African Research Review

An International Multi-Disciplinary Journal, Ethiopia
Vol. 5 (1), Serial No. 18, January, 2011
ISSN 1994-9057 (Print) ISSN 2070-0083 (Online)

Self-Concept and Secondary School Students' Academic Achievement in Physics *(Pp. 365-371)*

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Abstract
The purpose of this research was to investigate the influence of self concept on physics students' academic achievement in secondary schools. The study was conducted in Uyo LGA of Akwa Ibom State in Nigeria. A sample size of five hundred (500) senior secondary two physics students took part in the investigation. Two researcher made instruments, Self-concept Questionnaire (SQ) and Physics Achievement Test (PAT) were used in generating the data for the study. The reliability of the instruments determined using Cronbach Alpha were 0.77 for SQ and 0.72 for PAT. Two hypotheses were proposed to guide the investigation and the data that accrued from the study were analysed using independent t-test. The major findings of the study showed that students with high self-concept achieved academically higher than those with low self-concept. Gender showed no significant difference in academic achievement of physics students with high self-concept. It was therefore recommended that curriculum designers and implementation agents should consider self-concept as a variable that enhances secondary students' academic achievement.

Introduction

The way an individual perceives himself influences the way he behaves in interaction with his physical and social environment, (Barbara, 2000). In other words, a person's action is the outcome of the picture the person has of himself, his understanding of his abilities, capabilities, interest, values,

achievements, needs as well as his limitations. Thus, a student who believes he cannot perform well in a particular school subject may not have much interest in the subject and will not put in much effort on the study of that subject as he would have in others. This agrees with Purkey (2000) who argues that the motive behind all behaviours is self. He also contends that people are constantly trying to behave in a manner which is consistent with the way they view themselves.

Self-confidence and self-concept are required for a person to achieve success in all human endeavours. According to Asagwara (1999), one has to experience within oneself some feeling of capability and self trust to enable the person participate actively and efficiently in whatever one engages oneself. This view is in line with Okafor (2000) who refers to self-concept as the individual's comprehensive evaluation of himself in terms of his abilities, attitudes, judgements and values, stressing further that if a student perceives himself as an academic failure his effort in study is affected disastrously. Where he perceives himself as successful, this will affect his efforts in his academic work. This implies that attempt should therefore be made by each student to dwell more on his success than on his failure. Students progress significantly in academic work when they are obsessed with positive and encouraging thought of themselves. This discussion seems to highlight self-concept as a variable that has link with academic achievement of students. This provides a gap that this research seeks to fill empirically.

Statement of Problem

The way an individual perceives himself influences the way he behaves in interaction with his physical and social environment (Babara, 2000). This statement creates a gap for this study to provide empirical data on the influence of self-concept on academic achievement of physics students.

Research Questions

1. Does self-concept have any significant influence on academic achievement of physics students?
2. Is there any significant difference in academic achievement between male and female physics students with high self-concept?

Research Hypotheses

The following research hypotheses were posed to guide the investigation:

1. There is no significant influence of self-concept on academic achievement of physics students.

2. There is no significant difference in academic achievement between male and female physics students with high self-concept.

Purpose of the Study

The purpose of this study is to find out whether there is any significant influence of:

(a) Self-concept on physics students' academic achievement.

(b) Self-concept on female physics students' academic achievement; and

(c) Self-concept on male physics students' academic achievement.

Significance of the Study

The findings of this study are to provide curriculum development and implementation bodies information that is relevant to high academic achievement of physics students in secondary schools. The results of the research are also to sensitize parents on the necessity of building into their children high self-concept through child-rearing practices.

Methodology

The design for the study was the survey method which used questionnaire and achievement test in physics.

The study area of this research was Uyo Local Government Area of Akwa Ibom State in Nigeria. Uyo is the Capital City of Akwa Ibom State. The Uyo Local Government Area shares boundary with Itu Local Government Area on the North, Etinan and Oron Local Government Areas on the South, Abak and Ukanafun Local Government Areas on the west and Cross River State of Nigeria on the East. It has an estimated population of about 1.5 million people and geographical area of about 914,309 square kilometers. The major occupation of Uyo people is trading. It is a commercial nerve centre of the Akwa Ibom State. The local government has tourist attraction areas and a university.

The population size for the study was all Senior Secondary two (SS2) physics students from the nine secondary schools in Uyo Local Government Area. This gave an estimate population size of about seven hundred and fifty senior secondary two physics students.

Criterion sampling technique was used in choosing schools that took part in the research. The criteria used were schools that are co-educational and have

taught the physics concepts selected for the study. The sample size of the study was five hundred (500) senior secondary two physics students randomly drawn from the seven schools that met the criteria.

Two researcher-made instruments were used in generating the data for the work. These were Self-concept Questionnaire (SQ) and physics Achievement Test (PAT). Self-concept questionnaire was a twenty-five item questionnaire designed to measure four dimensions of self-concept namely: identify self items, self-concept of social adjustment, self-concept of academic ability and ideal self items. The Physics Achievement Test was a fifty multiple choice questions drawn from the selected physics concepts: types of motion, simple machine, moment, motion, elasticity and simple harmonic motion.

The self-concept questionnaire was scored using the four-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Strongly Agree was scored four points, Agree was scored 3 points, Disagree was scored 2 points and Strongly Disagree was scored one point. The maximum score on this questionnaire was 100% while the minimum score was 25%. Respondents who scored 50% and above were regarded as respondents with high self-concept while those who scored below 50% were regarded as respondents with low self-concept. Each correctly answered multiple choice question in Physics Achievement Test (PAT) was scored two marks.

The two instruments, SQ and PAT were given face-validation by three and two experienced experts in Child Psychology and physics education respectively. The instruments were therefore trial-tested on thirty SS2 physics students randomly drawn from two schools who met the criteria but were not part of the study sample. The reliability coefficients of the tests determined using Cronbach Alpha were 0.77 for SQ and 0.72 for PAT.

The two research instruments were administered on the respondents on the same day in their school setting. The respondents were properly guided on how to respond to the two instruments, especially self-concept questionnaire.

The data that accrued in the study were analysed using t-test at .05 significant level.

Research Findings

Hypothesis One: This hypothesis states that *there is no significant influence of self-concept on academic achievement of physics students*.

The analysis in Table 1 shows that the calculated t-value of 4.28 is greater than the critical t-value of 1.98 for a df of 498 at $p < .05$. Hence, the null hypothesis one which states that there is no significant influence of self-concept on academic achievement of physics students was therefore rejected. This means that self-concept is a significant factor that influences students' academic achievement in physics.

Hypothesis Two

This hypothesis states that there is no significant difference in academic achievement between male physics students with high self-concept and their female counterparts.

The analysis in Table 2 shows that the calculated t-value of 0.29 is less than the critical t-value of 1.98 for a df of 282 at $p < .05$. Thus, the null hypothesis two which states that there is no significant difference in academic achievement of male and female physics students with high self-concept was up held.

Discussion

The results in Table 1 show that physics students with high self-concept achieved higher academically than their counterparts with low self-concept. This observation of influence of self-concept on academic achievement corroborates with those of Babara (2000) and Purkey (2000) who stated that self-concept and self-confidence are required for a person to achieve success in all human endeavours. Students with high self-concept believe they can perform well in school subjects and therefore put in much effort in the study of those subjects. The gender of students with high self-concept showed no significant difference in the study, Table 2. This means male physics students with high self-concept are not academically superior to their female counterparts. This is because female physics students have been able to level up in the way they perceive about themselves which therefore enhances their interaction mode with physical and social environments. This is in support of the work done by Okafor (2000).

Conclusion and Recommendation

The study was on influence of self-concept on academic achievement of physics students' in secondary schools. Major findings of the study showed that:

(a) Self-concept significantly influences academic achievement of physics students.

(b) Gender of students with high self-concept showed no significant influence on academic achievement of physics students.

In view of the findings of the study, it is therefore recommended that parents should help their children to develop self-concept by giving them parental care, affection and encouragement. They should provide reinforcements like praise and more identification of themselves with the children. A further recommendation is that curriculum designers and implementation agents should consider learners' self-concept as a factor that enhances academic achievement.

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Table 1: t-test comparison of the achievement scores of physics students with high and low self-concept

Self-concept	N	X	SD	df	t-cal	t-crit	Decision at .05
High versus Low	284	37.93	10.20	498	4.28	1.98	*
	216	34.07	9.84				

* = Significant

Table 2: t-test comparison of academic achievement of male and female physics students with high self-concept

High self-concept	N	SD	df	$\overline{X}$	t-cal	t-crit	Decision at .05
Male	164	12.91		40.16			
versus			282		0.29	1.98	NS
Female							
	120	7.26		37.36			

NS = Not significant