



RELATIONSHIP BETWEEN STUDENTS' ACADEMIC SELF-EFFICACY AND ACADEMIC ACHIEVEMENT IN SELECTED POLYTECHNICS IN NIGERIA

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ABSTRACT

This study finds out the relationship between students' academic self-efficacy and academic achievement in selected polytechnics in Nigeria. A descriptive survey method was used. The population for the study consisted of Chief lecturers and final year students of selected polytechnics in Nigeria. Out of a total population of 623 HND II Polytechnic students of the selected polytechnics in Nigeria, 271 were involved. Out of a total population of 168 chief lecturers, 109 of them were involved in the study. This brings the total number of participants to 380. Krejcie & Morgan sample size table cited in Ogbu, (2010) was used to determine the representativeness of the sample frame. Purposive sampling method was used in selecting the participants from the two population groups. The primary instrument was Likert Scale questionnaire. It is tagged Students' Self-efficacy and Academic Achievement Questionnaire (SSEAAQ). The four null hypotheses were tested using chi square test at 5% level of significance and appropriate degree of freedom. Research results showed that there is a significant positive relationship between academic self-efficacy- and cognitive engagement of polytechnic students. And that there is a significant positive relationship between academic self-efficacy and academic achievement of polytechnic students in selected polytechnics in Nigeria. And also that there is a significant positive relationship between deep processing and academic achievement of polytechnic students in selected polytechnics in Nigeria. And lastly that there is significant positive relationship between persistence and academic achievement of polytechnic students in selected polytechnics in Nigeria. It was recommended among others that polytechnic lecturers should formulate programs and activities that will develop and maintain self-efficacy among students, develop activities that will also boost their cognitive engagement and interest in their studies. And that polytechnic lecturers should set high standard, aspirations and expectations for students by evolving programs aimed at encouraging and boosting student's confidence to enhance their academic achievement.

KEY WORDS: *Academic, Self-efficacy, Academic self-efficacy, Achievement, Academic achievement*

INTRODUCTION

Receiving a quality education is an important cornerstone in achieving the general objective of polytechnic education which involves promoting vocational and technical education and development, technology transfer, and skill development which are the key goals of polytechnic education, which will help the nation's socioeconomic development. Polytechnic education in Nigeria aims at providing technical and practical-oriented training to meet the manpower requirements for the industrial, agriculture, commercial and economic development of Nigeria.

To achieve the lofty objective of polytechnic education in Nigeria, it is imperative that polytechnic students have the tools they need to be successful, tools that include self-efficacy and motivation. For some polytechnic students however, motivation is not always intrinsic. Research has indicated that the relationship between students' self-efficacy and academic

achievement is an important factor in the educational sector (Hanre & Pianta, 2021). In fact, one of the most powerful weapons that polytechnic students should strive to develop in order to effectively acquire vocational and technical skills is confidence, determination and the spirit of perseverance which are elements of self-efficacy. Students who tend to lack such attributes may likely have little or no interest in sustained academic pursuit which certainly affects better achievement outcomes (Fan & Williams; Hanre & Pianta, 2021).

Polytechnic students' academic activities and achievements, like those of all other students, tend to increase by their self-efficacy. This submission has been confirmed by Zimmerman, Bandura and Martinez-Pons, (1992), that academic achievement involves self-efficacy belief of students, which can regulate their learning. Additionally, the learning environment plays a significant role in heightening and maintaining student self-efficacy and interest in academic activities. When students feel a sense of control and



security in the classroom, they are more engaged because they approach learning with enthusiasm and vigour and become active participants in their own education (Baker, Grant & Morlock, 2018).

The lack of academic achievement among polytechnic students is ubiquitous. There are numerous reasons why Nigerian polytechnic students may lose interest in school, and self-efficacy is one of the key factors. Considering that students spend about twenty-five percent of their waking hours in a classroom, it is essential that polytechnic students have a strong confidence in themselves and high spirit of I-can-do-it. This creates a problem for both the teacher and the student. Throughout an average school day, teachers frequently overhear students complaining about an assignment, a class, or even a teacher. If students have positive relationships with their teachers, they will be more engaged and thus more motivated throughout each of their classes. Consequently, the relationship between polytechnic students' academic self-efficacy and academic achievement in selected polytechnics in Nigeria is the thrust of this study.

Problem Statement

Regardless of a student's actual ability, self-confidence form certain expectations for the students based on a number of variables. It is apparent that some polytechnic students possess the necessary skills and ability to cope with the rigours of academic activities but lack the confidence in themselves. Some students tend to lack the believe in their capabilities to organize and execute the courses of action required to manage prospective situations. Such lack of self-confidence and disbelief could undermine the student's determination and perseverance.

Some polytechnic students have apparently failed examinations, performed poorly, or withdrawn even though they have high IQ and all the necessary attributes needed for academic achievement. This is quite worrisome as one wonders if poor academic self-efficacy has any bearing with students' cognitive engagement, academic achievement, deep processing, and persistence towards success. This is what the study is out to find out in order to make appropriate recommendations that will help to achieve the objectives of polytechnic education in Nigeria.

Research Hypotheses

The following null hypotheses are generated and will be tested at 0.05 level of significance:

Ho1: There is no significant relationship between academic self-efficacy and cognitive engagement of polytechnic students in selected polytechnics in Nigeria.

Ho2: There is no significant relationship between academic self-efficacy and academic achievement of polytechnic students in selected polytechnics in Nigeria.

Ho3: There is no significant relationship between deep processing and academic achievement of polytechnic students in selected polytechnics in Nigeria.

Ho4: There is no significant relationship between persistence and academic achievement of polytechnic students in selected polytechnics in Nigeria.

LITERATURE REVIEW

The Meaning of Self Efficacy

Self-efficacy refers to people's judgments about their capability to perform particular tasks. Task-related self-efficacy increases the effort and persistence towards challenging tasks; therefore, increasing the likelihood that they will be completed. Self-efficacy beliefs are an important aspect of human motivation and behavior as well as influence the actions that can affect one's life. Regarding self-efficacy, Bandura (1995) explains that it refers to beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations. More simply, self-efficacy is what an individual believes he or she can accomplish using his or skills under certain conditions (Pajares, 2019).

According to Bandura cited in Hanre and Pianta, (2021), self-efficacy affects both learning and performance in students in the following ways:

- i) It affects the goals that students choose. For example, students with low levels of self-efficacy are more likely to set lower goals for themselves than students with higher self-efficacy.
- ii) It impacts learning as well as the efforts students exert on the task at hand. For instance, when students have high self-efficacy, they are more likely to work harder to learn a new task as they will be more confidence than a student with low self-efficacy.
- iii) It influences the persistence for which a student will attempt to learn a new and difficult task. Students who are high in self-efficacy are thought to be more confident and therefore will persist in their efforts when learning a new task even when encountering a problem. The present study is anchored on this theory.

The Meaning of Academic Self-Efficacy

Self-efficacy, also called perceived ability, according to Zimmerman, Bandura and Martinez-Pons (1992), refers to as the component of self-concept that concerns individual beliefs in their capabilities and competencies to handle a given task. If learners possess the ability to successfully perform task, then that task will be attempted. The task will be avoided if it is perceived to be too difficult. Although inefficacious individuals usually avoid challenging tasks, when they do attempt them, they give up more easily than individuals with high efficacy. When inefficacious individuals fail, they attribute the unsuccessful result to a lack of ability and tend to lose faith in their capabilities. When they succeed, they are more likely to attribute their success to external factors. If students master a challenging task with limited assistance, their levels of self-efficacy rise.

Individuals who possess a high degree of self-efficacy are more likely to attempt challenging tasks, to persist longer at them, and



to exert more effort in the process. If highly efficacious individuals fail, they attribute the outcome to a lack of effort or an adverse environment. When they succeed, they credit their achievement to their abilities. It is the perception that their abilities caused the achievement that affects the outcome rather than their actual abilities. Four factors determine self-efficacy: enactive mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states (Bronfenbrenner & Bronfenbrenner, 2015).

The Meaning of Academic Achievement

Orth, Robins and Widaman (2012) defined academic achievement as the extent to which a student, teacher or institution has achieved their educational goals. Therefore, academic achievement is an outcome of education which has a special importance, for the students, teacher, institutions, and the people around the student as well as the attainment of success of a student in his/her school work among his classmates. Academic achievement, which is measured by examination results, is one of the major goals of a school. Schools are established with the aim of imparting knowledge and skills to those who go through them.

In their own contribution, Alexander, Entwisle and Horsey (2017), view academic achievement as the level of performance in a particular field of study, whereby higher scores indicate better achievement and lower scores reveals poor achievement. Academic achievement could also be seen as an end product of learning. Academic performance is affected by various conditions existing at the time of learning as well as the conditions intervening between learning and use (Cataldi, Laird, & Kewalramani, 2019). Croninger and Lee (2011) explained that the term academic achievement refers to the performance or accomplishment of students in academics or learning task. It is used to indicate the degree of success attained in some general or specific area of academic task. In other words, academic achievement is an educational outcome of students learning at the end of a course.

Theoretical Framework

Self-efficacy Theory

Self-efficacy was developed by Albert Bandura as part of a larger theory i.e the Social Learning Theory which has progressed into the Social Cognitive Theory (Wentzel, 2013). In these two theories, the role of cognition in motivation and the role of the situation are largely ignored. According to Bandura cited in Wentzel, (2013), Social Cognitive Theory takes on an agent-like perspective to change, development and adaptation. Bandura describes an agent as someone who intentionally influences one's functioning and life circumstances. In this view, people are self-organizing, proactive, self-regulating, and self-reflecting. They are contributors to their life circumstances not just products of them.

The Self-system Model

The self-system processes model helps to explain the mechanism by which the social environment of a school influences student

self-efficacy, academic engagement and academic achievement. The essence of socialization is to develop self-regulation of one's own behavior (Baker, Grant & Morlock, 2018). In the development of self-regulation, it is important to help children internalize the values and rules of the society. It is believed that children are more likely to internalize and adopt values and rules when their relationships with the socialization agents are nurturing and supportive (Dika & Singh 2020).

Self-determination Theory (SDT)

According to the tenets of self-determination theory (SDT) as propounded by Hughes, Cavel and Willson (2020), social contexts that support an individual's psychological needs (i.e., competence, relatedness, and autonomy) promote motivated actions by facilitating the internalization of extrinsic motivation. There is an important distinction between motivation, self-efficacy and engagement. If to be motivated" is to be moved to do something, then to be engaged is to do something in a broader sense. Despite the distinction, the theory facilitates an understanding of the reasons behind student engagement. Support for the psychological needs of human beings (i.e., competence, relatedness, and autonomy) is critical in internalizing extrinsic motivation as well as maintaining intrinsic motivation. In other words, the primary reason that people are willing to do uninteresting activities is that these activities are valued by significant others with whom they feel connected or have a sense of relatedness.

Relationship between Self-Efficacy and Academic Achievement

A huge amount of research has attempted to identify important factors to student success by assessing the relations among many psychological and academic variables. Few studies have used different methods to propose and test models that can be used to understand the relations among factors that influence student academic success (O'Connor, Dearing & Collins, 2011). Education has a broad aim of preparing students for useful living within the society and developing in students' skills and knowledge that would make them function effectively in the society.

In his opinion, Wentzel (2012) sees education as a means that supplies people with specific skills and therefore it enables them to perform their tasks effectively. Wentzel further stressed that the better the performance of an individual is the more competitive and rewarded the individual is the more competitive and rewarded the individual will be. Many factors have greatly influenced academic achievement of individuals. Researchers like Ryan, Stiller, and Lynch (2014) explain that attitude leads to achievement and abilities are needed for successful performance. Similarly, Wentzel (2013) confirmed that intellectual capability, and motivation are significant factors on academic performance. Self-efficacy refers to personal confidence in one's abilities for a successful accomplishment of a certain task as Murray and Malmgren, (2015) put it. Murray and Malmgren, (2015) concluded that self-efficacy influences behavior, choice and commitment in



a task, the energy spent in performing it, and the level of the performance.

METHODOLOGY

The study utilized the descriptive survey method. The population for the study consisted of Chief lecturers of selected polytechnics in Nigeria totaling and final year students. The names of the polytechnics selected are Akanu Ibiam Federal Polytechnic, Unwana, Ebonyi State; Auchu Polytechnic, Edo State; Federal Polytechnic Bauchi; Federal Polytechnic, Daura, Katsina State, Federal Polytechnic Kaura Namoda, Zamfara State; Federal Polytechnic, Nekede, Imo State; Kaduna Polytechnic, Kaduna; Yaba College of Technology, Lagos State; Airforce Institute of Technology, Kaduna.

Out of a total population of 623 HND II Polytechnic students of the selected polytechnics in Nigeria, 271 were involved. Out of a total population of 168 chief lecturers, 109 of them were involved in the study. This brings the total number of participants to 380. Krejcie & Morgan sample size table cited in Ogbu, (2010) was used to determine the representativeness of the sample frame (see appendix III). Purposive sampling method was used in selecting the participants from the two population groups. In applying it, lecturers teaching HND II students and all the HND II students were involved because, as HND II lecturers, they are aware of the To test null hypothesis 1, correlation analysis using Pearson's r was used. The result is presented in table 1:

academic self-efficacy of the students and how it relates to the students' academic achievement, and as HND II students in their final year, they have the knowledge and awareness of their academic self-efficacy and the relationship between that and their academic achievements.

The primary instrument was the questionnaire. The questionnaire was a Likert five-point scale questionnaire of Strongly agree, Agree, Undecided, Disagree and Strongly disagree which was developed by the researcher. It is tagged Students' Self-efficacy and Academic Achievement Questionnaire (SSEAAQ). It was validated by experts in the field. Pilot test was used to establish its reliability.

Frequency counts and simple percentages were used to determine the responses of the respondents on their personal data while mean was used to analyze the data emanating from the research questions. The hypotheses were tested using chi square test at 5% level of significance and appropriate degree of freedom.

RESULTS AND DISCUSSION

Hypotheses Testing

Hypothesis 1: There is no significant relationship between academic self-efficacy and cognitive engagement of polytechnic students in selected polytechnics in Nigeria.

Table 1: Person Moment Correlation Analysis on the Relationship between Academic Self-efficacy and Cognitive Engagement of Polytechnic Students in selected Polytechnics in Nigeria.

Source	N	Mean	SD	df	r	p
Academic self-efficacy	380	82.286	12.929	378	.518"	.000
Cognitive Engagement	380	111.236	13.553			

**-. Correlation is significant at the 0.05 level (2-tailed). $r^2 = .268$

The result of the Pearson correlation analysis in table 1 showed that there is significant positive relationship between academic self-efficacy and cognitive engagement of polytechnic students in selected polytechnics in Nigeria reason being that the p value of 0.000 is lower than the 0.05 alpha level of significance while the r value of .518 ($r = .518, p = .000$) at 378 df. The r^2 statistic for this relationship is .268 which suggests that 26.8% of variance in student's academic self-efficacy can be accounted for by cognitive engagement. Therefore, the null hypothesis which stated that

there was no significant relationship between academic self-efficacy and cognitive engagement of polytechnic students in selected polytechnics in Nigeria is rejected.

Hypothesis 2: There is no significant relationship between academic self-efficacy and academic achievement of polytechnic students in selected polytechnics in Nigeria.

To test null hypothesis 2, correlation analysis using Pearson's r was used. The result is presented in table 2:

Table 2: Person Moment Correlation Analysis on the Relationship between Academic Self-efficacy and Academic Achievement of Polytechnic Students in selected Polytechnics in Nigeria.

Source	N	Mean	SD	df	r	p
Academic self-efficacy	380	82.286	12.929	378	.564"	.000
Cognitive Engagement	380	44.092	4.759			

**-. Correlation is significant at the 0.05 level (2-tailed). $r^2 = .318$



The result of the Pearson correlation analysis in table 2 on the relationship between Academic Self-efficacy and Academic Achievement showed that there is a significant positive relationship between Academic Self-efficacy and Academic Achievement of polytechnic students in selected polytechnics in Nigeria. The outcome shows that the p value of 0.000 is lower than the 0.05 alpha level of significance while the r value of .564 ($r=.564, p=.000$) at 378 df. The r^2 statistic for this relationship is .318, which suggests that 31.8% of variance in student's academic achievement can be accounted for by student's

academic self-efficacy. Therefore, the null hypothesis which stated that there was no significant relationship between academic self-efficacy and academic achievement of polytechnic students in selected polytechnics in Nigeria is rejected.

Hypothesis 3 :There is no significant relationship between deep processing and academic achievement of polytechnic students in selected polytechnics in Nigeria.

To test null hypothesis 3, correlation analysis using Pearson's r was also used. The result is presented in table 3:

Table 3: Person Moment Correlation Analysis on the Relationship between deep processing and academic achievement of Polytechnic Students in selected Polytechnics in Nigeria

Source	N	Mean	SD	Df	r	p
Deep Processing	380	18.728	4.054	378	.434**	.000
Academic Achievement	380	44.092	4.759			

** - Correlation is significant at the 0.05 level (2-tailed). $r^2 = .206$

The outcome of the Pearson correlation analysis in table 3 on the relationship between deep processing and academic achievement showed that there is a significant positive relationship between deep processing and academic achievement of polytechnic students in selected polytechnics in Nigeria. The p value of 0.000 is lower than 0.05 alpha level of significance while r value of .454 ($r = .454, p=.000$) at 378 df. The r^2 statistic for this relationship is .206, which suggests that 20.6% of variance in student's academic achievement can be accounted for by student's deep processing of information. Therefore, the null hypothesis which stated that there was no significant relationship between deep processing and

academic achievement of polytechnic students in selected polytechnics in Nigeria is rejected.

Hypothesis 4: There is no significant relationship between persistence and academic achievement of polytechnic students in selected polytechnics in Nigeria.

To test null hypothesis 4, correlation analysis using Pearson's r was also used. The result is presented in table 4.

Table 4: Person Moment Correlation Analysis on the Relationship between Persistence and Academic Achievement of Polytechnic Students in selected Polytechnics in Nigeria.

Source	N	Mean	SD	Df	r	p
Persistence	380	24.152	5.247	378	.211**	.000
Academic Achievement	380	44.092	4.759			

** - Correlation is significant at the 0.05 level (2-tailed). $r^2 = .044$

The result of the Pearson correlation analysis in table 4 on the relationship between persistence and academic achievement showed that there is significant positive relationship between persistence and academic achievement of polytechnic students in selected polytechnics in Nigeria because the p value of 0.000 is lower than the 0.05 alpha level significance while the r value of .211 ($r=.211, p=.000$). The r^2 statistic for this relationship is .044, which suggests that 4.04% of variance in student's academic achievement can be accounted for by student's persistence. Therefore, the null hypothesis which stated that there was no significant relationship between persistence and academic achievement of polytechnic students in selected polytechnics in Nigeria is rejected.

CONCLUSION

By way of conclusion, there is a significant positive relationship between academic self-efficacy and cognitive engagement, between academic self-efficacy and academic achievement, between deep processing and academic achievement and between persistence and academic achievement of polytechnic students as indicated by the responses of lecturers and students of the selected polytechnics in Nigeria. It is thus important that these variables are enhanced among polytechnic students as much as possible.

DISCUSSION

The study finds a significant positive relationship between academic self-efficacy- and cognitive engagement of polytechnic



students ($r = .518, p = .000$). This result corroborates previous findings by Arabzadeh, Shafy Nadery, Salami and Bayanati (2012) in their study on the effects of teaching self-efficacy on students' cognitive engagement. It was reported that teaching of self-efficacy has had a significant effect on student cognitive engagement. Teaching self-efficacy enables the students to positively employ cognitive strategies and to guide their own learning. Similarly, research by Akomolafe, Ogunmakin, and Fasooto (2013) on the role of academic self-efficacy, academic motivation and academic self-concept in predicting secondary school students' academic engagement demonstrates that academic self-efficacy, academic motivation and academic self-concept significantly predicted students' academic engagement and performance ($r = 0.72, \sim\text{adjusted} = 0.56$). The result also showed that 56% of the variance in the academic engagement of secondary school students was accounted for by the linear combination of the three variables. In terms of the magnitude of contribution, academic self-efficacy made the most significant contribution to academic engagement followed by academic self-concept and academic motivation respectively.

Findings also show a significant positive relationship between academic self-efficacy and academic achievement of polytechnic students ($r = .564, P = .000$). The present finding is in corroboration of Tenaw (2013) who investigated the level of students' self-efficacy, gender difference in self-efficacy and achievement and also relationships between self-efficacy and achievement for second year students in the fall of 2013 in Analytical Chemistry I (ACI) at DebreMarkos College of Teacher Education (DMCTE). The study indicated that students' level of self-efficacy is medium (50.08), and there is a statistically significant relationship between self-efficacy and achievement ($r = 0.385, p = 0.01$).

It was also found out that there is a significant positive relationship between deep processing and academic achievement of polytechnic students ($r = .454, p = .000$). This finding is in line with previous researches which consistently found that deep (meaningful) processing strategies leads to greater performance on achievement measures over the materials studied than shallow strategies. Student's academic achievement is therefore, positively influenced by their cognitive strategies they employ to guide their learning (Garcia & Pintrich, 1994; Greene & Miller, 1996; Kardash and & Amlund, 1991; Miller, Greene, Montako, Ravindran, & Nicholls, 1996; Atherton, 2011; Pintrich & Garcia, 1991; Abbing, 2013).

The study also found a significant positive relationship between persistence and academic achievement of polytechnic students ($r = .211, p = .000$). This finding is in line with other researchers' view who more recently, studied aspects of cognitive engagement, such as students' investment in learning, perseverance in the face of challenges; and use of deep rather than superficial strategies. They concluded that students who are cognitively and behaviorally engaged will attend to the task at hand and simultaneously manage their learning like thinking

about similar tasks they have done, realizing when they need to ask for help, using problem-solving strategies (Pintrich & DeGroot 1990; Miller et al 1996; Abbing 2013; Wang & Eccles 2013)..

RECOMMENDATIONS

The following recommendations are made based on the findings of the study;

1. Since it was found out that academic self-efficacy was positively and significantly related to students' cognitive engagement, polytechnic lecturers should formulate programs and activities that will develop and maintain self-efficacy among students, develop activities that will also boost their cognitive engagement and interest in their studies.
2. Findings of the study proved that academic achievement was positively and significantly related to students' academic self-efficacy. Polytechnic lecturers are thus implored to set high standard, aspirations and expectations for students by evolving programs aimed at encouraging and boosting student's confidence to enhance their academic achievement. This should be done, by formulating realistic, specific measurable and relevant educational goals for student's environment to build their effort, confidence, and general academic achievement.
3. The findings of the study proved that cognitive engagement was positively and significantly related to students' academic achievement. Consequently, students should be encouraged by their lecturers and parents to be meaningfully engaged in learning activities through interactions with others and worthwhile tasks.
4. Deep processing of information has been found to help students acquire and retain information needed for a successful academic activity in the classroom. It is therefore recommended that lecturers should engage students in tasking classroom activities like problem solving which will encourage deep processing of information and consequently enhance academic achievement.
5. Since persistence was found to correlate with students' academic achievement, lecturers and parents should encourage their wards to persist even when faced with daunting academic challenges or failure. This can be done by the National Board for Technical Education (NBTE) to introduce parents-educational programs in polytechnics to improve parent's involvement in the educative process of their children for better academic achievement.
6. Although students' who cognitively process information in a shallow manner reported good level of academic self-efficacy, it is recommended that psychologists and counsellors should create awareness, educate, sensitized and encourage polytechnic students to process information deeply which would help not only for the sake of writing and passing exams but for long term memory retention.
7. Since processing information in a deep manner enhances good academic performance in school in contrast to



shallow processing, efforts should be made by lecturers to encourage deep cognitive processing more than rote learning.

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