivation and academic self-concept on the academic performance of secondary school students. This suggests that students with a strong academic self-concept are more likely to be motivated to study and achieve better academic outcomes than those with a weaker self-concept. The results also revealed notable significant gender differences in the influence of each of achievement motivation and self-concept of senior secondary school in the area.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Parents and guardians should foster a supportive environment that nurtures their children's self-concept. Instead of using harsh or demeaning language, they should offer encouragement and affirmations to help children develop a strong sense of self-worth and confidence, which in turn can enhance academic performance.

2. Students with creative potential should receive adequate encouragement and support, not only from the government but also from the wider community. This collective effort will help boost achievement motivation among secondary school learners.

3. Parental involvement is essential in shaping a child's self-concept. Providing emotional support, affection, and motivation at home can help students build a more positive and resilient academic self-image.

4. More effective counselling services should be made available in schools, especially for male students, who were identified as less motivated. In coeducational schools, classroom arrangements should also consider gender sensitivity to promote comfort and participation.

5. Schools should actively identify students with low self-concept particularly males and offer targeted interventions. These may include mindfulness activities, emotional support programs, and the creation of a school environment where students feel safe and encouraged to seek help when needed.

References

Affum, E., Eric, A.A., Barnie, J., and Forkuoh, K.S. (2014). Achievement motivation, academic self-concept and academic achievement among high school students. *European journal of research and reflection in educational sciences*. Vol. 2 No. 2, 2014 ISSN 2056-5852.

Archana, K., Chamundeswari, S. (2013). Self-concept and academic achievement of students at the higher secondary level. *Journal of sociological research*. ISSN 1948-5468.DOI: https://doi.org/10.5296/jsr.v4i2.3909.

Awan, R., Anjum, N., and Ghazala, N. (2011). A study of relationship between achievement motivation, academic self-concept and achievement in English and Mathematics at secondary level. *International education studies achieves, Vol. 4, No. 3. ISSN (online): 1913-9039.* DOI:10.5539/ies.v4n3p72.

Bada, S.O. (2023). *Lecture Note for Postgraduate students (Ph.D)*. Department of educational psychology and counselling, Faculty of education, Federal university Dutsin-ma. Katsina Stae

Balogun, T.A. (2002): *Interest in science and technology education. London*; Evans Brother Ltd.

Baran, M. & Maskan, A.K. (2011). A Study of relationship between self-concepts, some variables and physics course achievement. *International journal of education.* vol 3, no 1.

Chondhuri, S. & Kumar, S. J. (2017). Influence of academic self- concept on academic achievement of secondary schools of Varanasi city, India. *International of educational psychology*, 8(3), 56-66.

Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence, 21(1), 225–241*. https://doi.org/10.1111/j.1532-7795.2010.00725.x.

Erhuvwu, Stella, Okotie. & Adeyemi, T. Florence. (2019). Achievement motivation as a predictor of academic achievement of senior secondary school student in Mathematics. *European journal of education and development psychology* Vol 7 (3), 36-45.

Ericksen, A. O. (2018). Enhancing Motivation and Learning. Jossy-Bass publishers limited.

Flowers, L.O., Raynor, J.E., & White, E.N. (2013). Investigation of academic self-concept of undergraduates in STEM courses. *Journal of studies in Social Sciences*, 5(1), 1 - 11 .

Health, B. & Augustine, N. A. (2014).Self-concept and students' academic performance in college of education, Akwanga, Nasarawa Sate, Nigeria. *World Young Researchers Journal*, 3(2), 31-37.

Matovu, M. (2012). Academic self-concept and academic achievement among students. *International online journal of educational sciences*. Vol. 4(1).

Okotie, S.E. & Florence, T.A. (2019). Achievement motivation as a predictor of academic achievement of senior secondary school student in mathematics. *Journal of educational and development psychology.* vol.8, no.4, pp.46-55, published by ECRTD-UK.

Rana, R. A., & Iqbal, S. (2005). *Self-concept and academic achievement in science*: The impact of self-concept and gender among higher secondary students in Punjab, Pakistan. Unpublished research/survey.

Ryan, M.G. (2013). Attitude and motivation towards learning physics. *International journal of engineering research & technology (IJERT)*. Rizal Technological University. ISSN: 2278-0181 Vol. 2 Issue 11, November – 2013.

Ryan, R. M., & Deci, E. L. (2000). *Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being*. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Saikia, R. (2020). A Study on self-concept. *International education and research journal*, vol: 6, issue:6, ISSN:2454-9916.

Sikhwari T.D (2014): A study of the relationship between motivation self- concept and academic achievement of students at a university of Limpopo province, *South Africa. International journal of educational science* 6(1) 19-25.

Solomon, J.K., Ofori, A., Eric, N., & Sekyere, A.M. (2017). Relationship between motivation, academic self-concept and academic achievement among students at a ghanian technical university. *International journal of human resources studies*. Vol. 7, No. 1. Korantwi-barimah. DOI: HTTPS://doi.org/10.5296/ijhrs.v7i1.10459.

Trautwein, U., Ludtke, O., Koller, O., & Baumert, J. (2006). Self-esteem, academic self-concept, and achievement: How the learning environment moderates the dynamics of self-concept. *Journal of personality and social psychology*, 90, 334-349.

West Africa Examination Council (WAEC). *Chief examiner's report. Lagos*: WAEC, 2023, available at: Google Scholar.

Zimmerman, B. J. (2002). *Becoming a self-regulated learner: An overview*. Theory into practice, 41(2), 64–70. https://doi.org/10.1207/s15430421tip41022.