

INFLUENCE OF SELF-EFFICACY ON LEARNING BEHAVIOUR OF ELECTRICAL AND ELECTRONICS TECHNOLOGY EDUCATION STUDENTS

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Abstract

This study examined the relationship and influence of self-efficacy on the learning behaviour of electrical and electronics technology education students in universities in Southwest Nigeria. The research was motivated by the increasing recognition of psychological constructs such as self-efficacy as determinants of students' engagement and performance in technical and vocational education. A correlational survey research design was adopted. The population of the study comprised all 158 electrical and electronics technology education students across five universities in Southwest Nigeria. A total enumeration sampling technique was employed. Data were collected using two validated instruments: the Self-efficacy for Learning Performance (SLP) scale and the Students' Learning Style Scale. Reliability coefficients of .71 and .78 were obtained, respectively. Data were analyzed using Pearson Product Moment Correlation and linear regression analysis at .05 level of significance. Findings revealed a moderate and significant positive relationship between self-efficacy and learning behaviour ($r = .520, p < .05$), indicating that students with higher self-efficacy tend to adopt more positive learning behaviours. However, regression analysis showed that self-efficacy did not significantly influence learning behaviour ($R^2 = .086, F = .843, p > .05$). This implies that while self-efficacy and learning behaviour are related, other factors beyond self-efficacy may account for the variations in students' learning behaviours. The study concluded that while self-efficacy is significantly associated with students' learning behaviours, it does not independently determine them. It recommends that interventions to improve students' learning outcomes in technical education should combine efforts to strengthen self-efficacy with other variables within the learning environment.

Keywords: *Self-efficacy, Learning Behaviour, Electrical and Electronics Technology Education, Technical Education*

Introduction

Electrical and electrical and electronics technology education, often regarded as complementary and interdependent areas within the broader technical education programme, is structured to equip learners with knowledge and skills in design, construction, installation, maintenance, and even the entrepreneurial aspects of electrical and electronic devices and systems (Ogbuanya & Ohanu, 2010; Tsoho, 2013). This specialization is tailored for individuals seeking careers in the development, implementation, and servicing of electrical and electronic systems across residential, commercial, and industrial settings (Chukwuedo, et al., 2012).

As the field continues to evolve, students' ability to integrate both theoretical understanding and practical application is shaped to a large extent by their psychological disposition toward learning. Among the numerous psychological constructs emphasized in educational studies, self-efficacy has been highlighted as a major determinant of students' learning behaviours and overall achievement (Basileo, et al., 2024). Self-efficacy is the confidence a

learner has in their capacity to carry out tasks effectively or accomplish specific goals. In educational contexts, this belief influences their readiness to tackle difficult challenges, the amount of effort they put forth, and their persistence in overcoming obstacles (Venugopal et al., 2020; Cherry, 2020).

Self-efficacy can be understood as an evolving set of learned beliefs, attitudes, and perceptions that an individual accepts as true about their own existence. Balogun and Olanrewaju (2016) defined self-efficacy as an individual judgment and belief in his/her capability to effectively execute, perform and succeed in a particular task. Self-efficacy is very essential in academic environment because it determines how well students do in school or how well students learn in their course of study. Any student who is fully aware of him/herself has high tendency of doing well in their academics. On the other hand, awareness and recognition of their strength and weaknesses will play a very significant role in the way and manner they handle things around them. For instance, students with a positive self-efficacy tend to engage in deep learning strategies that lead to better performance (Üner, et. al., 2020). Researchers also opined that self-efficacy can enable student to build self-confidence in themselves both at school and at work, and it could equally stir them to pursue academic excellence. Invariably, electrical and electronics technology students whose self-efficacy has been developed over time may not have much difficulty in handling responsibilities or any academic task. Therefore, electrical and electrical and electronics technology students, who often deal with complex, technical and hands-on learning experiences, a strong sense of self-efficacy may be crucial to developing effective learning behaviours.

Student learning behaviour encompasses the range of actions, attitudes, strategies and approaches that student adopt while engaging in the learning process. These behaviours can include time management, engagement with tasks, help-seeking, self-regulation, and the use of cognitive strategies (Zimmerman, 2000). Geitz, et al. (2016) defined learning behaviour as the students' mental preparedness to engage in learning, reflecting their resourcefulness, creativity, imagination, enthusiasm for learning, strong interest in reading and writing. Students who develop a positive behaviour to learning are likely to perform better than students who display uncared attitude towards learning. Rauch (2021) stated that some of the factors that may determine the behaviour of students to learning include individual characteristics, and immediate environment. Research has shown that students with high self-efficacy are more likely to engage in positive learning behaviours, such as setting challenging goals, academic motivation and maintaining resilience when confronted with academic difficulties (Shengyao, et al., 2024). In the context of electrical and electrical and electronics technology education where problem-solving, critical thinking, and technical skills are integral, such behaviours are instrumental in achieving academic success. Consequently, in a situation where students possess a negative self-efficacy these could affect their learning behaviour and there will be a resultant negative influence on their performance be it in the cognitive learning aspect or in the psychomotor skill acquisition which could in turn affect the degree of student academic achievement.

Self-efficacy, therefore, is not only a motivational construct but also a determinant of behavioural outcomes. The interrelationship between students' belief in their capabilities and the manner in which they approach learning activities can significantly influence their overall performance. According to Hayat, et al. (2020), beliefs about how capable someone is affects how they think by influencing their motivation and ability to manage themselves. Accordingly, students who believe in their capacity to understand and apply electrical and electrical and electronics technology concepts are more likely to engage meaningfully with course materials, persist through difficulties, and perform better academically.

The influence of self-efficacy on learning behaviour of electrical electronic students has been widely studied in the academic community. Various research studies have been conducted to determine the impact of self-efficacy on the learning outcomes of these students. One study by Smith, et al. (2023) found that students with higher levels of self-efficacy were more likely to engage in self-regulated learning behaviours. These behaviours include goal setting, self-monitoring, and self-reflection. This suggests that self-efficacy can positively influence the learning behaviours of electrical and electrical and electronics technology students. In another study by Hanham, et al. (2021), it was found that students with high self-efficacy were more likely to persevere through challenging tasks and were less likely to give up easily. This determination to succeed and overcome obstacles can greatly enhance the learning experience of these students. Furthermore, a study conducted by Triantoro (2013) showed that students with higher levels of self-efficacy performed better in academic tasks and achieved higher grades.

Invariably, an electrical and electronics technology student who have low self-efficacy may show less concern in terms of attitude and their behaviour to learning which may affect the level of their achievement. Consequently, this may also have implication on their competency level after graduation and they may not be employable or be self-employed not to talk of contributing positively to the society. The teaching and learning environment within technical and vocational education contexts like electrical technology can either strengthen or weaken self-efficacy beliefs. For instance, positive instructional feedback and successful hands-on experiences can encourage stronger self-efficacy and by extension, more productive learning behaviours (Wang, et al, 2025; Celestine, 2019). Conversely, repeated failures, lack of support, or overly complex learning tasks can diminish these beliefs, negatively affecting both learning engagement and academic performance.

Given the significance of these interrelations, it becomes imperative to investigate the influence of self-efficacy on the learning behaviours of electrical and electrical and electronics technology students. Such an inquiry will not only deepen the understanding of learner psychology in technical education but will also inform the development of instructional strategies and support systems that enhance students' confidence and academic outcomes. Hence, this study therefore, seeks to explore the various dimensions of self-efficacy such as academic self-efficacy, task-specific self-efficacy, and emotional self-regulation and how they contribute to the learning behaviours exhibited by students in the field of electrical and electrical and electronics technology education.

Objectives of the Study

The main goal of this study was to investigate how electrical and electrical and electronics technology students' self-efficacy influence their learning behaviour in universities in Southwest Nigeria. Specifically, the study investigated the:

1. relationship between self-efficacy and learning behaviour of electrical and electrical and electronics technology students in universities in southwest Nigeria.
2. influence of self-efficacy on learning behaviour of electrical and electrical and electronics technology students in universities in southwest Nigeria.

METHODS

This study employed correlational survey research design to investigate self-efficacy's influence on learning behaviour of electrical and electrical and electronics technology students in universities in Southwest Nigeria. Given the relationships, we proceed to examine the influence of self-efficacy on learning behaviour of electrical and electrical and electronics technology students

using linear regression analysis. The target population for the study comprised all third-year 158 electrical and electronics technology education students in South western part of Nigeria. There are five universities offering electrical and electronics technology education in southwestern part of Nigeria which constitutes the population of the study. The entire population of the study of 158 was used for the study because of the relatively small size which is manageable and accessible, hence total enumeration sampling technique was adopted for the study. Prior to data collection, approval was obtained from the Head of Department in each of the five Universities. The questionnaires were distributed among the students, and they were asked to answer the questions about self-efficacy and their learning behaviours.

Self-efficacy was measured using the Self-efficacy for Learning Performance (SLP) scale. It consists of eight items designed to evaluate participants' confidence in their capability to succeed in the course. The scale is on a seven-point response option, from 1 (not at all true of me) to 7 (very true of me). Learning Behaviour was measured using Students Learning Style Scale. The scale comprises 60 items assessing students' attitudes and feelings towards the courses they have taken thus far. Participants responded on a five-point Likert type scale format from 1 (strongly disagree) to 5 (strongly agree).

The instrument was validated by three experts, from the Department of Industrial Technical Education and department of Guidance and Counselling Psychology, Tai Solarin University of Education, Ijebu-ode Ogun State. The instrument was trial tested to determine its internal consistency; the result revealed a reliability coefficient of .71 and .78 for the two scales respectively. The researcher personally administered the instruments to the participants with the support of two research assistant, all questionnaires were duly retrieved. Data collected were analyzed using Pearson Product Moment Correlation (PPMC) and Regression analysis for testing the hypotheses at .05 level of significance with the use of SPSS software.

Results

Hypothesis 1: There is no significant relationship between self-efficacy and learning behaviour of electrical and electronics technology students in universities in southwest Nigeria.

Table 1: Relationship between Self-efficacy and Learning Behaviour of Electrical and Electronics Technology Students

Variables	M	SD	1	2
1. Self-efficacy	5.69	0.86	1	
2. Learning Behaviour	3.65	0.21	.520**	1

** . Correlation is significant at the 0.05 level (2-tailed).

Electrical and electronics technology students were surveyed about their self-efficacy ($M = 5.69$, $SD = .86$) and learning behaviour ($M = 3.65$, $SD = .21$). Table 1 above shows the relationship between electrical and electronics technology students' self-efficacy and learning behaviour. The table shows a moderate, positive relationship between electrical and electronics technology students' self-efficacy and learning behaviour ($r = .520$). The table further revealed that the relationship between electrical and electronics technology students' self-efficacy and learning behaviour is significant ($p < .05$). Thus, the null hypothesis was rejected. Hence, there is a significant relationship between self-efficacy and learning behaviour of electrical and electrical and electronics technology students in universities in Southwest Nigeria.

Hypothesis 2: There is no significant influence of self-efficacy on learning behaviour of electrical and electronics technology students in universities in southwest Nigeria.

Table 2: Linear Regression showing Influence of Self-efficacy on Learning Behaviour of Electrical and Electronics Technology Students

Sources of Variation	Sum of Squares	Df	Mean Square	F	Sig.	R	R ²	R ² (adj)
Regression	.117	3	.039	.843	.485	.293	.086	-.016
Residual	1.250	128	.046					
Total	1.367	131						

Table 2 shows a correlation coefficient (R) of .293 of self-efficacy on learning behaviour of electrical and electronics technology students in Southwest Nigeria. It reveals a multiple regression square (R²) of .086 and a linear regression square (R²) of -.016 (adjusted). It means that about 9% of the variance in learning behaviour of electrical and electronics technology students is explained by or can be predicted from self-efficacy. The observed F- ratio is .843, however, it is not statistically significant at .05 level (P > .05). The result shows that self-efficacy does not have significant influence on learning behaviour of electrical and electronics technology students. Therefore, there is no significant influence of self-efficacy on learning behaviour of electrical and electronics technology students in universities in Southwest Nigeria.

Discussion of Findings

In this study, the relationship and influence of self-efficacy on the learning behaviour of electrical and electrical and electronics technology education students was examined. Based on the regression analysis and the results, significant relationship was observed between variables. Hypothesis 1 stated that no significant relationship exists no significant relationship between self-efficacy and learning behaviour of electrical and electronics technology students. The result of the correlation does not support the hypothesis, showing a significant relationship between self-efficacy and the learning behaviour of electrical and electronics technology students. This implies that students who possess stronger beliefs in their ability to succeed academically are more likely to adopt positive learning behaviours such as persistence, effective time management, and self-regulated strategies. This finding aligns with Bandura (2014), who highlighted that self-efficacy plays a crucial role in determining which activities people choose, how much effort they put in, and how long they persist when facing difficulties. In the context of electrical and electronics technology education, where students are required to integrate both theoretical and hands-on problem-solving skills, such confidence is highly valuable. Similarly, the work of Hayat, et al. (2020), which reported a positive correlation between self-efficacy and learning behaviour, supports the current result.

Contrary to expectations, hypothesis 2 revealed that there is no significant influence of self-efficacy on learning behaviour of electrical and electrical and electronics technology students. While self-efficacy explained about 9% of the variance in learning behaviour, this proportion was not statistically meaningful, suggesting that other factors may exert stronger influence on students' learning behaviour. This is in alignment with the study of Yim (2023) who similarly reported that self-efficacy beliefs did not show a significant impact on learning behaviour in the context of Science, Technology, Engineering, and Mathematics education. Students with high self-efficacy did not consistently exhibit more active learning behaviours. One possible explanation is that

while students may believe in their ability to succeed, this belief alone may not translate into observable learning behaviours without the presence of other factors.

Conclusion

This study investigated the relationship and influence of self-efficacy on the learning behaviour of electrical and electronics technology education students in universities in Southwest Nigeria. The results showed a strong and positive correlation between self-efficacy and learning behaviour. This indicates that students who believe in their academic capabilities are more likely to adopt positive and productive learning behaviours. However, regression analysis showed that self-efficacy did not significantly influence learning behaviour, suggesting that confidence in one's ability, while important, is not sufficient on its own to predict actual learning behaviours among students. This suggests that self-efficacy may function more as a facilitating condition rather than a direct determinant of behaviour.

Based on these findings, it can be concluded that promoting students' self-efficacy is valuable, but efforts to improve learning behaviours must also address broader factors within technical education programmes. Factors such as enhancing practical facilities, promoting collaborative learning environments, and providing consistent feedback may help bridge the gap between students' self-beliefs and their observable learning behaviours. Future research can explore mediating and moderating variables such as resilience or learning environment that may strengthen the pathway between self-efficacy and learning behaviour.

In essence, for electrical and electronics technology education to effectively produce competent graduates who can thrive in today's complex and technical world of work, both individual psychological constructs like self-efficacy and other variables within the learning environment should be deliberately addressed.

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