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The Effect of Students' Achievement Motivation on their Cognitive Performance Behaviour

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Abstract
This has been an attempt to investigate the effect of achievement motivation on students cognitive activities. In the study, 200 SS II students were selected by stratified random sampling as participants. Achievement Motivation Scale, a 30-item multiple choice questions in chemistry (compiled from past General Certificate Education of Certificate Examination and Senior Secondary School Certificate Examination and a 25-item Attitude Scale for Chemistry were the instruments used to collect data. All the three instruments were validated through pilot study. Three Research Hypotheses were stated to guide the research. Pearson product Moment Corrleation Statistics was used to analyze data. It was found that both the Achievement Motivation Scale scores, the attitude scale scores and student perception of the teaching method scores show significant correlation to students academic achievement in chemistry. Theories of Achievement Motivation and behaviour modification were used to explain the findings from the study. Based on the findings, recommendation were made.

Keywords: Achievement Motivation; cognitive performance.

Introduction

The student classroom learning outcomes can be inferred from changes in their behaviour. There are some variables that influence these behaviour changes. Such variables include meaningfulness, reinforcement, imagery and elaboration, similarity, contiguity, motivational and achievement-motivation. Meaningfulness has traditionally been personally defined as the number of different associations a particular word or item aroused in an individual.

The greater the number of associations elicited by a particular word, the more meaningfulness the word is said to be. Take for example, a two-syllable pseudo word such as "gojey" or "geglum" will elicit, on the average, only one word from the student, during a one-minute test period, whereas a two-syllable word such as "money" or "Army" will elicit about nine words (Noble, 1952). Therefore, the more meaningfulness something is to a student, the more the things it will make us think of. Imagery and elaboration as variables influencing learning demonstrates that the more concrete the item is, the more it is recalled. As far as

similarity is concerned there are about three types of these similarities: formal, meaningful and conceptual.

Formal similarity refers to similarity among physical characteristics of the material for examples XYZ as against XBY. Meaningful similarity refers to situations in which the components of the material are related in meaningful, although not conceptual, ways. For example, "elated", "laughing" and "happy". Conceptual similarity refers to conceptual relationships present in the material to be learnt. For example, "white, black, yellow, window, door, ceiling". Each of the examples given can be said to be high in formal, meaningful and conceptual, conceptual similarities, respectively.

In formal similarity, high formal similarity among the items to be learnt results in slower learning than low formal similarity. This is also true with the meaningful similarity. But in the case of conceptual similarity, the reverse is the case (Stimmel & Stimmel, 1968). Therefore, high conceptual similarity facilities performance.

Contiguity refers to interval between two events, and specifically refers to interval between two events, in time and space of those two events. In other words, inorder for learning to occur, certain temporal relationships must exist between various events, for example, the use and timing of teaching aids or models in learning situations (Ilogu, 2000).

Motivation on the other hand, deals with the dynamic changes within the individual that bring about his motives to ensure the achievement of a set goal (Ilogu, 2005). Therefore, motivation, just like learning, manifests in behaviour of the individual which we can then observe (Ilogu, 2000).

Similar to motivation is the achievement-motivation. McClelland and his colleagues (1953) initiated research into achievement motivation. Achievement-motivation refers to a pattern of actions and feelings connected with striving to achieve some internalized level of excellence in performance (Ilogu, 2005). Achievement-motivation, is a non-conscious process, in which a decision to act or not to act, is made (Atkinson & Freather 1966). Some students have a need to achieve in all that they do. Their desire for success drives them to accomplish every task, no matter what the task is, or the difficulties involved in completing it. In terms of all the variables so far discussed above, classroom learning is not the only situation where a behaviour change is observed. Changes in behaviour also occurs in behaviour modification, for example, rational emotive behaviour therapy, extinction and achievement motivation efforts. Therefore, the variables discussed above can also influence the manifestation of other behaviours in non-classroom settings. Hence a thorough discussion of these variables is necessary as they can occur anytime and any where not necessarily in the classroom situations.

The concept of achievement motivation may not be fully understood either by the teachers, the students, employees or the employers. As a result of this, the workers productivity in

industries and students performance in schools may decline because achievement-motivation intervention is not available for them.

In support of this assertion, achievement motivation theorists and researchers have put forward achievement-motivation model which embodies the Achievement Motive Approach and the Achievement Goal Approach. The Achievement Motive Approach includes need or drive for achievement and the fear of failure. These are two prominent motives that direct students' behaviour toward positive and negative results or outcomes. This is relevant for the teacher who is constantly meeting with his students in class. The other approach is the Achievement Goal Approach. This is the approach that points students toward a specific end. There are three types of this goal approach (a) a performance approach goal (b) a performance avoidance goal approach and (c) a mastery goal approach (Elliot & McGregor, 1999).

A performance approach goal is aimed at attaining competence in relation to others. A performance avoidance goal approach is focused on avoiding incompetence in relation to others. A mastery goal is focused on the development of competence. It is said that achievement motives are said to have indirect influence while achievement goal has direct influence on achievement related outcomes (Elliot & McGregor, 1999).

These motives and goals are said to work together to regulate achievement behaviours. Therefore, when students perform below expectation as it often happens in our school, then one will be tempted to ask (a) Does the student do poorly because he is on the negative side of this motive (avoidance approach) Does the teacher not use the achievement motive techniques to improve the performance of his students? Or, is the teacher not aware of these approaches? Any of these could be the students' problem.

This study therefore intends to investigate, if indeed, achievement motivation can affect the academic achievement of the students. In order to guide this study, the following research hypotheses were formulated:

Ho_1: There is no significant relationship between Achievement Motivation and academic achievement of the students in chemistry.

Ho_2: There is no significant relationship between the perceived teaching method of the teacher and the academic achievement of the students in chemistry.

Ho_3: There is no significant relationship between students attitude and academic achievement of the students in Chemistry.

Method

The Research Design was survey research design.

Population for this study was SS II students from selected schools in Lagos metropolis.

Sample
200 SSII students (100 male and 100 female students) were selected by stratified random sampling towards the end of the year. The distribution is as follows:

Schools	**Male**	**Female**
Obanikoro Baptist High School, Obanikoro, Lagos	25	25
Aguda Grammar School, Aguda, Lagos	25	25
Ejigbo High Senior Secondary School	25	25
St. Finbar's College Akoka, Lagos	25	-
Wesley Girls' Senior Secondary School, Yaba		25
Total	**100**	**100**

This distribution were from public secondary schools in Lagos metropolis. Efforts were made to ensure that each of the schools selected, had covered a reasonable ground in the SS II chemistry syllabus.

Instruments
1. A 25-item 5 –point Likert scale type attitude scale questionnaire towards chemistry was developed. The scale had the following subheadings;

a. attitude to teachers personality
b. students' perception to teachers instructional techniques
c. teachers' interpersonal relationships among students in class
d. teachers class/laboratory management ability. Some of the items in the attitude scale are as follows

The test/retest reliability coefficient was 0.75 and Split Half reliability was 0.65 (and therefore internal consistency was 0.79).

2. Another questionnaire, Achievement Motivation Scale was developed, it was 25-item 5-point likert scale type questionnaire. The components of the questionnaire were.

a. Parental Expectation /support
b. Teacher Expectation
c. School Climate /Environment
d. Parental Involvement in the students' work
e. Students expectations

The two instruments, Attitudinal Scale and Achievement-Motivational Scale were further validated by confirmatory factor analysis, using principal component varimax rotation.

3. A 30-item multiple choice test was complied from past Senior Secondary Certificate and General Certificate of Education Examinations. The Split Half reliability coefficient was 0.62. Therefore internal consistency was 0.76. The 30-item multiple choice test contained chemistry items that covered Gas Lans, Mole concepts, Separatory Methods, and Electrolysis. Some of the items are as follows:
   1. The molarity of a solution of tetraoxosulphate (IV) acid which contains 4.9g of the pure acid in 250cm^3 of the solution is (a) 0.50M (b) 0.40 (c) 0.20M (d) 0.1M (e) 0.05M

   2. A hydrogen atom from which an electron has been removed contains.
   (a) one proton only (b) one proton one electron only (c) one proton, one electron and one neutron (d) one proton an one neutron only (e) one neutron only

Both instruments were scored manually. The maximum score for the chemistry test was 30 while the minimum was O. The maximum scores for each questionnaire's subset of 5 items was 25, while the minimum was 5. So, maximum for each questionnaires was 100 and the minimum was 20. Each student had three sets of scores. Each questionnaire score was correlated with academic achievement score in chemistry. Pearson Product Moment Correlation Statistics was used for data analysis. The tables below contain the summaries of the results.

Results

Table 1: Correlation of Achievement Motivation Scores with Chemistry Achievement Scores

	N	**Mean**	**SD**	**rcal**	**DF**
Achievement-Motivation Scores	200	18.1	4.1	0.7600	198
Chemistry Scores	20	14.4	4.7		

Data in Table I are used to test the HO_1, which states that there is no significant relationship between Achievement Motivation Scores of the students and their Chemistry Achievement Scores. The result indicates that the students' Achievement Motivation scores correlated significantly with their Chemistry Achievement Scores. This deduction is based on the fact that $r_{calculated}$ value of 0.7600 is greater than $r_{critical}$ value of 0.1946 at 0.05 level of significance.

Table 2: Correlation of Teachers Teaching Method with Chemistry achievement Scores

	N	Mean	SD	rcal	DF
Teachers Teaching Methods	200	38.16	4.4		
				0.7750	180
Achievement in Chemistry	200	14.4	4.1		

Table 2 is to test Ho_2 which states that there is no significant Correlation between Perceived Teachers' Teaching Method Scores and their Chemistry Achievement Scores. The result in the table indicates that the Teachers Teaching Method Scores Correlated significantly with the students Chemistry Achievement Scores. This is based on the fact that $r_{calculated}$ value of 0.7750 is greater than $r_{critical}$ value of 0.1946 at 0.05 level of significance.

Table 3: Correlation of Student Attitude with their Chemistry test Scores

	N	Mean	SD	rcal	DF
Students Attitudes scale Score	200	38.0	4.5		
				0.3783	180
Achievement in Chemistry	200	14.4	4.7		

Ho_3 which states ht there is no significant relationship between Students' Attitude Scores and their Chemistry Achievement Scores is being tested using the data in Table II above. The results indicates that the students' Attitudes scores correlated significantly with their Chemistry Achievement Scores. This is because the $r_{calculated}$ value of 0.3783 is greater than $r_{critical}$ value of 0.1946 at 0.05 level of significance.

Discussion

Because the evidence from Table I show that $r_{calculated}$ of 0.7600 is greater than r_{table} of 0.1946 at 0.05 level of significance, the relationship between Achievement Motivation scores and Chemistry Achievement Scores is significant. Therefore the relationship between Achievement Motivation Scores and Chemistry achievement scores is significant. Therefore Ho_1 is rejected. This shows that in every learning, there is some element of Achievement Motivation which drives the student to study in order to pass the examination.

For those who may not have done well, maybe they are in the category of Achievement Avoidance group or the ones who may be absent. Such students are afraid of failure and losing their self worth and self concept (Atkinson & Freather, 1966; Ilogu 2000; Elliot & McGregor, 1999). Buttler (1999) pointed out that task involved activities would enable one to grow and develop competence. It is through this opportunity that those variables that

influence learning, discussed earlier, will all come into play. Of particular interest are the variables of meaningfulness, contiguity, reinforcement, motivation and imagery and elaboration which are so much used in skill learning as in Chemistry learning (Noble, 1962).

Achievement Motivation enables a student to achieve his goal because he would be involved in task oriented activities to avoid failure (Thompson Davidson & Barber, 1995). In all these, teachers can be helped to assist the student.

A look at table II, shows that $r_{calculated} = 0.7750$ and r_{table} is 0.1946. therefore $r_{cal} > r_{table}$. So, the correlation is significant. Therefore Ho_2 is rejected. The result shows that there is a significant relationship between teachers' teaching method and achievement score in Chemistry. Indeed, teaching method can be a reinforcing agent and a deterrent towards effective study. In a previous research study, these variables are very much implicated as predictors of success, parent expectation, teachers' expectation, learning environment and the students' achievement motivation (Maya 2000). Teachers are therefore advised to always plan their teaching to enable their students to achieve.

Evidence from table III, shows that $r_{calculated}$ is 0.3783, while r_{table} is 0.1946. Since $r_{cal} > r_{table,}$ the relationship is significant at 0.05 significant level. So Ho_3 is rejected. Therefore there is a significant relationship between attitude and achievement in chemistry. Earlier, Eiss and Harback (1972) has stated that affective skills are important and essential for both cognitive and psychomotor activities to begin. They emphasized that willingness to perform, which is affective, is a key to all other activities because there is interplay between cognitive, affective and psychomotor skills in any learning situations.

Now that the research findings have shown a direct relationship between attitude and performance, school authorities should endeavour to improve their learning environment to make students have positive feeling about the schools. One of the variables of learning discussed earlier is contiguity. It is a variable that is seen working in important areas of learning called classical conditioning. Through classical conditioning, behaviour modification can be effected. Through classical conditioning (contiguity) the child can develop positive or negative attitudes towards schooling. Martin & Pear (2003) suggested the use of rational emotive therapy to change negative perception one must have developed over a thing.

Summary and Conclusion

Variables that influence learning have been discussed. Such variables include motivation, reinforcement, contiguity, meaningfulness and similarity. From the findings of this study, achievement motivation, attitude of students and teacher's teaching method have significant relationships with academic achievement. Teachers should emphasize achievement motivation for students in any learning situation. It may be one way of facilitating learning and improving school performance.

Where a student has gone to a stage of depression, despondency or avoidance approach, techniques, such as rational emotive therapy, extinction, shaping and conditioning can be used to change their negative disposition to positive disposition.

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