

Achievement Motivation And Locus Of Control As Predictors Of Secondary School Students' Academic Achievement In Chemistry In Enugu State, Nigeria

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Abstract

Academic achievement is usually used to describe an individual's performance in subjects taught and tested in school. The poor performance of science students in WASSCE, in particular chemistry continued. This has always been attributed to teaching method of chemistry teachers, the students' lack of interest and many others. But there are some psychological constructs that forms the basic make up of every individual (student), example achievement motivation and locus of control which also can contribute to the performance of these students. Achievement motivation is a person's desire to succeed or complete a task successfully while Locus of control refers to an individual's perception about the cause of the various events (good/bad; success/failure) that happens in his/her life. The study was undertaken to investigate secondary school students' achievement motivation and locus of control as predictors of their academic achievement in chemistry in Enugu State, Nigeria. The study is a correlational survey research. The population of the study consist of the entire senior secondary two (SS2) students totalling 17045 students from government owned schools. The sample size for the study was derived to be 231 SS2 Chemistry students drawn from 12 out of 293 government owned schools in Enugu State using the multistage sampling technique. The data collected were analysed statistically using hierarchical regression analysis, while the ANOVA table was used to test the null hypothesis at 0.05 alpha level. The findings revealed that Achievement motivations and Locus of control have a significant joint prediction power on their academic achievement in chemistry. The researchers therefore recommend that students should be exposed to occasional training that will help them improve their achievement motivation and locus of control.

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I. Introduction

In this present age, education has some mutual role to play in the development of any nation. It occupies a pivotal position in the natural economic build-up of man. Education can be referred to as all the activities, which go on in the schools, colleges or universities with the aim of imparting desirable knowledge, ideas, concepts or skills to learners so that they might become useful to themselves and the society. In every society, individuals and governments take education seriously because of its great influence on the lives of the individuals and the nation. Education is seen as a tool for the individual's social mobility and the transformation or changing of the society. In the light of this, a well-educated person is an asset not only to himself but also to his country. That is the reason large sum of money is budgeted for education at all levels because government is also aware that education has the capacity to transform a society economically and politically. Education therefore, is the process of transmitting or transferring values, skills, knowledge and attitude to a learner which will be useful to the society and the learner. Despite the huge investments in education by both parents and government, the performance of science students in senior school certificate examinations (SSCE) has long been a matter of concern to many well-meaning individuals, institutions and organizations as well as to various levels of government (Kpolovie, Ololube & Ekwebelem, 2011). This is because academic achievement and performance of students in the sciences has implications for the nation's technological development.

Academic achievement is a very important factor in education. It is the extent to which a student, teacher or institution has achieved their educational goals (Sepehrian, 2013). Chowdhury and Pati as cited in Awan, Noureen and Naz (2011), commented that academic achievement refers to particular learning in a particular setting which is defined by examination marks, teachers' given grades and percentiles in academic subjects. Academic achievement maybe defined as a measure of knowledge, understanding or skills in a specific subject or a group of subjects (Lent et al. in Chetri, 2014; Steinmayr, Mibner, Weidinger & Wirthwein, 2015;

Tamannaifar&Gandomi, 2011). Academic achievement is one of the most important indicators of learning and understanding in all educational systems. It is undoubtedly a research after the heart of many educational psychologists, who make an attempt to investigate what determines academic outcomes of learners (Rahmani, 2011). According to Adeyinka, Adedeji and Olufemi (2011), the attainment of success by a student in his school work among his classmates is termed academic achievement. Kpolovie, Joe and Okoto (2014), defined academic achievement as the ability of a student to study and remember facts and being able to communicate his knowledge orally or in written form even in an examination condition. The authors also opined that academic achievement is a measurable index that depicts a student's cognitive, affective and psychomotor domains in educational setting.

Avoseh as cited in Okafor, Obi and Oguzie (2018), simply defined academic achievement as how well an individual has done in his cognitive tasks. He further explained that it is the general ability of students regarding their performance in school subjects compared to a specified standard called 'pass mark'. Thereafter, academic achievement refers to the observed and measured aspects of a student's mastery of skills and subject contents as measured with valid and reliable tests (Joe, Kpolovie, Osonwa&Iderima, 2014). Academic achievement is usually employed to describe an individual's performance in subjects taught and tested in schools. It also refers to the level of education ultimately attained by an individual (Gbonee, 2014). Aryana (2010) observed that students with high academic achievement are predisposed to feel more convinced and satisfied than those with poor academic achievement. Also students who obtain higher academic achievement tend to feel more confident, whereas those who lack confidence in themselves record low academic achievement. According to Squier (2016), academic achievement is sometimes viewed as the amount of content learned by students. It is measured by intelligence (example Intelligence quotient) and standardized tests in core subject areas (example mathematics, chemistry, physics). Academic achievement is mostly measured using examinations or continuous assessment but there is no conclusive agreement on how best it is tested or which aspect are most necessary. The differences in academic achievements can be attributed to various factors like intelligence, creativity, self-esteem, cognitive style, achievement motivation, instructional strategy, self-efficacy, personality and many others (Sharma & Pooja, 2018). Since there are many factors that play an important role to promote or decline academic achievement, some of these factors which include achievement motivation, locus of control and many others are very essential to be recognized and used to improve the academic achievements of students.

Achievement motivation is an individual's ability to desire strongly success in general or in a specified discipline. Achievement motivation as posited by Chetri (2014) is the attitude to achieve rather than the achievements themselves. It can be considered as an extended person-intrinsic motivation because its reinforcement is delayed. It arises from an interaction within the person. It is also a pattern of planning of actions and of feeling connected with striving to achieve some internalized standard of excellence (Chetri, 2014). Murray as cited in Chetri described achievement motivation as a desire to accomplish something difficult, to overcome obstacles and attain a high standard, to excel oneself. He indicated that high achievement motivated students are moderate risk takers and have an energetic approach to work. In other words, it is a motivation to achieve, a person's desire to succeed or complete a task successfully. Achievement motivation can be linked to Locus of control as it relates to people's attitudes, emotions and motivation, as well as behaviour in organizations and educational institutions (Spector & Fox, 2005).

Locus of control refers to an individual's generalized expectations concerning where control over subsequent events resides. In other words, it refers to whom or what is responsible for what happens. According to Turker and Inel (2012), locus of control forms during childhood and stabilizes during adolescence, and it depends on various experiences the individual goes through like culture, religion, societal influence, sex, age and training. It is an individual's belief system regarding the causes of his or her experiences and the factors to which that person attributes success or failure (Majzub, Bataineh, Ishak & Rahman, 2009). According to Rotter (1992), Locus of control refers to the site of a cause, meaning whether or not the outcome of an event is attributed to something inside (internal to) or outside (external to) the person involved. Locus of control can either be internal or external. Students with internal locus of control attribute the cause of their success or failure in academic achievements to their own abilities and skills. They consider themselves to be responsible for their own destiny; this motivates the student to work hard in order to perform well in tests. On the other hand, a student with an external locus of control believed that external factors or situations are responsible in determining their success or failure. Such students have high chances to perform very poorly in tests because they believe that their success is as a result of luck, fate or chance.

Chemistry as a science subject taught in school to students, deals with matter and the changes matter undergoes. It is a subject that is more interested with composition, structure, properties, behaviour of matter and also the chemical changes this matter undergoes during chemical reaction. Ugwoke (2017), while stressing the importance of chemistry opined that chemistry do not just start and end in the classroom or school as often perceived. Some phenomenon in chemistry is practiced in our everyday activities outside the four walls of the

school. Example of such activities which involves chemistry practices are cooking of food, washing of clothes with detergent or soap, the process of boiling grinded fresh tomatoes to allow the liquid to get dried, addition of salt to perishable food stuffs in order to preserve them, the act of melting ice block into liquid water for the purpose of drinking to mention but few. These principles, concepts and facts of chemistry are also practiced in some industries such as food industry, petroleum industry, building industries, road construction industries and many others. States in Nigeria can boost their industrial capacity and efficiency through the application of chemistry education. This is because the knowledge of chemistry can help in development of appropriate technologies in some industries like, drug production industry, cement production industry, the plastic industry and so many others. The nature of chemistry as a core science subject gives the reason for occupying a central position amongst the pure science subjects which are Physics, Biology and Chemistry. Despite the central position of chemistry as a core science subject there is evident poor enrolment of students in chemistry. A number of factors have been identified as contributing to this ugly trend which is lack of qualified chemistry teachers, poor method of teaching chemistry, peer group influence, lack of motivation in students to study chemistry, lack of students' interest in chemistry, inadequate chemistry laboratory and inadequate supply of laboratory equipment (Kola & Akanbi, 2013; Kola, 2013).

Aside the poor enrolment in chemistry, the poor performance of students in chemistry in West African Secondary School Certificate Examination (WASSCE) and National Examination Council (NECO) in recent years is an issue of concern as regards their academic achievement. According to the chief examiners report (2013-2019), from analysis a standard deviation of 16.94, 15.62, 15.36, 16.00, 13.78, and 14.46 was obtained for 2013, 2014, 2015, 2016, 2017, 2018 and 2019 respectively. This fluctuating decline in the performance of chemistry students in WASSCE is also obtainable in Enugu state as can be deduced from WAEC chief examiner's report (2013-2019). Also, NECO Annual Report (2017) analysis shows that only 4.41% of chemistry candidates that sat for the examination passed with distinction. This indicates a very poor performance and chemistry students in Enugu state are not an exception. Moreover for a student to be admitted into any of the tertiary institutions in Nigeria, for any of the science based discipline such as Pharmacy, Physical sciences, Nursing, Biological sciences, Medical sciences, Engineering to mention but few, the student must have a credit pass in Chemistry in WASSCE or NECO. Many students seem to find Chemistry a difficult and abstract subject and this perception seems to affect their academic achievement in Chemistry.

Could this perception about chemistry and poor performance of Nigerian chemistry students in WASSCE and their Chemistry class exam be traceable to their psychological constructs like achievement motivation and locus of control? This makes it imperative to study the achievement motivation and locus of control as predictors of academic achievement among Chemistry students in secondary schools in Enugu

Purpose of the Study/objectives

In general, the study tends to investigate secondary school students' achievement motivation and locus of control as predictors of their academic achievement in chemistry. Specifically, the study sought to determine:

1. The predictive value of achievement motivation on secondary school students' academic achievement in chemistry in Enugu State.
2. The predictive value of locus of control on secondary school students' academic achievement in chemistry in Enugu State.
3. The joint predictive value of achievement motivation and locus of control on secondary school students' academic achievement in Chemistry in Enugu State

Research Questions

The following research questions guided the study;

1. What is the predictive value of achievement motivation on secondary school students' academic achievement in Chemistry in Enugu State?
2. What is the predictive value of locus of control on secondary school students' academic achievement in Chemistry in Enugu State?
3. What is the joint predictive value of achievement motivation and locus of control on secondary school students' academic achievement in Chemistry in Enugu State?

Hypothesis

The null hypothesis was tested at 0.05 alpha level of significance.

- The achievement motivation and locus of control of secondary school students will not have a joint significant prediction power on their academic achievement in Chemistry in Enugu State.

II. Literature Review

Relationship between Achievement motivation and academic achievement

Achievement motivation is considered as a key criterion to judge student's total potentialities and capabilities. Achievement motivation according to McClelland as cited in Awan, Noureen and Naz (2011), is defined as the extent to which individuals differ in their need to strive to attain rewards such as physical satisfaction, praise from others and feelings of personal mastery. Students are influenced by the need to achieve to a certain degree. Those students who have a high desire for success will work hard to achieve unlike their counterparts with low desire for success. Students with high achievement motivation will act in ways that will help them to outperform others, meet or surpass some standard of excellence, or do something unique. Achievement motivation can also be seen as the attitudes towards school and learning enthusiasm for academic achievement. It involves measuring items such as work habits and scholastic expectations. It also plays an important role to achieve educational goals of the students (Kumar & Yadav, 2015). Achievement motivation is a striving to overcome challenges, improve oneself, attain excellence and accomplish more than others according to Smith, cited in Sontakke (2016).

Singh (2011), asserted that achievement motivation is a subjective and internal psychological drive, enabling individuals to pursue work they perceive to be valuable and prompting them to reach their goals. He is of the view that achievement motivation is also a mentality to compete and compare with others. It is the tendency to endeavour for success and to choose goal-oriented success or failure activities. Singh maintained that achievement motivation refers to the need to perform well or the striving for success and evidenced by persistence and effort in the face of difficulties. He posited that achievement motivation is a stable learned characteristic in which satisfaction comes from striving for and achieving a level of excellence. Achievement motivation forms the basis for a good life, this is because people who are motivated to achieve in general, enjoy life and feel in control. Individuals who are achievement motivated set up extremely difficult or extremely easy targets and ensure that they undertake tasks that they can achieve themselves.

A research work was conducted by Ojewola and Faremi (2018), on achievement motivation and parenting styles in promoting effective learning among secondary school students in Ondo state. Descriptive survey design was adopted for this study. The sample was made up of 245 secondary school students randomly selected from five local government areas in Ondo State. A questionnaire titled assessment of secondary school students' academic achievement motivation for promoting learning was used to collect data. Data collected were analysed using analysis of variance and t-test. Three null hypotheses formulated was tested at 0.05 alpha level. The results revealed that there was no significant difference between academic achievement motivation and parenting styles of secondary school students. It was concluded that achievement motivation and the styles adopted by parents in raising their children may not have any impact on the secondary school students' effective learning outcome (academic achievement). It was also recommended among others that teachers and parents should help students to develop achievement motivation. The previous study is related to the present study as achievement motivation, which is one of the variables in both research works is studied among secondary school students. However, the previous study was interested in the relationship between achievement motivation and parenting style with the students learning outcome while the present study tried to verify whether there is a relevant relationship of achievement motivation and locus of control with the learning outcome (academic achievement) of the students in Chemistry in Enugu State.

A study carried out by Kumari and Qasim (2015) of achievement motivation in relation to academic achievement of higher secondary students in Allahabad city, India. The purpose of the study was to find out the level of secondary school students' achievement motivation and the profile of the students' academic achievement. The sample size was 100 students (50 boys and 50 girls) in government and private schools which was taken by quota sampling. The data was collected using achievement motivation test. Mean, standard deviation and ANOVA were used for data analysis. From the study it was discovered that government school students are low level academic achievement motivated in comparison to private school students. They recommended that stakeholders in education should help students to enhance their motivation to achieve so as to improve academic achievement. The previous study is similar to the present study owing to the fact that achievement motivation in relation to the academic achievement of secondary school students is studied in both research work, but this present study went further to study the locus of control together with achievement motivation of the students in relation to their academic achievements.

Sharma and Pooja (2018), in their experimental study on effect of cognitive styles and achievement motivation on academic achievement of 9th grade student through multimedia and traditional instructional strategies used multi-stage sampling. The study was carried out on 64 students (32 in the experimental group, 32 in the control group) of 9th grade of OM public school, Gohana, District (Sonapat) in India. 6 hypotheses were tested at 0.05 alpha level. The researchers collected the data using group embedded figure test for identifying cognitive styles, achievement motivation scale to test achievement motivation and also multimedia instructional package and English achievement test. The data were analysed using Levene's test for homogeneity of variance

and ANOVA with 2×2 factorial design. The findings of the study revealed that there is a significant effect of achievement motivation, cognitive styles on academic achievement of students. The previous study is similar to the present study as achievement motivation on academic achievement of students was studied. However, the previous study was limited only to cognitive style and achievement motivation on academic achievement, but in the present study the researcher tried to ascertain whether achievement motivation and locus of control will predict academic achievement in students.

Relationship between Locus of control and academic achievement

Locus of control is defined as a person's belief that his/her actions affect the special upcoming outcome. Students with internal locus of control believe that their success or failure is a result of the effort and hard work they invest in their education. While students with external locus of control believe that their success or failure is a result of external factors beyond their control, such as luck, fate bias, injustice, circumstances or teachers who are unfair, prejudiced or unskilled (Mohamed, Mohammed & Ahmed, 2018). People who have internal locus of control feel they can exert control over their lives. They take appropriate responsibility for their life experiences and for their responses to them. This enables them to interpret unexpected adverse events in a more positive light. While those with external locus of control attribute control of their situation to external factors, including other people, institutions and even God. As posited by Treas and Wilkinson, as cited in Mohamed, Mohammed and Ahmed (2018), people who have external locus of control feel that they lack the ability to change what happens to them.

The locus of control of students (chemistry students in particular) has been linked to their academic achievement in various subjects. Grantz (2015), in his study discovered that locus of control of students refers to the types of attributions students make for their successes and/or failures in school tasks. The belief system of a student determines to a large extent what the student attributes his/her success or failure to, which gives a picture of the student's locus of control. Locus of control can either be internal or external. Students with internal locus of control attribute or locate the cause of their success or failure to their own abilities. They believe that they are the ones responsible for their own success or failure. A student who has an external locus of control believes that rewards or outcomes in life are determined by fate, luck or probably chance. Such students believe that they do not have control over their success or failure as well as their destiny. If they do not succeed at anything their academics inclusive they will now attribute their failure to supernatural powers or forces beyond their control

Abid, Kanwal, Nasir, Iqbal and Huda (2016) carried out a research on the effect of locus of control on academic performance of students at tertiary level in University of Faisalabad, Pakistan. Two research questions and one hypothesis guided the study. The purpose of the study was to discover the influences that locus of control has on the learning performance of students. In the research quantitative research method was used. The sample size comprised of 100 students who were selected and issued questionnaire to collect data. Multiple regression analysis was employed to analyse the data collected using SPSS. The findings of the study showed that the academic achievement of students with internal locus of control is high and they are more proactive and effective during the learning process. On the other hand, the ones with external locus of control are more passive and reactive during this period. This implies that locus of control have a positive relationship on academic achievement of the students. The previous study is quite related to the present study in that locus of control on academic achievement studied in the previous study is also studied in the present study. But the previous research was conducted in a university setting, but the researcher in the present study focused on secondary school students.

Deora (2015) did a research on impact of academic self-efficacy and locus of control on academic achievement of high school students. The study was carried out in Mumbai. The purpose of his study was to examine whether there is an impact of gender, academic self-efficacy and locus of control on academic achievement. Self report survey data were collected from 175 students in 11th standard between ages 15-18 in sub-urban Mumbai. The result of the three ways ANOVA showed that there was no significant relationship between locus of control and academic achievement and gender with academic achievement. Also the interaction effect of academic self-efficacy, locus of control and gender on academic achievement was not significant. There was a negative correlation between locus of control and academic achievement, as well as academic self-efficacy and academic achievement. It was suggested that future research in the area should examine broader factors related to parental support, societal expectations, socio-economic status, parents' education level as well as other individual factors like meta-cognition, self-concept, academic procrastination and many others. . The previous study reviewed is similar to the present study because the two variables which are self-efficacy and locus of control are studied in both research works. But, in the previous study only academic self-efficacy and locus of control was studied in relation to the academic achievement of the students, but in the present study the researcher went further to study the students' achievement motivation and locus of control to prove the findings of the previous study.

III. Method

The study is a research conducted via correlational survey design. According to Nworgu (2015), correlational survey research design measures the relationship between two or more variables without the researcher controlling either of them. The study is carried out in Enugu State. Enugu state is located in south-eastern Nigeria. The population of the study consist of the entire senior secondary two (SS2) students totalling 17045 students in the 293 Government owned secondary schools in Enugu State for 2019/2020 academic session. [Source: Planning, Research & Statistics unit, Post Primary schools Management Board, (PPSMB) Enugu. (2019/2020)].

The sample size for the study was derived using Solvin’s formula to be 391 SS2 Chemistry students who were drawn from 12 out of 293 Government owned schools in Enugu State using the multistage sampling technique.

Three instruments were used for data collection. They include Achievement Motivation Scale, Rotter’s Locus of Control Scale and the Students’ Cumulative Result in Chemistry. The Achievement Motivation Scale (AMS) developed by Portia (2016), was adopted to determine the achievement motivation of the students. The scale consists of 43 items in which the students’ responses were measured using 5 point Likert scale ranging from “strongly agree” to “strongly disagree”. Rotter’s Locus of Control scale (RLCS) developed by Rotter (1966), was also adopted to measure the students’ locus of control. The scale is dichotomous ranging between true and false. The scale consists of 20 items. The SS2 students’ cumulative annual Chemistry result for 2019/2020 was obtained from the schools which showed the academic achievement of the students.

The instruments (scales) were revalidated by experts to determine the appropriateness of the instruments in terms of relevance to the purpose of the study, content and clarity of language, suitability to the age of students. On the basis of the suggestions provided by the experts, modifications were affected and the final modified copy was used for reliability test. The reliability of the instruments was established by administering the instruments (AMS & RLCS) to 20 SS2 Chemistry students who were not part of the study. Cronbach’s alpha method was used to determine the reliability of Achievement Motivation Scale because it is a polytomous questionnaire while Kuder-Richardson Formula 20 method was used to determine the reliability of Rotter’s Locus of Control Scale since it is a dichotomous questionnaire (Nworgu, 2015). The reliability index of Achievement motivation scale (AMS) is .84 and that of Rotter’s locus of control scale (RLCS), .73. The reliability indices obtained from the various instruments shows that the instruments are reliable for the study.

Copies of the questionnaire were directly administered to the students in each of the schools and retrieved same day the school was visited. Also, the SS2 students’ cumulative annual result for 2019/2020 was collected from the school’s record system with the aid of the subject teacher at the permission/consent of the school authority. The contributions of the predictor variables on the dependent variables and the incremental validity were analysed using hierarchical regression analysis.

IV. Result and Discussion

Table 1. Descriptive Statistics

	Mean	Std. Deviation	N
Academic Achievement	55.21	14.518	231
Achievement Motivation	175.26	25.255	231
Locus of Control	32.00	3.886	231

Table 1 shows mean and standard deviation (SD), of the students’ scores in academic achievement, achievement motivation and locus of control. The variance in achievement was much with SD of 14.518. Also, achievement motivation has high spread from the mean but locus of control of the students has a close cluster round the mean. Its therefore necessary that other statistical measures apply to ascertain the relationship between metacognition, locus of control and academic achievement of the students.

Table 2. Correlation of Academic motivation, locus of control and academic achievement

	1	2	3
1. Academic Achievement	1		
2. Achievement Motivation	.345*	1	
3. Locus of Control	.326*	.601*	1

*. Correlation is significant at the 0.05 level (2-tailed).

From Table 2, there is a relationship between academic achievement and achievement motivation. It also showed there is a relationship between academic achievement and locus of control as well as between achievement motivation and locus of control. The relationship of the two variables to academic achievement and to one another calls for further analysis to ascertain each variable predict academic achievement single. There is need to also determine if achievement motivation and locus of control jointly predict academic achievement and the percentage of prediction. This can be done using a hierarchal multiple regression.

Table 3: Hierarchical Multiple linear regression table, showing the independent and joint prediction of Achievement motivation and Locus of control on Academic achievement.

variables	B	SE B	t	β
Step 1				
Constant	20.475	6.313	3.243	
Achievement Motivation	.198	.036	5.558	.345**
R	.345 ^a			
R ² Adjusted	.115			
ΔR^2	.119			
F	30.891**			
Df	1, (229)			
Step 2				
Constant	9.523	7.717	1.234	
Achievement Motivation	.134	.044	3.033	.233**
Locus of Control	.694	.287	2.418	.186*
R	.375 ^b			
R ² Adjusted	.133			
ΔR^2	.022			
F	18.697**			
Df	1, (228)			
Durbin Watson	1.606			

Note: ** = $P < .01$; * = $P < .05$.

Based on research findings, Achievement motivation independently predicted Academic achievement among the students, $F = 30.891^{**}$, $R = .345$; R^2 Adjusted = .115; $\beta = .345^{**}$; $t = 5.558$. In Step 1, based on research findings, achievement motivation significantly predicts academic achievement as it can account for 11.5% of the variance observed in academic achievement of the students.

In the second block (Step 2) when locus of control (with independent predicting influence of, $\beta = .186^*$; $t = 2.418^{**}$) was added to the regression, achievement motivation ($\beta = .233^{**}$; $t = 3.033^{**}$), showed a slight significant decrease in its independent prediction of academic achievement among secondary school students. This showed that locus of control also influences academic achievement. Achievement motivation (in step 1) accounted for 11.5% of the variations on academic achievement among secondary school students. However, there was a significant joint prediction of achievement motivation and locus of control on academic achievement, $R = .375^b$; R^2 Adjusted = .133; $\Delta R^2 = .022$; $F = 18.697^{**}$. This result showed that the joint prediction of achievement motivation and locus of control accounted for 13.3% of the variation on academic achievement of the students. The change in the variation as a result of the addition of locus of control was 2.2%.

V. Conclusion and Recommendation

It is concluded that achievement motivation and locus of control independently does predict academic achievement of Chemistry students. It is also concluded that achievement motivation and locus of control jointly predict Chemistry student's academic achievement. The findings reported in this study justify the importance of achievement motivation and locus of control on academic achievement.

It is therefore recommended that trainings should be organized occasionally for Chemistry students to enhance their' achievement motivation and also their internal locus of control. This will change the students' perception about themselves and also their perception towards Chemistry, leading to an improvement in learning outcome. Parents and teachers also should be exposed to programmes that will aid them to understand and boost the students' achievement motivation and locus of control to improve their academic achievement.

References

- [1]. Abid, A.M., Kanwal, S., Nasir, M.A., Iqbal, S., & Huda, N. (2016). The Effect of Locus of Control on Academic Performance of the Students at Tertiary Level. *International Review of Management and Business Research*, 5(3), 860-869.
- [2]. Adeyinka, T., Adedeji, T., & Olufemi (2011). Locus of Control, Interest in School and Self-efficacy as Predictors of Academic Achievement among Junior Secondary School Students in Osun state, Nigeria. *New Horizons in Education*, 59(1), 25-35.
- [3]. Aryana, M. (2010). Relationship Between Self-esteem and Academic Achievement Amongst Pre-University Students. *Journal of Applied Sciences*, 10(20), 2474-2477.
- [4]. Awan, R., Noureen, G., & Naz, A. (2011). A Study of Relationship between Achievement Motivation, Self-concept and Achievement in English and Mathematics at Secondary level. *International Educational studies*, 4(3), 72-79.

- [5]. Chetri, S. (2014). Self-concept and Achievement Motivation of Adolescents and Their Relationship with Academic Achievement. *International Journal of Advancements in Research & Technology*, 3(5), 236-253.
- [6]. Deora, N. (2015). Impact of Academic Self-efficacy and Locus of Control on Academic Achievement of High School Students. *Indian Journal of Mental Health*, 2(2), 197-202.
- [7]. Gbonee, S. (2014). The Effects of Locus of Control on Academic Achievement among Students in secondary Schools in Rivers state: The Case Study of Schools in Ogoni, Rivers state. *African Journal of Education*, 4(1), 20-30.
- [8]. Grantz, M. (2015). Locus of Control and Its Impact on Education. Retrieved From <http://www.units.miamioh.edu/psybersite/control/education.shtml>
- [9]. Joe, A.I., Kpolovie, P.J., Osonwa, K.E., & Iderima, C.E. (2014). Modes of Admission and Academic Achievement in Nigerian Universities. Retrieved From <http://meritresearcherjournals.or/er/content/2014/kpolovie%20et%20al.pdf>
- [10]. Kola, J.A., & Akanbi, A.G., (2013). Perceived causes of students' enrolment in science in secondary Schools, Nigeria. *International Journal of secondary education*, 1(5), 18-22.
- [11]. Kola, J.A., (2013). Importance of Science Education to national development and problems militating against its development. *American journal of educational research*, 1(7), 225-229. doi: 10.12691/ education-1-7-2
- [12]. Kpolovie, P.J., Ololube, N.P., & Ekwebelem, A.B., (2011). Appraising the performance of secondary school students on the WAEC and NECO SSCE from 2004 to 2006. *International journal of scientific research in Education*, 4(2), 105-114.
- [13]. Kumar, A., & Yadav, D. (2015). A Comparative Study of Academic Achievement Motivation of Senior Secondary Students. *Bhartiyam International Journal of Education & Research*, 4(3), 33-39.
- [14]. Kumari, K., & Qasim, S.H. (2015). A Study of Achievement Motivation in Relation to Academic Achievement of Higher Secondary Students. *Indo-indian Journal of Social Science Research*, 11(1), 56-59.
- [15]. Majzub, R.M., Bataineh, T.M., Ishak, M.N., & Rahman, S. (2009). The Relationship between Locus of Control and Academic Achievement and Gender in a Selected Higher Education Institution in Jordan. Retrieved from <https://pdfs.semanticscholar.org>
- [16]. Mohamed, A. A., Mohammed, M.A., & Ahmed, H. (2018). Relation Between Locus of Control and Academic Achievement of Nursing Students at Damanshour University. *IOSR Journal of Nursing and Health Science*, 7(5), 1-13.
- [17]. Nworgu, B.J. (2015). *Educational Research: Basic Issues and Methodology* (3rd ed.). Nsukka Nigeria: University Trust Publishers.
- [18]. Ogunmakin, A.O., & Akomolafe, J.M. (2013). Academic Self-efficacy, Locus of Control and Academic Performance of Secondary School Students in Ondo state, Nigeria. *Mediterranean Journal of Social Sciences*, 4(11), 570-576. doi: 10.5901/mjss.2013.v4n11p570
- [19]. Ojewola, F.O., & Faremi, Y.A. (2018). Achievement Motivation and Parenting Styles in Promoting Effective Learning among Secondary School Students in Ondo State. *European Scientific Journal*, 14(4), 1857-7881.
- [20]. Okafor, E.O., Obi, J.S., & Oguzie, A.E. (2018). Relationship between Students' Self-esteem and their Academic Achievement in Imo State. *Hofa: African Journal of Multidisciplinary Research HAJMR*, 1(1), 24-32.
- [21]. Rahmani, P. (2011). The Relationship Between, Self-esteem, Achievement Goals and Academic Achievement among the Primary School Students. *Procedia- Social and Behavioural Sciences*, 29, 803-808.
- [22]. Rotter, J.B. (1992). Some Comments on the "Cognates of Personal Control". *Applied & Preventive Psychology*, 1, 127-129. doi: 10.1016/S0962-1849(05) 80154-4.
- [23]. Sepehrian, F.A. (2013). Self-efficacy, Achievement Motivation and Academic Procrastination as Predictors of Academic Achievement in Precollege Students. Proceedings of the Global Summit on Education. Retrieved from <https://worldconferences.net>
- [24]. Sharma, H.L., Pooja, (2018). Effect of Cognitive Styles and Achievement Motivation of 9th Grade Students through Multi-media and Traditional Instructional Strategies: An experimental Study. *International Journal of Management, IT & Engineering*, 8(12), 342-356.
- [25]. Singh, K. (2011). Study of Achievement Motivation in Relation to Academic Achievement of Students. *International Journal of Educational Planning & Administration*, 1(2), 161-171.
- [26]. Sontakke, J.P. (2016). Achievement Motivation and Emotional Intelligence: A Correlational Study. *The International Journal of Indian Psychology*, 3(2), 125-128.
- [27]. Spector, P.E., & Fox, S. (2005). *The stressor – Emotion Model of Counter Productive Work Behaviour: Investigations of Actors and Targets*. Washington, DC: APA press.
- [28]. Squier, K.L. (2016). Self-efficacy. Retrieved from <http://www.excellenceinschoolcounseling.com>
- [29]. Steinmayr, R., Mibner, A., Weidinger, A., & Wirthwein, L. (2015). Academic Achievement. Retrieved from <http://www.oxfordbibliographies.com/view/document/obo-9780199756810-0108.xml>
- [30]. Tamannaifar, M.R., & Gandomi, Z. (2011). Correlation between Achievement Motivation and Academic Achievements in University Students. *Education Strategies in Medical Sciences*, 4(1), 15-19.
- [31]. Turker, M.V., Inel, M.N. (2012). The Effect of Locus of Control Orientation on Perceived Individual Innovativeness: An Empirical Research in Turkey. *Procedia-Social Behavioural Science*, 58, 879-888.
- [32]. Ugwoke, J., (2017). Factors affecting the enrollment of Students in Chemistry education in colleges of education in Enugu State [Blog post]. Retrieved from http://academicpower.blogspot.com/2017/08/factors_affecting_enrollment_of.html?m=1
- [33]. WAEC Chief Examiner's Report (2013-2019). Retrieved from <https://waeconline.org.ng/e-learning/chemistry/chemmain.html>

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