

INFLUENCE OF GENDER, INTEREST, AND SELF-EFFICACY ON ACADEMIC PERFORMANCE OF ELECTRICAL/ELECTRONIC TECHNOLOGY EDUCATION STUDENTS IN SOUTHWEST, NIGERIA

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Abstract

This study examined the influence of gender, interest, and self-efficacy on the academic performance of Electrical/Electronic Technology Education students in South-West Nigeria. The study was guided by three research questions. The study adopted a correlational research design and involved a population of 92 third-year students from universities offering Electrical/Electronic Technology Education program. A researcher-developed instrument titled Gender, Interest, and Self-Efficacy Questionnaire (GISEQ) was used to gather data, alongside students' Grade Point Averages (GPAs) to measure academic performance. The instrument was validated by experts and found reliable through a test-retest method with a coefficient of 0.83. Data were analyzed using Point-Biserial Correlation and Pearson Product-Moment Correlation. The results revealed a significant and positive relationship between gender and academic performance, with male students performing better than females. A strong and positive relationship was also found between students' interest in their field and their academic performance, while self-efficacy showed an even stronger positive correlation with academic performance. It was concluded that students' academic performance is not only influenced by intellectual abilities, but also by gender, personal interest, and self-efficacy. The study recommended that educators adopt more engaging and student-centered instructional strategies to stimulate interest and build self-confidence in learners. Support systems should also be put in place to address gender-based challenges in technical education.

Keywords: Gender, Interest, Self-Efficacy, Academic Performance

Introduction

Electrical and Electronic Technology Education is among the courses offered within Nigeria's tertiary education system. The programme is aimed at equipping students with the theoretical knowledge and practical skills required to design, maintain, and innovate electrical and electronic systems. This field is important in Nigeria due to the high demand for skilled technicians and engineers in the country (Elijah, et al., 2024). In South-West Nigeria, several universities, polytechnics, and colleges of education offer this program. The region is known for its educational advancements, ongoing infrastructural development and industrialization efforts (Anuoluwapo & Babalola, 2015) that requires the services of skilled Electrical and Electronic Technology Education graduates.

In Electrical and Electronic Technology Education, students' academic performance is an indicator of the level of skills acquired and a pointer to future career prospects. According to Robbins et al. (2004) academic performance includes measurable outcomes such as grades and test scores in addition to the development of essential skills like effective study habits and good time management. Similarly, academic performance refers to the quantifiable outcomes reflecting a

student's attainment of specific learning objectives set by an educational institution (York et al., 2015). Academic performance in Electrical and Electronic Technology Education is typically measured through a combination of theoretical knowledge, practical assessments, and project outcomes. Academic performance is influenced by a various factors, including individual characteristics, psychological attributes, and socio-cultural dynamics. Among these factors are gender, interest, and self-efficacy (Pajares, 2005; Bandura, 1997).

Gender has been a topical issue in engineering-related fields. Historically, Electrical and Electronic Technology Education has attracted more male than female students enrolment, and this reflect societal stereotypes that associate technical fields with masculinity (Eccles, 2007). Studies have shown conflicting results regarding the impact of gender on academic performance. For instance, Hyde and Mertz (2009) found that while males often outperform females in technical-related disciplines, the gap has been narrowing due to increased female participation and changing societal attitudes. In Nigeria, cultural factors, such as gender roles and expectations, may still limit female students' engagement in technical programs (Onyeocha et al., 2023). However, some studies suggest that female students who pursue technical education often exhibit high motivation and perform comparably to or better than their male counterparts when given equal opportunities (George et al., 2021).

Another factor that can influence academic performance is students' interest in their field of study. Interest is defined as an individual's focused attention, emotional engagement, and willingness to invest effort in a particular subject or activity (Eze, 2016). In Electrical and Electronic Technology Education, students with a strong interest are more likely to invest time and effort in mastering complex concepts and practical skills. According to Krapp (2002), interest influences cognitive engagement and persistence. Students who are interested in their field of study tend to exhibit higher levels of concentration, better problem-solving skills, and greater resilience which can translate into better academic outcomes. Students who choose Electrical and Electronic Technology voluntarily and are driven by a genuine interest, are likely to perform better than those who enroll due to external pressures or lack of alternatives.

Another important factor that can influence Electrical and Electronic Technology Education students' academic performance is self-efficacy. Self-efficacy refers to an individual's belief in their ability to succeed in specific tasks or situations (Bandura, 1997). Self-efficacy influences students' motivation, effort, and persistence, particularly in challenging fields like Electrical and Electronic Technology Education. Students with high self-efficacy are more likely to approach difficult tasks with confidence, set higher goals, and recover quickly from setbacks (Zimmerman, 2000). Bini and Idehen (2023) noted that self-efficacy determines whether students engage or disengage from academic tasks based on their perceived likelihood of success. In engineering-related fields, self-efficacy is important because of the field's demanding nature, which requires proficiency in both theoretical and practical contents. According to Lent et al. (2008), self-efficacy is a predictor of academic performance in engineering-related disciplines, as it mediates the relationship between ability and achievement. In Nigeria, where students may face additional challenges such as inadequate facilities or limited access to resources, self-efficacy can be an important factor in determining success (Joseph et al., 20). This study investigates how gender, interest, and self-efficacy influences the academic performance of Electrical and Electronic Technology Education students in South-West Nigeria.

The academic performance of Electrical and Electronic Technology Education students in South-West Nigeria is an issue that has implications for the region's technological and economic development. Studies have shown that gender, interest, and self-efficacy are key factors that may influence students' academic performance. Although previous studies have examined the influence of gender, interest, and self-efficacy on academic performance in various disciplines, there is limited research specifically focused on Electrical and Electronic Technology Education in South-West Nigeria. By examining these variables, this study aimed to contribute to the ongoing efforts to improve technical education in Nigeria and ensure that students are well-equipped to meet the demands of the labour market.

Objectives of the Study

The main objective of the study was to examine the influence of gender, interest and self-efficacy on academic performance of Electrical and Electronic Technology Education students in South-West, Nigeria. Specifically, the study sought to:

1. Examine the relationship between gender and the academic performance of Electrical/Electronic Technology Education students in South-West, Nigeria.
2. Investigate the relationship between interest and the academic performance of Electrical/Electronic Technology Education students in South-West Nigeria.
3. Examine the relationship between self-efficacy and the academic performance of Electrical/Electronic Technology Education students in South-West Nigeria?

Research Questions

The following research questions guided this study:

1. Does gender relates with academic performance of electrical/electronic technology education students in South-west Nigeria?
2. Does interest relates with academic performance of electrical/electronic technology education students in South-west Nigeria?
3. Does self-efficacy relates with academic performance of electrical/electronic technology education students in South-west Nigeria?

METHODOLOGY

Research Design: The study adopted a correlational research design. This design is appropriate for examining the extent to which two or more variables are related. According to Creswell (2018), correlational research helps to identify patterns of relationships between variables without manipulating them. Therefore, this design was considered suitable to investigate the relationship among gender, interest, self-efficacy, and academic performance.

Population of the Study: The study involved all 300-level Electrical/Electronic Technology Education students from the five universities offering the Electrical/Electronic Technology Education program in Southwest Nigeria. The total number of students was 92.

Sample and sampling technique: The sample of this study comprises all the ninety two students pursuing electrical/ electronic technology education in the south-west universities. This is because the total population size was relatively small and manageable.

Research Instrument: Data for the study were collected using a researcher-designed instrument titled Gender, Interest, and Self-Efficacy Questionnaire (GISEQ), which measured participants' gender, level of interest, and self-efficacy. To measure academic performance, the Grade Point Averages of the students were obtained from their respective departments.

Validity of the Instrument: The data collection instrument (GISEQ) underwent face validation by three experts. Their feedback and recommendations were used to improve and finalize the instrument.

Reliability of the Instrument: The reliability of the instrument was assessed using the test-retest method. The questionnaire was administered twice to 20 students from a university outside the study area. A reliability coefficient of 0.83 was recorded.

Procedure of Data Collection: Validated instruments were used for data collection. An introductory letter was submitted to the departments of the participating universities to obtain permission to conduct the study among their students. The researcher, assisted by four research assistants, distributed and retrieved the questionnaires. All the distributed questionnaires were successfully collected.

Method of Data Analysis: The data collected for this study was analyzed using the Point-Biserial Correlation (PBC) for Research Question 1, and the Pearson Product-Moment Correlation (PPMC) for Research Questions 2 and 3. The interpretation of the correlation coefficient (r) followed the guidelines suggested by Cohen (1988): (a) values between 0.01 and 0.20 indicate a very weak correlation, (b) 0.21 to 0.40 indicate a weak correlation, (c) 0.41 to 0.60 indicate a moderate correlation, (d) 0.61 to 0.80 indicate a strong correlation, and (e) 0.81 to 0.99 indicate a very strong correlation. An r value of 0 or 1 represents no correlation or a perfect correlation, respectively.

RESULTS

Research Question 1

Does gender relates with academic performance of electrical/electronic technology education students in South-west Nigeria?

Table 1: Point Bi-serial Correlation (PBC) output for academic performance and gender

		Academic Performance	Gender
Academic Performance	Pearson Correlation	1	.672**
	Sig. (2-tailed)		.000
Gender	Pearson Correlation	.672**	1
	Sig. (2-tailed)	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Table 1 presents the output of the point-bi-serial correlation used to examine the relationship between the academic performance of Electrical/Electronic Technology Education students and gender in South-West Nigeria. The results indicate that there is a positive and statistically significant relationship between students' academic performance and gender, $r_{pb(92)} = .672$, $p = .000$, at the 0.01 level of significance. The findings also reveal that, since "Male" was coded as 1, the academic performance of male students was higher than that of their female counterparts.

Research Question 2

Does interest relates with academic performance of electrical/electronic technology education students in South-west Nigeria?

Table 2: Pearson Products Moments Correlation (PPMC) output for academic performance and interest

		Academic Performance	Interest
Academic Performance	Pearson Correlation	1	.899**
	Sig. (2-tailed)		.000
Interest	Pearson Correlation	.899**	1
	Sig. (2-tailed)	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 indicates that the Pearson correlation coefficient, r, is .899 with a corresponding p-value of 0.000. The findings reveal that a strong positive correlation exists between interest and the academic performance of Electrical/Electronic Technology Education students. That is, an increase in students' interest leads to an increase in academic performance. The relationship was statistically significant (r = .899, n = 92, p = .000) at the 0.01 level of significance.

Research Question 3

Does self-efficacy relates with academic performance of electrical/electronic technology education students in South-west Nigeria?

Table 3: Pearson Products Moments Correlation (PPMC) output for academic performance and self-efficacy

		Academic Performance	Self-Efficacy
Academic Performance	Pearson Correlation	1	.935**
	Sig. (2-tailed)		.000
Self-Efficacy	Pearson Correlation	.935**	1
	Sig. (2-tailed)	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Outputs (Version 26)

From Table 1, the Pearson correlation coefficient, r, of 0.935 with a corresponding p-value of 0.000 indicates that there is a strong positive relationship between self-efficacy and the academic performance of Electrical/Electronic

Technology Education students. That is, academic performance increases with an increase in students' self-efficacy. The relationship was statistically significant ($r = .935$, $n = 92$, $p = .000$) at the 0.01 level of significance.

Findings of the Study

1. The findings show that there is a clear relationship between gender and academic performance. Male students performed better than female students.
2. There is a strong and positive relationship between Electrical/Electronic Technology Education students' interest in their course and their academic performance. In other words, the more interested students are in what they are studying, the better they tend to perform in their academics.
3. The study found a very strong and positive relationship between Electrical/Electronic Technology Education students' self-efficacy and their academic performance. This means that students who believe in themselves and their abilities tend to achieve better academic results.

Discussion of Findings

The findings of the study revealed a significant positive relationship between gender and academic performance. It indicated that male students outperformed their female counterparts in Electrical/Electronic Technology Education. This finding aligns with the assertions of Eccles (2007), who observed that technical fields such as electrical and electronics engineering have long been stereotyped as male-dominated. Similarly, Onyeocha et al. (2023) noted that societal and cultural expectations in Nigeria tend to limit female students' participation and performance in male-dominated technical disciplines. Furthermore, Ogundola (2020) supported this finding by suggesting that academic abilities in technical disciplines, have often been assumed to favour male students. However, this result contrasts with the findings of Wrigley-Asante (2023), who found no significant difference between male and female students in terms of intellectual capability and academic performance. They argued that when given equal opportunities and a supportive environment, female students can perform just as well as their male counterparts. Similarly, Hyde and Mertz (2009) reported a narrowing gender gap in technical-related fields, with increasing female representation and achievement.

The study also found a strong, positive and significant relationship between students' interest and their academic performance. This implies that students who show greater interest in Electrical/Electronic Technology Education tend to achieve higher academic performance. This outcome corroborates the findings of Krapp (2002) and Eze (2016), who emphasized the role of interest in promoting engagement, persistence, and motivation that can lead to academic success. Students who are genuinely interested in a subject are more likely to commit time and effort to learning, resulting in better understanding and performance. Also, Okafor (2020) noted that students' interest is a strong psychological factor influencing their concentration and involvement in academic tasks. This implies that when students find their course content meaningful and engaging, they are more likely to excel academically.

The findings of the study further revealed a very strong and positive relationship between self-efficacy and academic performance. This indicate that Electrical/Electronic Technology Education students who believe in their capabilities tend to perform better academically. This is in agreement

with the theoretical postulation of Bandura (1997), who defined self-efficacy as the belief in one's ability to execute tasks successfully. In support of this findings Bini and Idehen (2023) found that students with higher academic self-efficacy are more proactive, engage more deeply with learning tasks, and tend to score higher in both theoretical and practical assessments. Ojeleye et al. (2022) similarly observed that self-efficacy correlates strongly with academic resilience and task completion. Conversely, Pajares (2005) note that while self-efficacy is a significant predictor of academic performance, it should be complemented with skills, prior knowledge, and learning environments. According to him, high self-belief without competence or support structures may lead to overconfidence or poor academic outcomes.

Conclusion

This study investigated the influence of gender, interest, and self-efficacy on the academic performance of Electrical/Electronic Technology Education students in South-West Nigeria. The findings revealed that all three variables have statistically significant relationships with academic performance. Specifically, male students were found to perform better than female students. Findings also suggests that when students are genuinely interested in what they are learning, they are more likely to invest time and effort into their studies that will lead to improved academic outcomes. Similarly, students who had a strong belief in their abilities demonstrated higher academic achievement, and this reinforces the importance of psychological factors in education. Therefore, academic performance of Electrical/Electronic Technology Education students is not only influenced by intellectual abilities, but also by gender, personal interest, and self-efficacy.

Recommendations

1. In order to enhance students' interest in the course, lecturers should adopt engaging, practical, and student-centered teaching methods.
2. Teachers and academic advisers should encourage students through constructive feedback, goal-setting, and positive reinforcement to strengthen their self-efficacy.
3. Further research should be conducted to understand the specific challenges faced by female students in technical education programs.

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