THE EFFECTS OF GOAL AND BEHAVOURAL MOTIVATION CHARACTERISTICS PROCESSES ON LEARNING OF CORE SCIENCE SUBJECTS: A CASE OF FOUAD ACADEMY, ABUJA

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ABSTRACT

The study on the effect of motivational process on learning of science subject such as chemistry, physics, mathematics and biology using a case study; were conceptualized on characteristic positive motivation on learning process and asserting possible empirical solution carried out involving three levels of secondary school that is senior secondary one to three respectively. The design structured questionnaire include, behavioural and life goal orientational patterns. It was discovered that life goal and behavioural pattern had a defined orientation against the student motivation at this level. As they advance, phase challenges on class gaining, goal orientation and behavioral patterns begin to have correlation convergence with motivation in learning science subject. Female student deviate or changes behaviour and goal orientation at challenges; it was discovered that female student deviate favorably with challenge as they progress in classing. They do face challenges like the male students, due to science cognitively domain of studies. Approach showed that goal responses, behavioral pattern, societal oriented achievement, as well as parent and gender influences science student performance and reaction to success and failure. Life goal responses, behavioral patterns in reaction to behavioral challenge were defined for success at science subject cognition, transfer, knowledge and skill. From the non inferred analysis of the studied parameters motivation was not influence amongst students in senior one to three for life goal and behavioral patterns characteristics.

Keywords: Life goal, Behavioral characteristics and Challenge, Social characteristic, Reactions, Cognition, Science subject

INTRODUCTION

The effect of motivational process influences a child's acquisition, transfer and use of knowledge and skills for the science subjects at the secondary level. Before now, it has been known that ability is not the only influential factor that makes a child to seek or avoid challenges from science subjects at school whether they seek, continue or withdraw from

face difficulty, and whether they use or develop latent skills. Recent findings indicates that social cognitive approach away from internal contingencies on one hand and global internal state on the other hand – had shifted to an emphasis on cognitive mediation on how children construe the situation and interpret events in the situation and as well process information about situation with less spelt out approach such as life goals and behaviors. Although internal and external contingencies are by no means ignored. They are seen as part of a process, whose working is best penetrated by focusing on ongoing cognitive variables to understanding science subjects Sanfeliz and Slalzar (2003). Motivational processes like life goals ,behavioral characteristic societal variables, historical facts on the child's and using the child's environment to arouse interest or dis-interest at certain parameter composed in the child environment has not been reported to define motivational learning generally as combined forced or singled parametric variable Glynn and Koballa (2006), Sanfelize and Slalzar (2003).

STATEMENT OF PROBLEM
Science subject had been seen difficult by our student at secondary school level because of motivational steps or processes, sometimes, these processes of pressing on our children particular subject may affects learning ability when goals, behaviors characteristics could not be apportioned which are however traceable to lack of cognitive know-how of the child or on the child. Science subject in Nigeria schools have been seen to be difficult and children tend to shift to the social sciences and the art classes. Learning   core science subjects is a sure road to unlock and tap our national potential for all sector growth and development.

OBJECTIVE OF THE STUDY
- To determine goal, behaviors and challenge as tools for motivational learning of core science subject at Fouad Academy Abuja.

RESEARCH QUESTIONS
1. Do life goals motivate learning   of core science subjects?
2. Do behavioral challenges motivate learning of core science subjects?

RESEARCH DESIGN AND METHODOLOGY
The study adopted a descriptive research with emphasis on survey approach .That is, the opinion of student on what tools their motivation on learning of science subject starting from senior secondary one to three (SS1-3)The study population consists of all senior classes taking core sciences subjects like chemistry, physics, biology and mathematics as a subject at Fouad Academy in Federal Capital Territory Abuja .The students on these population were (54) fifty four including both the male and female students which took chemistry, physics, biology and mathematics from each class respectively. Eighteen student (18) between the age (15-19) years from twenty five (25) as the class population were drawn from both the male and female students as the population. Nine (9) male and nine (9) female students at senior secondary one, nine (9) male and nine (9) female students at

senior secondary two and nine (9) male and nine (9) female students at senior secondary three with 50 % of the population respectively.

The researcher visited each of the three classes that is senior secondary one to three personally for on spot assessment through the use of questionnaire. Each questionnaire administered were waited for eight hours and then collected from the students. The questionnaire contains six (6) items such as low, average, high, very low, very high and average characteristics. They were divided into two parts the first part deals with student interest level; the second part dwells on confidence level. Guttmann scale for multidimensional variable measurement was used for the stratified random sampling on parameters based on subject's interest and confidence level

DATA ANALYSIS

Each data collected through the use of stratified random sampling were subjected to frequency rating which have been used in the analyzing the responses of student who respondent to the questionnaire. Thereafter the frequency values from each student score in the categorized classes were subjected to chi-square .Test in other to ascertain sample difference amongst the values. The raw data from the questionnaire were statistically analyzed using chi -square

Chi – square $x^2 = \dfrac{\sum (f_0 - f_e)^2}{f_e} = chi - square\ test$

f_o = observed frequency
f_e = Expected frequency

But,

$$f_e = \frac{Raw\ total\ \times column\ total}{Grand\ total}\quad or\quad \frac{Rt \times Ct}{Gt}$$

RESULTS

T able 1(a): For **Life Goal Achievement Characteristics in SS1**

Male students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2$/f_e
Self	1	1.5	-0.5	0.25	0.16
Pride	1	0.5	0.5	0.25	0.5
Parent	6	3	3	9	3
National Issues	0	0	0	0	0
Peer group	1	4	-3	9	2.25
X^2 calculated					5.91

X^2 critical at df = 4 and 0.05 significant is 9.49 > X^2 Calculated 5.91

T able 1 (ai): For Life Goal Achievement Characteristics in SS1

Female students	f_o	f_e	f_o-f_e	$(f_o-f_e)^2$	$(f_o-f_e)^2/f_e$
Self	2	1	1	1	1
Pride	0	0.5	-0.5	0.25	0.5
Parent	0	3	3	9	3
National Issues	0	0	0	0	0
Peer group	7	4	-3	9	2.25
X^2 calculated					6.75

X^2 critical at df = 4 and 0.05 significant critical9.49>X^2calculated6.75

Table 1(b): Behavioural Characteristics Chi-Square Analysis in SS1

Male students	f_o	f_e	f_o-f_e	$(f_o-f_e)^2$	$(f_o-f_e)^2/f_e$
Challenge	8	6	2	4	0.66
Avoid challenge	0	1	-1	1	1
Persistence	1	2	-1	1	0.5
X^2 calculated					2.75

X^2 Critical   at df = 3 and 0.05 significant level 7.82 >X^2calculated

Table (1bi): **Behavioural Characteristics Chi-Square Analysis in SS1**

Female students	f_o	f_e	f_o-f_e	$(f_o-f_e)^2$	$(f_o-f_e)^2/f_e$
Challenge	4	6	-2	4	0.66
Avoid challenge	2	1	1	1	1
Persistence	3	2	-1	1	0.5
X^2 calculated					2.16

X^2 critical = 7.82 at df = 3 and 0.05 Significant is 7.82 > X^2 Calculated

T able 2(a): Life Goal Achievement Characteristics Analysis in SS2

Male students	f_o	f_e	f_o-f_e	$(f_o-f_e)^2$	$(f_o-f_e)^2/f_e$
Self	8	6.5	-1.5	2.25	0.34
Pride	1	1	0	0	0
Parent	0	1.5	-1.5	2.25	1.5
National Issues	0	0	0	0	0
Peer group	0	0	0	0	0
X^2 calculated					1.84

X^2 Critical at 7.82 df = 4, 0.05 Significant level is > X Calculated

T able 2(ai): Life Goal Achievement Characteristics Analysis in SS2

Female students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Self	5	6.5	-1.5	2.25	0.34
Pride	1	1	0	0	0
Parent	3	1.5	1.5	2.25	1.5
Nat. issues	0	0	0	0	0
Peer group	0	0	0	0	0
X^2 calculated					1.84

X^2 critical 9.49 at df = 4 and 0.05 significant level > X^2 calculated

Table 2(b):   Behavioural Characteristics Chi-Square Analysis Table SS2

Male students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
challenge	8	8	0	0	0
Avoid challenge	0	0	0	0	0
Persistence	1	1	0	0	0
X^2 calculated					0

X^2 Critical = 7 .82 at df = 3 , 0.05 significant level.X^2critical>X^2cal

Table 2(bi): Behavioural Characteristics Chi-Square Analysis Table in Ss 2

Female students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Challenge	8	8	0	0	0
Avoid challenge	0	0	0	0	0
Persistence	1	1	0	0	0
X^2 calculated					0

X^2 critical 7 .82 at df = 3   and 0.05 significant level. X^2critical > X^2cal

T able 3(a): Life Goal Characteristics Achievement Analysis in SS3

Male students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Self	7	6	1	1	0.16
Pride	1	0.5	0.5	0.25	0.5
Parent	1	2.5	-1.5	2.25	0.9
National issues	0	0	0	0	0
Peer group	0	0	0	0	0
X^2 calculated					1.66

X^2 critical 9.49 at df = 4 and 0.05 significant level
X^2 critical 9.49 > X^2calculated

T able 3(ai): Life Goal Characteristics Achievement Analysis in SS3

Female students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Self	5	6.5	-1.5	2.25	0.16
Pride	1	1	-0.6	0.36	0.6
Parent	4	2.5	1.5	2.25	1.5
Nat. issues	0	0	0	0	0
Peer group	0	0	0	0	0
X^2 calculated					1.84

X^2 critical 9.49 at df = 4 and 0.05 significant level
X^2 critical 9.49>X^2calculated

Table 3(b): Behavioural Characteristics Chi-Square Analysis in SS3

Male students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Challenge	7	7.5	-0.5	0.25	0.03
Avoid challenge	0	0	0	0	0
Persistence	2	1	1	1	1
X^2 calculated					1.03

X^2 critical 7 .82 at df = 3 , 0.05 significant level, **X^2cri**tica >X^2cal

Table 3(bi): Behavioural Characteristics Chi-Square Analysis in SS3

Female students	f_o	f_e	f_o-f_e	$(f_o$-$f_e)^2$	$(f_o$-$f_e)^2/f_e$
Challenge	8	7.5	0.5	0.25	0.03
Avoid challenge	0	0	0	0	0
Persistence	1	0.5	0.5	0.25	0.5
X^2 calculated					0.53

X^2 critical 7.82 at df = 3 , 0.05 significant level. X^2critical>X^2calculated

DISCUSSION

Table 1(a-ai) showed chi-square analysis on goal responses for male and female students in senior class one. The null hypothesis is rejected because the X^2 critical calculated is less than X^2 critical tabulated, hence motivation here for learning of science subject is not influenced by life goal orientation. This rejection may be due to different goal and task pursuit. They attribute some of this failure to lack of salient ability, Elliot and Dweck (1985). Boys equal goals in mathematical achievement but girls out ways boys in verbal reasoning. Science subjects are cognitive in nature hence its derivation, Benbow and Stanley (1980), attributed it to genetic make- up of children at this stage. The future task in science subject may have caused reduced motivation in girls than in boys at this class stage, because boys are attracted to task than girls, Licht *et al.,* (1984).

Table 1(b-bi) showed that the null hypothesis does not affect motivation of learning science subjects at this stage. The independent nature in bahaviour exhibited by male and female SS2 students might be because of physiological and genetically make-up, Ben bow and Stanly (1980). This could cause varied orientation toward interest. According to Licht *et al.,* (1980), task preference by girls to boys and the theory of intelligence (entity) had an influence in this in correlation sex behavior amongst the female and male student in this senior secondary level. This variation might be because of challenge, motivational interest and poor influences as well as physiology and genetic composition. Male student life goal differs from the female student life goal Wien *et al.,* (2003), Margolis and Mc Cabe (2006), assert that performance goal is a function of ability and behavior and perception from the environment, according to Dweck (1985), the differences arise from motivational patterns, skills and academic subjects. Future expectancy can also influence this differences, according to Pearson *et al.,* (1982), found in correlational difference in male and female future course expectancies even when the male / female were equivalent in their perception of their present mathematical ability. This implies that as they graduate to newer classes, the differences may diverge the more because of difficulty or task attached to the science subjects.

Table 2(a-ai) showed chi-square analysis on life goal for male and female respondent. The null hypothesis is rejected since X^{2cal} is less than X^2 critical from table, for male and female students. Therefore life goal does not have motivation on students at this level. This reason might be that students at this level thus response to intrinsic and extrinsic variables. This infers that sexes are equal and strives for goal opportunity. This relevancy establish between the male and female might be because future task foreseen by them or the awareness that science subject is cognitively difficult. According to Deweck (1989), instructional alternation, anxiety, low independency had brought about these differences. (Corno and Snow 1986) said that instructional systems like adaptive learning environments, model, individual guided education and program for learning in accordance to needs when individualized and paced were the cause of the same goal pursuit amongst the male and female responded students in senior class two (2).

Table 2(b-bi) showed that the null hypothesis is rejected since X^{2cal} is less than X^2 critical from table, for male and female students. Therefore behavioural characteristics like challenge, avoid challenge and persistence does not have motivation on students at this level of learning of science subjects. This might be that at this level, the students are getting matured and seems to direct their behaviour towards guided and instructed directions. Dweck (1989) said that the following taxonomy structure like personal knowledge, personal experience in education, self image, self efficacy, self regulation cognitive and learning style, social competence perception of instructional environments with self temperament attitude and emotions are all connected to educational behaviour. There exist no relationship between life goal and behaviour which are attributed to maturity attainment on the side of the students for life goal orientation and ability to define the future, perhaps ability to control their environment and follow up on instructional system

Table 3(a-ai) showed that the null hypothesis is rejected since X^2 critical calculated is less than X^2 critical tabulated. This infers that life goals do not motivate learning of science subjects. Since they are faced with same focus it might be the course of this sameness. At this level, both sexes seek favourable judgment and avoid unfavourable judgment in the eyes of the others, hence this increases their competence and seek challenges Elliote & Dweck (1982), Dweck (1989).

Table 3(b-bi), the variable chi-square analysis indicates that life goal and challenges determines student behaviours in any environmental set up. Hence emphasis should be laid on learning goal and performance goal to infer positive attitude on the defined student. At this stage, the student behaviour tends to be flexible only by face challenges; learning push and performance reinforcement could re-navigate their behavioural feelings. Many factors contribute to student goal setting and feelings of helplessness, but research showed that highly competitive grading systems that foster comparison with others and give the impression that only a few students will meet the high standards are likely to promote performance goals and learning and thereby promotes motivation, Cohen (1986), Ames *et al.,* (1972).

CONCLUSION

Process motivation based on goal behavior orientations influences student as they progress in class. The input of intrinsic and extrinsic motivations to a large extent can change the notion that science subjects are hard or difficult to study, especially at senior secondary one class. Getting this through by the class teacher could help a nation like Nigeria harnesses her potentials.

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APPENDIX

**Questionnaire on Motivation Based on Achievement, Behavioural, Subject
Interest and Confidence Level (MABIC)**

Please tick where appropriate, that suits your view and understanding.

1. What sharpened your life goal as you take science subjects?
   (a) Yourself
   (b) Peer group
   (c) Parent
   (d) School environment (i) Just like that
   (e) Your teacher
   (f) National issues
   (g) Pride

2. What sharpens your behavior as a science student?
   (a)   When you seek challenge
   (b)   When you avoid challenge
   (c)   When you are persistent