



## **Correlating University Students' Academic Attainment and Sense of Hope in Science Education: A survey from a Nigerian University**

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### **Abstract**

Existing contexts within the Nigerian higher education system have taken a toll on the extrinsic motivation of students. In view of the effect of these dynamics on the overall objective of science education, students' sense of hope holds a unique significance for academic wholeness. This study employs an ex post facto research design to examine the relationship between science education students' sense of hope and their academic achievement. The sample comprises 69 second-year students drawn from the science education programmes of a federal university in North Central Nigeria. The Trait Hope Scale and student written responses on personal motivation for science education provided data that were analyzed using mean, standard deviation, t-test, correlation, and thematic analysis. The findings reveal overall high mean scores for sense of hope ( $\bar{x} = 51.812$ ,  $SD = 6.687$ ), a weak positive correlation between hope and students' CGPA that was not statistically significant, and broad desire for acquiring knowledge for society building. The implications of these outcomes for resilience in university education and human capacity development were discussed.

**Keywords:** Hope; Hope Theory, Academic Tenacity, Science Education, Nigeria Higher Education

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### **Introduction**

Every society engages the services of educational institutions to consciously inculcate her existing body of knowledge, values, norms, science and technology into the young generation for the purpose of active participation in the society. Schools exist to equip students who will ultimately spend their adult life in multitasking, multifaceted, technology-driven, culturally diverse, and vibrant world (Iji, Abah & Anyor, 2017). Presently, Nigeria practices the 9-3-4 system of education. This implies that there is a continuous Nine (9) years of Basic Education, three (3) years of Senior Secondary

Education and four years of Higher Education. The first Nine years of formal education comprises three years of Lower Basic Education (Primary 1- Primary 3), three years of Middle Basic Education (Primary 4 – Primary 6), and three years of Upper Basic Education (Junior Secondary 1 - Junior Secondary 3). The completion of Basic Education should aid an individual to effectively communicate in English Language (Nigeria's *lingua franca*) and appropriately deploy numeracy, creative thinking and problem solving skills. The Basic Education Certificate Examination (BECE) taken at the end of JSS 3 is the lowest requirement for jobs in the informal sector while the Senior Secondary Certificate Examination (SSCE) is a standard requirement for holding any political office within the country. The two officially recognized bodies for assessment and certification at the end of three years of Senior Secondary Education are the National Examination Council (NECO) and the West African Examination Council (WAEC). Certificates from any of both bodies are pre-requisite to obtaining admission into any programme of study at the higher educational level.

Students who successfully complete their secondary education has the option of progressing to higher educational institutions for National Diploma, National Certificate of Education, Higher National Diploma or Bachelor degree in any preferred field of study. Earning a university degree has become more gratifying among Nigerians in recent years with the Joint Admissions and Matriculation Board (JAMB) processing millions of admission placements every year. Like in every other country, a degree in hand makes one more desirable to potential employers, particularly in a difficult economy (Sorrentino, 2012). Other popular reasons for enrolling in a degree programme are pay increase (for those already working), promotion, networking opportunities and development of critical thinking and communication skills. According to Sorrentino (2012), a sound degree programme aids young adults to choose a desirable field or career.

Within the Nigerian social climate, however, schooling may be attributed to reasons outside the commonly cited ones. For many homes, getting into the university is a normal progression of life, as very few Nigerians actually began to earn their livelihoods before getting on campus. Families that are adequately enlightened desire highly respected social status, and having graduates within the family is rapidly becoming an egocentric race. Still, other Nigerians see university education as the only path to economic emancipation. For such families, all available resources must be pushed into the education of deserving members to secure the future of the younger ones. To this category of Nigerians, education is not a luxury but a foundation for life (Abah, 2017).

The varying perspectives of university education among Nigerians have put unnecessary pressure on the entire university system (Modebelu & Agommuoh, 2014; Arowolo & Alade, 2014; Peretomode & Ugbomeh, 2013). The most obvious outcome of this institutional pressure is the mishandling of students' career choices by degree awarding institutions. The nationwide notion is the quest for any degree that can lead to a gainful employment irrespective of the area of study. This has gradually shifted attention away from the pursuit of cherished professions to the grab for paper qualifications into scarcely available positions in government ministries, agencies and departments. This wanton orientation among the generality of admission seekers and their families implies the attitudes and lifestyles when eventually offered a place in our noble ivory towers may fall short of the expected intensity. The less than adequate self-confidence, lack-luster affective engagement, waning psychological investment seen among university students, particularly those in science education programmes, have featured prominently in recent studies (Iji, Abah & Anyor, 2017; Abah, 2017).

Basically, the objectives of science education set out in the Benchmark Minimum Academic Standard (BMAS) of the National Universities Commission (NUC) are far-reaching and well intended. According to NUC (2007), science education programmes must seek:

- i. The acquisition, development and inculcation of the proper value-orientation for the survival of the individual and the society
- ii. The development of the intellectual capacities of individuals to understand and appreciate their environments
- iii. The acquisition of both physical and intellectual skills which will enable individuals to develop into useful members of the community;
- iv. The acquisition of an objective view of local and external environment.

The departments of science education across Nigerian universities are expected to produce teachers in Science, Technology, Engineering and Mathematics (STEM) fields with the knowledge, skills and attitudes which will enable them to contribute to the growth and development of their communities in particular and the nation in general. Science education professionals are to encourage the spirit of enquiry, creativity and entrepreneurship in science teachers, and to enhance the skills of teachers in the use of new technologies (NUC 2007). As such, graduates of science education are required to contribute significantly to the growth of the Nigerian economy.

Conversely, existing realities in the Nigerian economy has driven up employment anxieties among undergraduates of science education (Ayeni, 2005; Joshua, Azuh & Olanrewaju, 2015). Undergraduates are seeing sharp drop of extrinsic motivation considering the pathetic joblessness of those who have gone ahead of them. Coupled with other systemic issues affecting the Nigerian education system, academic outcomes are staggering in the wrong direction, giving weight to questions of the employability of graduates of Nigerian universities (Anho, 2011; Aluko, 2014). The juxtaposition of students' admissions outside their preferences and academic ability is increasingly leading to cases of skills mismatch among university graduates in the Nigerian labour market (Pitan & Adedeji, 2012; Shadare & Tunde, 2012).

Against the backdrop of the interplay of forces on the overall objective of a typical science education student in Nigeria, the place of hope holds unique significance for academic wholeness. Given the peculiarity of the challenges of the Nigerian university system, academic success for the science education undergraduate requires more than ability. It requires the application of ability and the growth of ability through sustained hardwork, mindsets, goals and self-regulatory skills (Dweck Walton & Cohen, 2014). Science education students who have a growth mindset about intelligence, learning goals, higher-order purpose, and a sense of hope are expected to show more grit in their academic work. In view of this supposition, this study seeks to investigate the driving force behind students display and lack of tenacity. Specifically, the research work intends to examine the relationship, if it exists, between science education students' sense of hope and their academic achievement. If this relationship exists then how strong is it? Does it differ according to gender? These and other pertinent concerns form the basis for this study.

## **Literature Review**

A few years ago, an Africa-wide report commissioned by the British Council was triggered by the state of higher education across the continent. The study observed that educational systems have been allowed to expand without corresponding resources, leading to a catastrophic drop in quality and the churning out of increasing numbers of poorly equipped

graduates into an already congested job market (McCowan, 2015). The key findings of this study noted that university students no longer see their future in conventional salaried employment and are mostly unwilling to speak out about the problems their universities faced. For the students, giving back to their communities is an important goal while developing employability skills and securing employment is particularly difficult for certain groups from disadvantaged backgrounds (McCowan, 2017). The implication of these existential realities of African higher education is the translation of heavy burdens and demands on students who are regularly confronted with the uphill task of becoming dependable members of the society. Students, as a result of the numerous challenges, are susceptible to dropping out due to not being prepared for the rigors of academic work; inability to cope with the competing demands of study, family and jobs; and the rising cost of university education globally (Carlozo, 2012; Okoli, 2015). In the presence of these contending issues, success in science education must first begin intrinsically in the self-esteem and mindset of the students.

Self-esteem is a feeling of being happy with one's own character and abilities. It is a set of attitudes and beliefs that a person brings with him or her when facing the world (Harris, 2009). It includes beliefs as to whether he or she can expect success or failure, how much effort should be put forth, reactions to instances of failure and the likelihood of building success from seemingly difficult situations or experiences. Self-esteem is generally considered the evaluative component of self-concept, a broader representation of the self that includes cognitive and behavioural aspects as well as evaluative or affective ones (Blascovich & Tomaka, 1991 in Harris 2009). The literature on self-esteem often reveals that the inner balance and stability which each person achieves is directly related to their emotions, social relationships and behaviors (Harris, 2009). Goal orientation, perceived competence and other facets of achievement belief are all components of self-esteem that impact-students' achievement behaviour (Leondari & Gialamas, 2002).

A major theoretical foundation for hope research is Snyder's Theory of Hope. Hope Theory, a strength-based construct that is part of the emerging positive psychology field, was developed and re-conceptualized by C. R. Snyder and colleagues since 1991. According to hope theory, hope reflects individuals' perceptions regarding their capacities to clearly conceptualize goals, develop the specific strategies to reach those goals (pathway thinking), and initiate and sustain the motivation for using those strategies (agency thinking) (Snyder, Lopez, Shorey, Rand & Feldman, 2003). In this line of reasoning, hope is not an emotion but rather a dynamic cognitive motivational system which can be measured as a cross-situational construct that correlates positively with self-esteem, perceived problem-solving capabilities, perceptions of control, optimism, positive affectivity and positive outcome expectancies (Snyder, Shorey, Cheavens, Pulvers, Adams III & Wikland, 2002). Hope enables students to approach problems with a focus on success, thereby increasing the probability that they will attain their goals (Conti, 2000 in Snyder *et al.*, 2002).

According to Snyder *et al.* (2003), the pathways and agency component are both necessary, but neither by itself is sufficient to sustain successful goal pursuit. As such, pathways and agency thoughts are additive, reciprocal and positively related but they are not synonymous. Within the framework of the hope theory, a goal can be anything that an individual desires to experience, create, get, do or become. A goal may be significant, life-long pursuit or it may be mundane and brief. Leondari and Gialamas (2002) identify two key arrays of goals required by students, namely task goal orientation and performance-approach goal orientation. The former seek to develop and improve ability while the latter

is the goal to demonstrate and prove ability. In terms of perceived probabilities of attainment, Snyder *et al.* (2003) note that high-hope individuals prefer “stretch goals” that are slightly more difficult than previously attained goals. Such individuals are more likely to develop alternative pathways, especially when the goals are important and when obstacles appear.

The proponents of hope theory maintained that no matter how good the cognitive routing, however, the pathways thoughts are useless without the associated agency-inducing cognitions (Snyder, Cheavens & Michael, 1999 in Snyder *et al.*, 2003). These agency thoughts reflected in the positive self-talk that is exhibited by high hope individuals who continually declare statements like “I can do this”, “I will not give up” and “when the going gets tough the tough gets going”. Based on this orientation, Snyder and colleagues developed the Trait Hope Scale to measure hope as a relatively stable personality disposition.

Another theoretical dimension to students’ sense of hope is the composite existence of some non-cognitive factors that promote long-term learning and achievement, brought together under the label *Academic Tenacity*. Dweck, Walton and Cohen (2014) maintain that at its most basic level, academic tenacity is about working hard and working smart, for a long time. More specifically, academic tenacity is about the mindsets and skills that allow students to look beyond short-term concerns to longer-term or higher-order goals and withstand challenges and setbacks to persevere toward these goals (Dweck, Walton & Cohen, 2014). Dweck and colleagues assert that students’ beliefs about their academic ability influence their academic tenacity. This implies that students may not enthusiastically seek to learn or grow their intelligence if they do not see learning as serving a purpose that has meaning to them. In other words, students’ higher-order or long-term goals, collectively known as purposes, contribute to their engagement and tenacity (Dweck, Walton & Cohen, 2014). Longer-term purposes, even when they are still developing, can provide a reason for students to adopt and commit to learning goals in school. This according to Dweck, Walton and Cohen (2014), is because students who are working with purpose feel that they are learning so that they can become the kind of person they would like to be and contribute something of value to the world; not simply memorizing material and content to pass a test. In this sense, a purpose can also encompass a commitment that goes beyond the individual.

Relatedly, Dweck, Walton and Cohen (2014) point out that even if students have mindsets and goals that encourage tenacity, they may still perform below their potential. But self-regulatory skills - those that allow students to rise above the distractions and temptations of the moment stay on track and navigate obstacles to long-term achievement - also contribute to academic tenacity and school achievement (Dweck, Walton & Cohen, 2014). Particularly for science education as a broad discipline, the fundamental underpinning of scientific resilience - failing repeatedly and picking oneself up to try again - cannot be neglected (Whitlock, 2017). Such perseverance in the pursuit of long-term goals has come to be known as *grit* (Dweck, Walton & Cohen, 2014).

Several empirical works have identified the connection between students’ beliefs about themselves and their academic competence in the classroom. Cybinski and Forster (2009) examine the impact of students’ personal inputs such as effort, ability and personal training on performance in an introductory statistics course. Ability and prior training were jointly measured as a single score from a simple numeracy test administered at the start of the course, while effort was measured by voluntary attendance. The study found that individual students’ scores on the test, as well as their levels of attendance, were strongly

related to academic success in the course. The results of the study emphasized the fact that student engagement is closely related to effort and specifically to attendance.

Similarly, Ugwu, Onyishi and Tyoyima (2013) explore the relationship between academic burnout, self-efficacy and academic engagement among Nigeria university undergraduates. The sample for the study comprises 200 respondents drawn from the Faculty of social sciences in a state-owned university in North Central Nigeria. The results of the regression analyses revealed that academic burnout was negatively related to academic engagement. Self-efficacy was found to be positively related to academic engagement.

In the same vein, Harris (2009) carried out a study to determine if a relationship exists between the self-esteem and academic success of African American students in the Minority Engineering Program at a research-extensive University in Southern United States. The Coppersmith Self-Esteem Inventory Adult Form was used to measure the level of self-esteem of all respondents. An analysis of 121 completed online survey indicated high levels of self-esteem and a positive relationship between self-esteem and academic performance. Relatedly, another study by Leondari and Gialamas (2002) considered the perceived competence of 451 elementary and junior high schools students to moderate the relationship between implied theories, goal orientations and actual achievement. The results of Pearson Product Moment Correlations and Path analysis show theoretically important inter-correlation that replicated previous research. Goal orientation was observed to have an indirect effect on achievement, which was mediated through perceived confidence.

This present study builds on the foundation of previous research into the significance of self-moderated constructs in the academic growth of students. The study is unique in its consideration of hope as a more encompassing measure of self-concept, effort and goal orientation. Like other empirical works mentioned in this work, the approach to analysis is descriptive and correlational. The consideration of the broad discipline of science education gives credence to the extended reach of the outcome of this study, particularly in Nigeria.

### **Research Questions**

The following questions guided this study:

- i. What are science education students' descriptions of their motivations for studying science education courses?
- ii. What is the mean difference between the sense of hope scores of male and female science education students?
- iii. What is the relationship between the sense of hope scores and academic achievement of science education students?

### **Hypotheses**

The following hypotheses were tested at 0.05 level of significance.

- i. There is no significant difference between the sense of hope scores of male and female science education students.
- ii. There is no significant relationship between the sense of hope scores and academic achievement of science education students.

### **Methodology**

Based on the nature of this study, ex-post facto research design requiring descriptive, comparative and correlational methods was adopted. The ex-post facto design was

considered appropriate for the study due to its scope of coverage in explaining existing relationships and developing trends.

The target population of the study comprises the 384 students enrolled in the science education programmes of a federal university in North Central Nigeria. The sample consists of 69 second-year (200 Level) students of science education in the 2016/2017 academic sessions. The programme options in science education are B.Sc.Ed. Biology, B.Sc.Ed. Chemistry, B.Sc.Ed. Integrated Science, B.Sc.Ed. Physics, B.Sc.Ed. Mathematics and Computer Science, B.Sc.Ed. Mathematics and Statistics, and B.Sc.Ed. Statistics and Computer Science.

The main instrument of this study is the Trait Hope Scale developed by Snyder *et al.* (1991). Required to be deployed as “The Future Scale”, the instrument is a 12-item measure of a respondent’s level of hope. In particular, the scale is divided into two subscales that comprise Snyder’s cognitive model of hope: Agency (goal-directed energy) and Pathways (planning to accomplish goals). Of the 12 items, 4 make up the Agency subscale (items 2, 9, 10 and 12) and 4 make up the Pathways subscale (items 1,4, 6 and 8) The remaining four items are fillers. Each item is answered using an 8-point Likert-type scale ranging from Definitely False to Definitely True. The total Hope Scale score is derived by summing the four Agency and pathway items, with total scores ranging from 8 to 64, higher score representing higher hope levels (or sense of hope). For this study, the Cronbach alpha co-efficient of the Future Scale is 0.79

The total hope score for each student was matched with the students’ academic attainment taken as the Cumulative Grade Point Average (CGPA) at the end of the previous academic session. Mean, standard deviation and the Spearman Correlation co-efficient were used to answer research questions two and three while a random replication of the respondents one-sentence personal descriptions of motivation for study were used to answer research question one. The first hypothesis was tested at 0.05 level of significance using t-test. The second hypothesis was tested using t-test of correlation co-efficient.

The respondents of this study voluntarily participated in filling out the questionnaire given to them directly by the team of researchers. Adequate permissions were also sought from the Departmental Examinations Office of the Science Education Department of the university to allow the use of students’ results for the study. To protect the privacy of the respondents, all students’ names in the study were coded.

## Results

The results of this study are presented according to the research questions and hypotheses.

### Research Question One

What are science education students’ descriptions of their motivations for studying science education courses?

When prompted to state the main reason they came to the university to study science education courses, the participants of this study gave a wide range of answers. A large proportion of these responses are presented in Table 1 along with the students’ hope scores. The expanse of coverage is purposive in order to expose dominant student views about science education while giving even the most unlikely perspective a chance to be aired.

**Table 1: Students’ Motivation for University Education in Science Education**

S/No.	Motivation for studying Science Education	Hope Score
Student 1	To become a successful professor in education.	50

Student 2	To be a qualified teacher and a maker of future leaders.	55
Student 3	Given to a scarcity of jobs in other sector of the economy in Nigeria, I believe studying science education course would earn me a living.	42
Student 4	It is because I want to be a professional teacher.	50
Student 5	The main reason is that I want to be a professional teacher.	41
Student 6	To upgrade my skills and knowledge in order to be an effective teacher.	56
Student 7	To be a professional teacher (human engineer).	53
Student 8	To add positive value to myself, society and country.	55
Student 9	To become an educator to curb the menace in the world, setting moral excellence through teaching and educational management,	62
Student 10	I have that passion in me to teach or lecture, i.e. being a teacher or a lecturer.	54
Student 11	I came to the university to study science in order to impact positively the knowledge of science to my students-to-be as a good or trained teacher in the field of science education.	51
Student 12	I dream of becoming a lecturer someday, giving me the opportunity to stand before hundreds of students and pass across the Gospel to them.	50
Student 13	To be complete future ideal teacher.	56
Student 14	I came to the university to study science education course in order to be educated and creative to the society.	52
Student 15	I came to the university to study Civil Engineering but destiny changed me to study science education. I am delighted to study it, I feel so appreciated to study it.	56
Student 16	I came to the university to study a science education course because I want to use my experience to build a better future in the educational sector of this great nation.	62
Student 17	I came to the university to study a science education course because I want to work everywhere in the world.	60
Student 18	To be able to teach any science-related course given to me at any given time efficiently.	43
Student 19	I love education and teaching.	47
Student 20	To become a successful lecturer.	41
Student 21	I believe something good can come out of me.	49
Student 22	Because an educational course offers a vast opportunity now in the labour market.	51
Student 23	To outright grab a good job after school as education is vastly needed in the labour market.	55
Student 24	To come and acquire knowledge in order to impart the knowledge to the society and the generations to come.	47
Student 25	It was because I was given the course and it is difficult to get admission.	29
Student 26	I came to study a science education course so that I will be a professionally trained teacher.	45
Student 27	I came to study science education in the university so as to become a professional teacher.	42

Student 28	To become an educator to younger generation.	54
Student 29	I wish to become a good teacher	51
Student 30	Though it is not my intention to study science education course, I can still come up with an aim/focus. The reason I came to study a science education course is to be best I can be as a professional tutor.	56
Student 31	I applied for Electrical Electronics Engineering but unfortunately I was given a course “Chemistry Education”. But I thank God for all.	56
Student 32	Although it wasn’t my preferred course, I came here to study and become a lecturer.	59
Student 33	To develop the ability or skills of teaching in order to be able to teach others tomorrow.	58
Student 34	To attain my goals to be a professional teacher in sciences.	56
Student 35	I have a passion for teaching.	51
Student 36	I came here to study education because I have a passion for teaching.	42
Student 37	Because I love teaching and was given a science education course by the school.	50
Student 38	I want to influence my society through teaching.	51
Student 39	To achieve my goals as someone who can transfer knowledge to someone and to be independent.	55
Student 40	In order to make effective decisions in personal, civic and national affairs.	43
Student 41	It has been my desire to positively impart knowledge and this is a good avenue, I believe, to be fully equipped.	45
Student 42	I came to the university to study a science education course because I love imparting knowledge and would wish to know more about science.	42
Student 43	To achieve my goal in life and to be a knowledge transmitter.	55
Student 44	Because I love teaching as a profession.	54
Student 45	To become an educationist.	61
Student 46	I came to study a science education course because I discover that is a self-developing course.	55
Student 47	To acquire knowledge about sciences so as to modify my behaviours and transfer to the younger ones.	58
Student 48	I study science education because I want to be educated to educate.	47
Student 49	I have passion for teaching, and by the grace of God I want to be a great teacher.	38
Student 50	I came to the university to study a science education course because of the passion I have for the education sector.	58
Student 51	Personally, I did not apply for science education but as they gave me, I have no choice but to do it.	57
Student 52	To help change the illiteracy rate in my community.	61
Student 53	Although I had no choice when my course was changed to science education, I have come to love and like the course which makes me a positive catalyst in the education sector.	53
Student 54	Because I want to work under the Federal Ministry of Education in	45

future.	
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The qualitative replications of students' personal responses on their motivation for studying science education are necessary as Table 1 has shown a wide variation in the students' perception of the purpose of university education.

### Research Question Two

What is the mean difference between the sense of hope scores of male and female science education?

**Table 2: Mean Difference in Sense of Hope Scores between Male and Female Science Education Students**

Gender	N	Mean Sense of Hope Score	Std. Dev.	Skewness	Kurtosis
Male	58	52.293	6.510	-1.002	1.407
Female	11	49.273	7.350	-0.080	-1.209
<b>Mean Difference</b>		<b>3.020</b>			

The results in Table 2 indicate that male science education students scored higher in the sense of hope measure than their female counterparts. This translates to a mean difference of 3.020 in favour of male science education students.

### Research Question Three

What is the relationship between the sense of hope scores and academic achievement of science education students?

**Table 3: Spearman Correlation between Sense of Hope Scores and CGPA of Science Education Students**

Variable	N	r	Remark
Sense of Hope	69		
		0.052	Weak positive relationship
CGPA	69		

The result in Table 3 shows that there is weak positive relationship between sense of hope scores and academic achievement (CGPA) of science education students.

### Hypothesis One

There is no significant difference between the sense of hope scores of male and female science education students.

**Table 4: t-test Analysis of the Difference between the Sense of Hope Score of Male and Female Science Education Students**

Gender	N	$\bar{x}$	Std. Dev.	t	t-Critical	p-Value
Male	58	52.293	6.510			
				1.383	1.996	0.1714*
Female	11	49.273	7.350			

\*Not significant at  $\alpha = 0.05$

The results in Table 4 indicate that there is no significant difference between the sense of hope scores of male and female science education students, since t-calculated = 1.383 is less than t-critical = 1.996. Evidently, the p-value of 0.1714 is not significant at 0.05 level of significance.

### Hypothesis Two

There is no significant relationship between the sense of hope scores and academic achievement of science education students.

**Table 5: Test of Correlation Analysis between Sense of Hope Scores and CGPA of Science Education Students**

Variable	N	r	p-Value
Sense of Hope	69	0.052	0.6687*
CGPA	69		

\*Not significant at  $\alpha = 0.05$

The data in Table 5 shows that there is no significant relationship between the sense of hope scores and academic attainment of science education students, since the p-value of 0.6687 is not significant at 0.05 level of significance.

## Discussion

### *Rationale for University Education among Science Education Students*

The qualitative explication of students response on their motivation for studying science education courses in the university was comprehensively carried out in this study to present the essence as seen from the perspectives of the people involved (Abakpa, Agbo-Egwu & Abah, 2017). The presentation in Table 1 reveals a high level of open-mindedness and exposes some existential issues in Nigerian higher education. Four key issues can be deduced via thematic analysis of the responses in Table 1.

The first dominant theme explicable from the students' written responses is professionalism in teaching. Many science education students considered their choice of course of study to be predicated on the desire to train as professional teachers of science. Students 10, 11, 26, 27 and 34 all expressed their passion for teaching, the quest for improved professionalism in the education sector, and the need to acquire the relevant skills for sustainable science education. This category of students truly falls in line with the broad objectives of the science education programme at the university level (NUC, 2007).

A second theme observed in Table 1 is the issue of wrong placement in the admission process by Nigerian universities. Some of the students did not intend to offer science education programmes in the first place. Students 15 and 31, for instance, applied to study Engineering but ended up in science education. Student 25 attributes this misplacement to difficulty in securing admission into desired programmes in Nigerian universities. Some students in this category have accepted their fate within science education, and like Student 30, 51 and 53, have strategized to re-focus within their given course of study for optimal academic performance. This outcome is in line with the autoethnographic coverage of same issue by Abah (2017) who reports that cultural disregard for education-based disciplines runs up high and is eating deep into the fabric of the higher education community. Unlike Students 35, 36, 37 and 41 who have the right interpretation of the wide reach of education in the society, some science education students considered their degree option pitiable.

Thirdly, a key rationale among science education students for studying up to the university level is the need to fare better in Nigeria's tight labour market. Student 22 is into a science education programme "because an education course offers a vast opportunity now in the labour market." Relatedly, Student 23 observes that a higher education degree in science education is required "to outright grab a good job after school, as education is vastly needed in the labour market." This category of students affirms Abah (2017) assertion of the marketability of science education programmes in present-day Nigeria. These programmes prepare students in developing attributes that are well sought after in government departments, private companies and firms, and international agencies (Iji &

Abah, 2017). Formal and informal learning, through raising awareness and influencing behavior, as obtainable in science education, plays a pivotal function in achieving sustainable development for the country. This role is especially pronounced as students are being prepared to enter the labour market and emerge with skills to support green economies and as messengers of ideas (OECD, 2007).

The fourth rationale for university education put forward by some students in Table 1 is that of broadly acquiring knowledge to contribute to society building. For instance, Student 8 wishes to add value to self, society and country, while Student 9 desires to become an educator to curb the menace in the world, setting moral excellence through teaching and educational management. Similar thoughts were conveyed by Students 24 and 39. Student 40 wrote “in order to make effective decisions in personal, civic and national affairs” as his rationale for university education. Such fruits of higher education are increasingly manifesting across the soci-political landscape in Nigeria (Kundiri & Usman, 2017; Edinyang, Odey & Gimba, 2015; Uzochuckwu & Ekwugha, 2014; Odeyemi & Mosunmola, 2015). A unique response by Student 52 indicates she wishes to help change the illiteracy rate in her local community. Others, like Students 41, 42, 46 and 47, see their involvement in science education programmes as a means of self-development.

The findings of this study in respect to students’ rationale for higher education hold some pertinent implications for the Nigerian higher education system. It is true that some students attend university because a university degree and the practical skills they can acquire will bring them better employment opportunities in the future. However, the debate on the fit between higher education and work normally revolves around relationships of dependency and autonomy relative to the university’s functions and the requirements of the economy and the production sector (Enric, Carme & Esparanca, 2010). In this regard, the dependency model assumes correspondence between the educational profiles of graduates and the jobs they fill – with provision matching and responding to the demands of the workplace, whereas the relative autonomy model questions the existence of a presupposed correspondence and proposes a dynamic regulation through successive and flexible adjustments between the labour supply and a production sector that adapts to the labour force that is available at a given time and in a given context (Enric, Carme & Esparanca, 2010). Obviously, qualification and skill cannot be assimilated just from formal undergraduate studies, and hence other ways of learning such as through work experience and teaching practice exercise are required (Abah, 2016).

In light of the findings of this study, science education programmes must have graduate outcome statements that include graduate profiles, education pathways and employment pathways. In this regard, Spronken-Smith *et al.* (2013) observe that graduate profiles identify the expected learning outcomes of a qualification, say B.Sc.Ed., which is captured in notions of what a learner will know, understand and be able to do when they achieve the qualification. Education pathways identify other qualifications that a graduate could enroll in after completing this qualification. Where qualification are standalone, and do not prepare graduates for further study, the outcome statement should make this clear (Spronken-Smith *et al.*, 2013). Employment pathways or contributions to the community identify the areas in which a graduate may be qualified to work, or the contribution they may make to their community. Consequently, higher educational institutions need to offer more course-level information and better organization of their offering of internships, placements, work experience and skills support, all tailored to specific subjects, with support available from those with experience in those industries and fields (Kandiko &

Mawer, 2013). There is need for more information on employability with focus on process and development opportunities within the field of science education.

In the same vein, institutions of higher learning must champion the course of social transformation. This implies at very least some fundamental changes in society's core institutions, the polity and the economy, with major implications for relationships between social groups or classes, and for the means of the creation and distribution of wealth, power and status (Brennan, King & Lebeau, 2004). Universities in Nigeria must take up their roles in the building of new institutions of civil society, in encouraging and facilitating new cultural values such as those displayed by Student 52 in this study, and in training and socializing members as a repository for national sentiments that could come out of storage when time and circumstance permit. An educated populace is thus vital considering the convergent impacts of globalization, the increasing importance of knowledge as a main driver of growth, and the information technology revolution (Otonko, 2012).

### ***Hope and Resilience among Science Education Students***

Hope is thought of as a state of mind; when understood as closely related to optimism it is thought of as a personality, a matter of temperament; when times are desperate, it is spoken of as a coping mechanism most clearly recognized when lost or missing; and its deepest grounding is as a virtue to be cultivated and cherished (Bullough, 2011). The outcomes of this study have indicated high sense of hope for both male (Mean Hope Score = 52.298; SD = 6.510) and female (Mean Hope Score = 49.273; SD = 7.350) science education students. Overall, the undergraduates used in this study scored 51.812 (SD = 6.687) on the Future Scale, an indication of a high sense of hope in science education. This implies a good degree of acceptability of university education as a channel for progress and a tendency to show more grit in the course of their study. The study failed to establish a significant difference between the sense of hope scores of male and female science education students, although there is a mean difference of 3.020 in favour of male students. As shown in Table 5, this study did not establish a significant relationship between hope and academic attainment of science education students. This outcome agrees with the findings of Seirup and Rose (2011) who report that students with higher levels of hope appeared to have slightly higher beginning semester GPAs which were however not statistically significant. The finding of a weak positive correlation between sense of hope and CGPA observed in this study (Table 3) is not surprising when considered in line with Herrero (2014) who obtain similar level of relationship between and among achievement motivation, hope, and resilience and CGPA. The non-significant gender difference in hope scores established in this study is in tandem with Rehman, Rehman, Razzaq and Wali (2014) who report t-test that demonstrated non-significant gender differences in Trait Hope Score among university students.

In view of these high hope outcomes observed in this study, science education programmes in Nigeria can nurture resilience throughout the student experience. This can be done through the way in which teaching, learning and assessment are approached, through the design of social spaces and services both on and off campus, particularly student accommodation; to the way in which broader skills are developed (McIntosh & Shaw, 2017). Such efforts should be targeted at the accumulation of human capital as well as the accumulation and application of knowledge to production (Farrell, Harmon, Laffan & O'Carroll, 2006).

A resilient science education programme should promote income growth; contribute to labour productivity, entrepreneurial energy, and quality of life; enhance social mobility; encourage political participation; strengthen civil society; and promote democratic

governance (Task Force on Higher Education and Society, 2000). Herein lies the hope expressed by the students in Table 1 of this study. Their university education should create public goods such as new knowledge – a catalyst for rapid development – and should provide a safe space for the free and open discussion of the values that must define character of Nigeria’s development. Resilience on the part of the students in attaining a successful higher education will transform them to enlightened leaders, offer social liberty and help the talented to fulfill their potential. Hope, as expressed by the students of this study, irrespective of the unfavourable context within the country, will lead to the acquisition of increasingly relevant skills that will contribute to appropriate solutions in such vital areas as environmental protection, the prevention and treatment of illness, industrial expansion, and infrastructure provision (Task Force on Higher Education and Society, 2000). High level of hope implies improved levels of time invested in education and personal development (as related by Students 41, 42, 46 and 47 in Table 1), culminating in sustainable human capital development (Shuaibu & Oladayo, 2016).

### **Conclusion**

This study has examined science education students’ sense of hope as a correlate of academic attainment in a Nigerian university. Building on the theoretical foundations provided by the Hope Theory and the Academic Tenacity Paradigm, the work considered students’ sense of hope in science education as a more encompassing measure of self-concept, effort and goal orientation. The qualitative data explication and thematic analysis of students’ responses on personal motivation for university education reveal the desire to become professional teachers, positioning for favourable career pathways, and broadly acquiring knowledge to contribute to society building.

Although the study failed to establish a statistically significant relationship between sense of hope scores and academic attainment of science education students, high hope figures were recorded and correlated to students’ CGPA. These outcomes were discussed in line with the general rationale for university education among science education students and the place of resilience in Nigeria’s higher education system.

Despite the robustness of this study, it is limited in its consideration of hope without specific treatment of agency and pathway items of the Trait Hope Scale. Future studies may seek to refine the approaches of this study to harness even the minutest detail an in-depth coverage of hope entails.

### **References**

- Abah, J. A. (2016). Repositioning the pedagogy of the teaching practice course in mathematics education: Implications for stakeholders in a globally depressed economy. A paper presented at the 4<sup>th</sup> National Conference of the Faculty of Education, Benue State University, Makurdi, Nigeria, pp 1-11.
- Abah, J. A. (2017). Original higher education experience of graduating students of mathematics education in Nigeria: An autoethnographic approach. *Education Journal*, 6(6), 177-187. doi: 10.11648/j.edu.20170606.13
- Abakpa, B. O., Agbo-Egwu, A. O. & Abah, J. A. (2017). Emphasizing phenomenology as a research paradigm for interpreting growth and development in mathematics education. *ABACUS: The Journal of the Mathematical Association of Nigeria*, 42(1), 391-405. DOI 10.17605/OSF.IO/SGBZT.
- Aluko, Y. A. (2014). Employers’ perceptions of the employability skills of new graduates in Nigeria. *Journal of Educational Review*, 7(4), 547-556.

- Anho, J. E. (2011). An evaluation of the quality and employability of graduates of Nigeria universities. *African Journal of Social Sciences*, 1(1), 179-185.
- Ayeni, E. A. (2005). Epidemiological study of depression among students in a tertiary institution: A case study of Obafemi Awolowo University, Ile-Ife. *Nigerian Journal of Health and Biomedical Sciences*, 4(1), 82-87. DOI: 10.4314/njhbs.v4i1.11544
- Brennan, J., King, R/ & Lebeau, Y. (2004). *The role of universities in the transformation of societies: An international research project synthesis report*. London: Association of Commonwealth Universities.
- Bullough, R. V. (2011). Hope, happiness, teaching and learning. In C. Day & J. C.-K. Lee (Eds.), *New Understandings of Teacher's Work*. Professional Learning and Development in Schools and Higher Education 6. pp 15-30. DOI: 10.1007/978-94-007-0545-6\_2
- Carlozo, L. (2012). *Why college students stop short of a degree*. Retrieved on 27<sup>th</sup> April, 2017 from <http://www.reuters.com/article/us-attn-andrea-education-dropouts-idUSBRE82Q0Y120120327>
- Cybinski, P. J. & Forster, J. (2009). Student preparedness, effort and academic performance in quantitative business course. In D. T. Nguyen (Ed.), *Discussion, Papers and Economics*. Brisbane: Griffith Business School. Pp 1-35.
- Dweck, C. S., Walton, G. M. & Cohen, G. L. (2014). *Academic tenacity: Mindsets and skills that promote long-term learning*. Seattle, Washington, DC: Bill & Mellinda Gates Foundation. pp 1-40.
- Edinyang, S. D., Odey, C. O. & Gimba, J. (2015). ICT and knowledge integration for social development in Nigeria. *British Journal of Education*, 3(10), 13-21.
- Enric, C. R., Carme, S. C. & Esperanca, V. H. (2010). *The match between university education and graduate labour market outcomes (Education-job match): An analysis of three graduate cohorts in Catalonia*. Barcelona: AQU Catalunya. Pp 1-101.
- Farrell, L., Harmon, C., Laffan, C. & O'Carroll, C. (2006). *Economic and social impact of higher education*. Dublin: Irish Universities Association.
- Harris, S. L. (2009). *The relationship between self-esteem and academic success among African American students in the minority engineering program at a research extensive university in the southern part of the United States*. A Dissertation submitted to Louisiana State University in partial fulfilment of the requirements for the degree of Doctor of Philosophy. pp 1-99.
- Herrero, D. M. (2014). *The relationship among achievement motivation, hope, and resilience and their effects academic achievement among first-year college students enrolled in a Hispanic-serving institution*. A Dissertation submitted in partial fulfilment of the requirement for the Degree of Doctor of Philosophy in Counsellor Education, Texas A&M University, Corpus Christi. pp 1-47.
- Iji, C.O., Abah, J.A. & Anyor, J.W. (2017). Impact of cloud services on students' attitude towards mathematics education in public universities in Benue State, Nigeria. *International Journal of Research in Education and Science (IJRES)*, 3(1), 228-244. Retrieved on 3<sup>rd</sup>
- Joshua, S., Azuh, D. & Olanrewaju, F. (2015). University-industry collaboration: A panacea to graduate unemployment in Nigeria. *BVI MSR's Journal of Management Research*, 7(1), 17-25.
- Kandiko, C. B. & Mawer, M. (2013). *Student expectations and perceptions of higher education*. London: King's Learning Institute. Pp 1-79.

- Kundiri, A. M. & Umar, M. B. (2017). Rethinking youth economic empowerment in Nigeria: Deepened democratization, entrepreneurship and ICT as tactical options. *Journal of Research in Humanities and Social Science*, 5(3), 51-58.
- Leondari, A. & Gialamas, V. (2002). Implicit theories, goal orientations, and perceived competence: Impact on students' achievement behaviours. *Psychology in the Schools*, 39(3), 279-291.
- McCowan, T. (2015). *Students in the driving seat: Young people's voices on higher education in Africa*. A report commissioned by the British Council as part of the Universities, Employability and Inclusive Development project. Pp 1-27. Retrieved on 12th February, 2017 from <http://www.britishcouncil.org/education/ihe>.
- McIntosh, E. & Shaw, J. (2017). *Student resilience: Exploring the positive case for resilience*. Bristol: United students.
- Modebelu, M. N. & Agommuoh, P. C. (2014). Environmental hazards and hostel accommodation problems: Challenges for university education in Nigeria. *US-China Education Review B*, 4(6), 407-413.
- National Universities Commission – NUC (2007). *Benchmark minimum academic standards for undergraduate programmes: Education*. Abuja: National Universities Commission. pp 1-353.
- Odeyemi, T. I. & Mosunmola, O. O. (2015). Stakeholders, ICTs platforms and the 2015 general elections in Nigeria. National Conference on “The 2015 General Elections in Nigeria: The Real Issues” held July 27-28, 2015 at the Electoral Institute, Independent National Electoral Commission, Abuja, Nigeria.
- OECD (2007). *Higher education for sustainable development: Final report of international action research project*. Paris: OECD
- Okoli, N. J. (2015). Impact of fees increase on university students' education in Nigeria. *Merit Research Journal of Education and Review*, 3(2), 115-118.
- Otonko, J. (2012). University education in Nigeria: History, successes, failures and the way forward. *International Journal of Technology and Inclusive Education*, 1(2), 44-48.
- Perotomode, V. F. & Ugbomeh, A. N. (2013). Problems faced by undergraduate and diploma students and their survival strategies in Nigeria: An institutional analysis. *International Journal of Educational Planning & Administration*, 3(1), 25- 33.
- Pitan, O. S. & Adedeji, S. O. (2012). Skills mismatch among university graduates in the Nigeria labour market. *US-China Education Review A*, 1, 90-98.
- Rehman, A., Rehman, S., Razzaq, S. & Wali, A. S. (2014). Relationship between hope and anxiety among university students. *European Journal of Psychological Research*, 1(2), 21-25.
- Seirup, H. & Rose, S. (2011). Exploring the effects of hope on GPA and retention among undergraduate students on academic probation. *Education Research International*, Volume 2016, Article ID 381429, 1-7, DOI: 10.1155/2011/381429
- Shadare, O. A. & Tunde, E. S. (2012). Graduate unemployment in Nigeria: Causes, effects and remedies. *British Journal of Arts and Social Sciences*, 5(2), 142-154.
- Shuaibu, M. & Oladayo, P. T. (2016). Determinants of human capital development in Africa: A panel data analysis. *Oeconomia Copernicana*, 7(4), 523-549. DOI: <http://dx.doi.org/10.12775/OeC.2016.030>.
- Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T. et al. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60, 570-585.

- Snyder, C. R., Lopez, S. J., Shorey, H. S., Rand, K. L. & Feldman, D. B. (2003). Hope theory, measurements, and applications to school psychology. *School Psychology Quarterly*, 18(2), 122-139.
- Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams III, V. H. & Wiklund, C. (2002). Hope and academic success in college. *Journal of Educational Psychology*, 94(4), 820-826.
- Sorrentino, E. (2012). *Top 10 reasons earning a college degree is an awesome idea*. Retrieved on 27th April, 2017 from <http://blog.grantham.edu/blog/bid/131896/Top-10-Reasons-Earning-a-College-Degree-Is-an-Awesome-Idea>
- Spronken-Smith, R., Bond, C., McLean, A., Frielick, S., Smith, N., Jenkins, M. & Marshall, S. (2013). *How to engage with a graduate outcomes' agenda: a guide for tertiary education institutions*. NZ: Ako Aotearoa – The National Centre for Tertiary Teaching Excellence. Pp 1-27. Retrieved on 18<sup>th</sup> may, 2018 from <http://www.akoaotearoa.ac.nz/graduate-outcomes>.
- Task Force on Higher Education and Society (2000). *Higher education in developing countries: Peril and promises*. Washington, DC: World Bank.
- Ugwu, F. O., Onyishi, I. F. & Tyoyima, W. A. (2013). Exploring the relationships between academic burnout, selfefficiency and academic engagement among Nigerian college students. *The African Symposium*, 13(2), 37-45.
- Uzochukwu, C. E. & Ekwughu, U. P. (2014). New media and youth's online civic engagement in Nigerian politics: Potentials and challenges. *European Scientific Journal*, 10(19), 203-221.
- Whitlock, S. (2017). *One reason young people don't go into science?: We don't fail well*. Retrieved on 27<sup>th</sup> April, 2017 from <https://www.statnews.com/2017/03/21/science-research-fail>.