

## **PREDICTIVE VALIDITY OF UNIFORM EXAMINATION FOR SENIOR SCHOOL CERTIFICATE CHEMISTRY EXAMINATION OF STUDENTS IN PUBLIC SECONDARY SCHOOLS IN ENUGU STATE**

**CHIEDU CHARITY IFEOMA, PROF. A. C. IFEAKOR & DR CHIKODILI OBI- EZEANI,**

### **Abstract**

*The study investigated the predictive validity of uniform examination for senior school certificate chemistry examination of students in public secondary schools in Enugu State. The study was guided by two research questions and two null hypotheses. Correlational research design and expo facto design were used for the study. The population of the study comprised 836 SS II students who participated in Uniform Examination in Enugu State in the year 2018, 2019 and 2020 and their corresponding Senior School certificate examination in 2019, 2020 and 2021. A Sample size of 836 SSII students were used for the study and enumerative census method was used for the study since the researcher can manage the population. The instrument for data collection was Profoma that enabled the researcher to get students past SSCE results from Post Primary School Management Board and past uniform examination scores from Education Development Centre. The SSCE performance scores were valid since they were derived from standardized test and also the SS2 UE was standardized since it was set by Education Development Centre and was taken by all SS2 students and marked with the same marking scheme by other teachers from other school. Here both the school and teacher factors were kept constant and there was also conference marking to obtain valid and reliable results. Copies of SS2 UE scores were reliable since they were existing records that were used as collected. Data obtained for the study were analyzed using simple regression to answer the research questions and test all the null hypotheses at 0.05 level of significance. Statistical Package for Social Sciences (SPSS) version 26 was used for data analysis. The study revealed among others that 2018 SS2UE significantly predicted 2019 SSCE chemistry result, 2019 SS2 UE did not significantly predict 2020 SSCE chemistry result, while 2020 SS2UE significantly predicted 2021 SSCE chemistry result. Based on the findings, it was recommended that SS2 Uniform Examination (UE) should be centralized in all states of the federation since it significantly predicted performance in Senior School Certificate Chemistry Examination.*

### **INTRODUCTION**

Education is the most veritable instruments for social and political mobilization and the acquisition of important technical skills. For these reasons, a substantial share of the nation's resources is invested in education which has witnessed and continued to witness a great explosion of knowledge; so much that new knowledge is discovered in every discipline of life, including Chemistry.

Chemistry is a branch of science and its genesis can be traced to certain practices, known as Alchemy, which had been practiced for several decades in various parts of the world, particularly in Middle East. Iwuagu (2019) defined Chemistry as the science concerned with the composition, structure and properties of matter, as well as the changes it undergoes during chemical reaction. It is a science subject which deals with the study of the structure and composition of matter. Melvyn and Alan, (2023) defined Chemistry as the science that deals with the properties, composition and structure of substance (elements and compounds), the reactions, transformations they undergo and the energy released or absorbed during those processes. It is a branch of science which deals with the study of nature, composition and properties of matter and the changes matter undergoes under different conditions. Furthermore, Chemistry is one of the basic sciences that is essentially needed for a nation's technological development. This is because many materials that are used in the society today are inventions resulting from practical works in Chemistry. There is hardly a branch of national economy which does not make use of the physical Chemistry techniques. For instance, Chemical analysis is important in controlling quality of raw materials, intermediate and finished products. Therefore, Chemistry as a subject offered at senior secondary school level in Nigeria takes a central position in science and technology.

The objectives of Chemistry curriculum at the senior secondary school level include to show Chemistry and its link with industry, everyday life benefits and hazards, and to provide a course which is complete for individuals not proceetion but a few. Chemistry education is required to meet up with increase in demand for science and technology by private and government establishments. Without effective Chemistry education, our nation will likely remain impoverished.

However, poor academic performance of students in internal and external examinations is a reflection of the problems and challenges facing the educational system in Nigeria (Ojukwu, 2016). For instance, students' percentage pass with credit and above in external examination like West African Senior School Certificate Examination (WASSCE) in the years 2016, 2017, 2018, 2019, 2020, 2021, 2022 were 23%, 31%, 22.94%, 38.98%, 34%, 30% and 39% respectively (WAEC Annual Reports from 2016 – 2019). In addition, students' interest in Chemistry has declined over the year, as most of the students find Chemistry lessons boring and difficult.

Many factors have been attributed to the observed poor performance and lack of interest in Chemistry by students. Some of these factors include the services and working condition of the teachers, poor school infrastructure and facilities, teaching method used by Chemistry teachers, and instructional materials etc. (Ahmed et al, 2015). The persistent poor performance might have also contributed to poor economy, poor industrialization, lack of job, starvation, high maternal and infant mortality rate, spread of disease and sickness, environmental unfriendliness, lack of peace and other problems in the society. This is because most of the materials that are used in the society are resources resulting from the practical/analytical work in Chemistry.

The West African Examination Council Chief Examiner's reports (2017-2023) have also consistently highlighted some of the difficult concepts/ topics the candidates performed poorly in to include reactant, products, reaction time and rate, collision theory, rate of chemical reaction, nature of substance concentration/pressure/and catalyst, reaction mechanisms, rate constant and rate laws, electrolysis, chemical equilibrium, mole, geometric isomerism, balancing chemical equations, IUPAC nomenclature, structure of organic compounds, Gay Lussac's law and solubility. The report also goes further to enumerate candidates' weakness as poor language expressions, inability to adhere to instructions, poor interpretation of questions, inability to tackle numerical questions, poor definitions, omission/wrong units, inability to write balanced equations, use of formulae instead of names, poor drawing skills, inability to read and interpret graph, inability to draw sensible inference from recorded observations. Kozma and Russell (2014) confirmed that the concept of chemical equilibrium is very difficult to understand. Adesoji and Kenni (2018) discovered that the students perceived thirteen out of twenty (65%) topics in Chemistry as difficult. The topics perceived to be difficult by students according to the study are reaction time and rate, collision theory, gaseous state and gaseous laws, organic Chemistry, structure and energy level of atom, qualitative analysis, quantitative analysis, rate of chemical reaction, chemical equation, and non-metals and their compounds, thermo Chemistry, nuclear Chemistry, and astronomical Chemistry.

Afazal and Md Abul (2021) opined that the most important factor for effective learning to take place in science is by the provision of positive and adequate formative and developmental feedback and introduction of role play. Eugene (2019) maintains that teachers are always under intense pressure to cover the curriculum and get students ready for external examinations. This makes teaching of Chemistry inadequate as special approach needed for the teaching of difficult Chemistry concepts are often overlooked. Learners therefore find the subject irrelevant to their daily experience and survival needs in their sociocultural and economic environment.

Despite the prominence and status given to Chemistry as a science subject and the increasing efforts of different governments in Nigeria to provide materials for its study, it is disheartening and unfortunate to observe that students' achievement in Chemistry in Nigeria is far from being satisfactory. In spite of many workshops and seminars organized by both Federal and State governments. Individual schools and teachers are not left out as they put extra efforts in organizing extra classes for their students. Parents on their part even seek for the services of private teachers for their children. In all these efforts, students still perform very poorly in internal and external examinations as confirmed by WAEC Chief Examiners' report over the years.

The students' poor performance in Chemistry affects the nation now and in the future on matters like economy, educational advancement, science and technology, politics, welfare, culture, even religious value because it is a sound mind that maintains values. To inculcate and maintain sound mind and values parents, stakeholders in education have been working relentlessly to make sure that their children or wards participate in Senior School Certificate Examination not minding the high cost of these examinations that is rising yearly. Upon all these efforts, students' performance in SSCE has not been impressive. This continuous poor results of SS3 students in SSCE in Enugu State prompted Education Development Centre, a parastatal of Ministry of Education in Enugu State in 2018 to come up with an intervention known as Senior Secondary School 2 (SS 2) Uniform Examination.

The uniform examination is done at both Junior Secondary School (JSS) and SS 2 levels across the state. This is an effort by the state to improve the standard of education at all levels and also to prepare and

present qualified students to SS3 in readiness for SSCE. The Uniform Examination comes at the end of the third term in SS2 and JSS2 respectively to qualify student into examination classes. Students that pass this SS2 Uniform Examination are the ones promoted to SS3 where they will register for Senior School Certificate Examination. This examination was introduced to help the teachers, ministry of education to select the best students for SS3 SSCE and also help their parents know whether or not their children are ready for SSCE and to avoid yearly funds wastage in patronizing the examination bodies. Other reasons for establishing uniform examination in Enugu State include the following: to ensure uniformity of standards among schools in Enugu State, to ensure complete coverage of subject syllabus in all schools in Enugu State before the examinations, to harmonize questions in various subject areas as among students of schools in Enugu State and to compare performance of students among the schools.

Thus, the SS2 Uniform Examination questions are answered by students of Enugu State and marked with common marking scheme. This examination last for three weeks and the results are made available to each school that participated in the examination at the end of SS2 third term to usher the successful students into SS3 in readiness for the SSCE. The result of the examination is validated to enable teachers ascertain the level of their students' readiness for the SSCE. Can this SS2UE results equally be used to predict performance in SSCE because in July 2017 Post Primary Schools Management Board did research on performance of students in SSCE in Chemistry from 2015 to 2016 in Enugu State and found out there were low percentage in 2005, 2006 and 2007 but started to improve in 2008 with tremendous improvement from 2016. The question is can this SS2UE that prepares and present students for SSCE be the reason behind it? However, this is only possible if the Uniform Examination has predictive validity. It is based on this assertion on SS2UE that the researcher engaged to find out whether it can predict performance in SSCE Chemistry. Information on the predictive validity of such examination will provide basis for taking decision on the desirability, or otherwise. That is SS2UE would serve as a basis for making inform decisions as whether to use the results of such examination in making decisions requiring forecast, such as predicting student' s success in SSCE (Ihechu, 2019).

Validity can be defined as the extent to which a test measures what it is supposed to measure. Predictive Validity is the degree to which the predictions made are confirmed by the later behaviour of the subjects. Prediction is generally used to refer to functional relation between instruments and events occurring before, during and after instrument are applied. There are some factors which may moderate (modify or alter) the predictive validity of any examination like the SS2 Uniform Examination. Such factors are called moderator variables. Moderator variables in this context can be referred to as a variable which change the degree of relationship between two other variables. The use of moderator variable is one approach to increasing reliability and validity in measurement. These factors include gender, school type and location. This study investigated gender, location and school type as moderating variables in the predictive validity of Uniform Examination on SSCE. Gender is an important variable in the school system. Gender means being male or female. In Enugu State both male and female students compete among themselves in school work irrespective of location and school type.

According to Sukola et al. (2016) gender issue is an important one in science education especially with increasing emphasis on ways of boosting manpower for technological development as well as increasing the population of female in science and technology fields. The role of gender in academic performance of students in the school subjects especially in Chemistry cannot be overstated. Spence as cited in Ajike (2019) found no significant influence of gender on the achievement of college students in Chemistry when they were exposed to Chemistry courseware online and traditional learning environment. Some studies revealed that male students perform better than the females in science subjects. Okwo & Otunba as cited in Ajike (2019) reported that boys performed better than girls in physics essay test. The gender moderator can be from school type in any location.

School location is another moderating variable considered in this study. School location means a particular area where a school is located. It can be rural or urban area. The effect of school location on students' performance cannot be overemphasized. Akpan in Ajike (2019) indicated that schools in urban areas have electricity, portable water supply, adequate teachers, more learning facilities and infrastructures which influence students' performance in the school. Awodun et al (2018) opined that the influence of location on students' academic achievement remains controversial and inconclusive. Caroline et al (2016) found out that there was significant difference between students in urban areas and rural areas that students in urban areas performed better than students in rural areas irrespective of school type.

School type was the third moderating variable. School type in this study means composition of the students in terms of gender in a particular school such as single sex school (boys only and girls' only schools)

while mixed sex schools or coeducational schools comprise both boys and girls. Kolawale (2014) observed that the students from Girls' schools had highest means score performance followed by students from mixed school and students from Boys' school had a lowest mean score. However, there was no significant mean difference between Single Boys and Mixed School at .05 level. It was observed that single Boys Schools and Mixed Schools had homogenous mean. Hence, there was significant influence of sex on the students' academic performance in Chemistry. The study noted that Examination Scores had strong predictive strength on final scores and there was significance difference between academic performance of students in Single Boys, Single girls and Mixed Schools as well as their performance in continuous assessment in comparison with the final score.

The findings negated the views of Adesoji and Kenni (2018) who revealed that students' performance in SSCE has nothing to do with whether is single gender school or co-education school. Adekunle (2016) observed that the students from Girls' schools had highest means score performance followed by students from mixed school and students from Boys' school had a lowest mean score. Adekunle in Byrd, Marks and Lee (2014) asserted that in coeducational

classrooms, boys receive the majority of teachers' attention, particularly in mathematics and science. Interviewing and observing students in single-sex mathematics classrooms in American secondary schools,

Adenkule (2016) found that the girls in a single-sex classroom had the sense of ownership of their class, while the same girls did not feel the sense of ownership in co-educational classrooms. Females also benefit from single-sex environments because sexual harassment is an unfortunate problem in coeducational environments. While the risk is still present in single-sex schools, some feel that the single-sex environment provides a safer environment for female students. It was also indicated that for males, Chemistry Scholastic Aptitude Test (SAT) scores were higher among those attending single-sex schools; while, for females, Chemistry SAT scores were higher for those attending coeducational schools. Since these students take the same Uniform Examination, there is need to investigate if the examination will predict SSCE grade differently for male and female students. Adekunle (2016) observed that the students from Girls' schools had highest means score performance followed by students from mixed school and students from Boys' school had a lowest mean score.

Location and gender with divergent and non- agreeing conclusion, there was need not only to determine the predictive validity of the uniform examination, but also the influence of school type, location and gender as moderator variables in the predictive validity of uniform examination.

In this present study, the SS2 Uniform Examination is used as a predictor on some criterion measures. It is quantified by the correlation co-efficient between two sets of paired measurement obtained for the same target population to indicate the degree of linear relationship between two variables, the predictor and criterion variables. Based on the above discourse, this study sought to determine if SS2 uniform examination predicts senior school certificate examination scores in chemistry.

### **Purpose of the Study**

The main purpose of this study was to investigate the Predictive validity of Uniform Examination scores on Senior School Certificate Chemistry Examination scores of students in public secondary schools in Enugu state. The study specifically sought to determine the :

1. The Predictive value in student's achievement SSCE Chemistry examination that can be attributed to their achievement in SS2 Uniform examination.
2. Regression model that can be used to predict student's achievements in chemistry with SS2 Uniform examination.

### **Research Questions**

Two research questions guided the study:

1. What is the predictive value in student's achievement in SSCE Chemistry examination that can be attributed to their achievement in SS2 uniform examination.
2. What is the regression model used to determine the predictive value of student's achievement in chemistry with SS2 Uniform examination?

### **Hypotheses**

The following two null hypotheses were formulated and test at .05 level of significance.

1. There is no statistically significant variation in student's achievement in SSCE Chemistry examination that could be attributed to their achievement in SS2 uniform examination.

2. There is no statistically significant moderating influence of gender on the amount of variation on student's achievement in SSCE Chemistry achievement that can be attributed to their achievement in SS2 uniform examination.

### Research Method

The area of the study is Enugu state, Nigeria. The study adopted correlational research design. The population of the study was 838 students which comprised of 400 males and 433 females in six education zones in Enugu state. The sample of 400 males and 433 females, 194 urban students and 639 rural students as well as 211 girls schools,

A total of 127 boys schools and 492 co-educational schools. Enumerative census method were used for the study. The instrument "Proforma" was used for data collection. The scores of SSCE and UE are valid since they are standardized test and also the scores are reliable since they were drawn from existing data. Simple regression was used to answer the research questions and test all null hypothesis at 0.05 level of significance of statistical package for social science version 26 was used for the data analysis.

### Data Analysis

**Research Question One:** What is the amount of variation in student's achievement in SSCE Chemistry examination that could be attributed to their achievement in SS2 uniform examination?

**Table 1: Predictive value of SS2 uniform examination on SSCE Chemistry results**

Year	Correlation(R)	R <sup>2</sup>	Adj R <sup>2</sup>	Remarks
2018	.541	.293	.290	Moderate positive
2019	.602	.363	.360	Moderate positive
2020	.814	.662	.660	High positive

Table1 showed the Predictive validity of SS2 uniform examination in student's academic achievement in SSCE Chemistry from 2018-2020. Table1 also showed that SS2 uniform examination has low positive Predictive influence on student's academic achievement in SSCE Chemistry results (R=.541). The SS2 uniform examination explained 29.3% of the total variability in 2018 SSCE results in chemistry in Enugu State. Furthermore, the SS2 uniform examination has moderate positive Predictive influence on student's academic achievement in 2019 SSCE Chemistry results in Enugu State (R =.602). The SS 2 uniform examination explained 36.3% of the total variability in 2019 SSCE results in chemistry in Enugu State. Finally, the SS2 uniform examination has strong Predictive influence on student's academic achievement in 2020 SSCE Chemistry results in Enugu State ( R= .814). The SS2 uniform examination explained ( R<sup>2</sup>= .662) 66.2% of the total variability in 2020 SSCE results in chemistry in Enugu state.

**Research Question Two:** What is the regression model that could be used to predict student's achievement in chemistry with SS2 uniform examination?

**Table 2: The mean intercepts and unstandardized Beta of Predictive validity of SS2 uniform examination.**

Year	Independent Variable	Dependent Variable	Mean Intercept	Unstandardized Beta(B)
2018	SS2UE	SSCER	30.283	7.401
2019	SS2UE	SSCER	34.399	6.406
2020	SS2UE	SSCER	26.896	8.883

Dependent variable= SSCE Chemistry results (SSCER) Independent variable= SS2 uniform examination ( SS2UE)

Regression model was constructed for each year using the mean intercept and the unstandardized Beta (B).

#### Year 2018 Regression model

Students achievement in chemistry=Intercept + SS2 uniform examination.

SSCE chemistry results= 30.283 + 7.401 SS2UE

The above regression model implies that for every 1 unit increase in 2018 SS2 uniform examination there is 7.41 increase in student's achievement in SSCE chemistry results in Enugu state.

#### Year 2019 Regression model

Students achievement in chemistry = intercept + SS2 uniform examination.

SSCE chemistry results = 34.399 + 6.406 SS2UE

The above regression model implies that for every 1 unit increase in 2019 SS2 uniform examination there is 6.406 increase in students achievement in SSCE chemistry results in Enugu state.

Year 2020 Regression model

Students achievement in chemistry = intercept + SS2 uniform examination

SSCE chemistry results = 26.896 + 8.883 SS2UE.

The above regression model implies that for every one unit increase in 2020 SS2 uniform examination there is 8.883 increase in students achievement in SSCE chemistry results in Enugu State.

### Test Of Hypothesis

**Hypothesis One:** There is no statistically significant variation on students achievement on SSCE chemistry examination that can be attributed to their achievement in SS2 uniform examination

**Table 6: Test of significance of Predictive validity of SS2 uniform examination on SSCE chemistry results**

Year	Variable	R <sup>2</sup>	B	SE	βeta	t	P-value	F	P-value	Remarks
2018	SS2UE	.541	7.401	.760	.541	9.742	.001	94.902	.000	S
2019	SS2UE	.602	6.406	.561	.602	11.420	.001	130.423	.000	S
2020	SS2UE	.814	8.883	.420	.814	21.171	.001	448.232	.000	S

Note: SS2UE = SS2 uniform examination.

2018 tolerance factor = 1, 2019 tolerance factor = 1, 2020 tolerance factor = 1

Table 6 showed that the amount of variation on students achievement on SSCE chemistry examination that could be attributed to their achievement in SS2 uniform examination in 2018 was statistically significant ( F = 94.902; p < .05). The unstandardized regression (B) of 7.401 implies that for every 1 unit increase in 2018 SS2 uniform examination there is 7.401 increase in SSCE chemistry results. The results also revealed that the standardized regression coefficient ( Beta = .541; t = P<.05) was statistically significant. Furthermore, the amount of variation on students achievement on SSCE chemistry examination that can be attributed to their achievement in SS2 uniform examination in 2019 was statistically significant ( F= 130.423; P< .05). The unstandardized regression (B) of 6.406 implies that for every 1 unit increase in 2019 SS2 uniform examination there is increase of 6.406 in SSCE chemistry results. The results also revealed that standardized regression coefficient ( Beta = .602 ; t = 11.420 ; P < .05) was statistically significant. Finally, the amount of variation on students achievement on SSCE chemistry examination that could be attributed to their achievement in SS2 uniform examination in 2020 was statistically significant ( F = 448.232 ; P< .05). The unstandardized regression ( B) of 8.883 implies that for every 1 unit increase in 2020 SS2 uniform examination there is 8.883 increase in SSCE chemistry results. The results also showed that standardized regression coefficient ( Beta = .814 ; t = 21.171; P < .05) was statistically significant.

**Hypothesis 2:** There is no statistically significant moderating influence of gender on the amount of variation on students achievement in SSCE chemistry achievement that can be attributed to their achievement in SS2 uniform examination.

**Table 7 : Test of significant of moderating influence of gender**

Year	Variables	R2	B	SE	Beta	t	P-value	F	p-Value	Remarks
2018	gender x SS2UE	.846	1.191	.104	.543	11.407	.001	189.958	.001	S
2019	gender x SS2UE	.888	.961	.091	.438	10.510	.001	283.359	.001	S
2020	gender x SS2UE	.893	.986	.088	.449	11.204	.001	296.448	.001	S

Note SS2U = SS2 uniform examination

2018 tolerance = .544 ; 2019 tolerance factor = .535 ; 2020 tolerance factor = .557

Table 7 showed that the moderating influence of gender on the amount of variation on students achievement in SSCE chemistry achievement that can be attributed to their achievement in SS2 uniform examination in 2018 was statistically significant ( F = 189.958 ; P < .05). The unstandardized regression ( B= 1.191) implies that for every 1 unit increase on the moderating influence of gender will result to 1.191 increase in students achievement in chemistry. The results also indicated that the standardized regression ( Beta = .543 ; t = 11.407; P < .05) was significant. Furthermore, the moderating influence of gender on the amount of variation on students achievement in SSCE chemistry achievement that can be attributed to their

achievement in SS2 uniform examination in 2019 was statistically significant ( $F = 283.359$ ;  $P < .05$ ). The unstandardized regression ( $B = .961$ ) implies that for every 1 unit increase on the moderating influence of gender will result to .961 increase on students achievement in SSCE chemistry. The result also showed that the standardized regression ( $Beta = .438$ ;  $t = 10.570$ ;  $P < .05$ ) was significant. Finally, the moderating influence of gender on the amount of variation on students achievement in SSCE chemistry achievement that can be attributed to their achievement in SS2 uniform examination in 2020 was statistically significant ( $F = 296.448$ ;  $P < .05$ ). The unstandardized regression ( $B = .986$ ) implies that every 1 unit increase in moderating influence of gender will result to .986 increase in students achievement in SSCE chemistry. The result also indicated that the standardized regression ( $Beta = .449$ ;  $t = 11.204$ ;  $P < .05$ ) was significant.

### **Discussion of the findings**

The findings on Predictive value of SS2UE on students achievement in SSCE chemistry revealed that 2018 SS2UE significantly predicted 2019 SSCE chemistry result while the 2019 SS2UE did not significantly predict 2020 SSCE chemistry result. 2020 SS2UE significantly predicted 2021 SSCE chemistry result. The study is similar with the finding of Faleye and Afolabi (2015) who revealed that three out of six schools investigated had relatively low but significant correlations between JSCE and SSCE results; Two schools had significant correlation between JSCE and SS2 results; Performance in JSCE English and Chemistry could be used to predict performance in English and Chemistry in SS2 and SSCE; overall performance in JSCE tend to have low capacity to predict performance in SSCE.

### **Conclusion**

The study investigated the Senior Secondary School two SS2 Uniform Examination as a Predictor of students' performance in SSCE Chemistry in Enugu State. Based on the findings of the study, the researcher made some conclusions. That 2018 SS2UE significantly predicted 2019 SSCE chemistry result. 2019 SS2UE did not significantly predict 2020 SSCE chemistry result while 2020 SS2UE significantly predicted 2021 SSCE chemistry result.

It was concluded that male students 2018 SS2UE scores were significant predictors of 2019 SSCE result. Likewise, female students of 2018 SS2UE scores were significant predictors of 2019 SSCE chemistry result. Male students of 2019 SS2UE were not significant predictors of 2020 SSCE chemistry result. In the same vein, female students of 2019 SS2UE were not significant predictors of 2020 SSCE chemistry result. Male students of 2020 SS2UE were significant predictors of 2021 SSCE chemistry result, while female students of 2020 SS2UE were significant predictors of 2021 SSCE chemistry result.

### **Recommendations**

Based on the findings of this study and their educational implications, the following recommendations are made:

1. There is need for periodic exposure of principals and teachers to workshops and seminars on the importance of SS2 Uniform Examination (UE) as to continue to enhance Senior Secondary School Certificate Chemistry Examination scores in Enugu State.
2. SS2 Uniform Examination (UE) should be generalized in all states of the federation since it significantly predicted performance in School Certificate Chemistry Examination.
3. SS2 Uniform Examination (UE) should be made compulsory for SS2 students intending to sit for SSCE in Nigeria not only in public schools but also in private schools, since it has been found to be helpful to students
4. Teachers of SS3 should be encouraged to use the performance of students in SS2UE as a feedback assessment in the classroom to equip the students out from their weak areas. Students should also take SS2UE seriously since it has high positive impact on SSCE performance.
5. Students should also take SS2UE seriously since it has high positive impact on SSCE performance.

## REFERENCES

- Adekunle, T. O. (2016). Location and Gender as Predictors of Students' Performance in WASSCE Multiple Choice Test in Biology. Department of Educational Foundations, Faculty of Education, Federal University Dutsinma, Katsina State, Nigeria.
- Adesoji, F.A & Keni, A.M. (2018). Continuous Assessment, Mock Examination Results and Gender as Predictor of Academic Performance of Chemistry student in WASSEC and NECO. *Nigeria Journal of professional Teachers*, 3(2), 34-78.
- Afzal S.M & Md Abul K. (2021). Teaching and learning process to enhance teaching effectiveness: a literature review. *International journal of Humanities and Innovation*, 4(1), 1-4.
- Ahmed, A.H, Hassan I.A., Abdullallah, A.S., Asia, M.K., Yussuf, N. E., Ali, A.A (2015) Factors affecting students' performance in Chemistry: case study in Zanzibar secondary schools. World academy of science, Engineering and technology. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*. 9(11), 4016 -4023.
- Ajike, U.K. (2019). Senior secondary school two centrally set examinations as a predictor of students achievement in senior school certificate mathematics examination in abia state. *M.Ed Thesis* Dept. of Science Education, Michael Okpara University of Agriculture Umudike.
- Awodun, A.O., & Oyeniyi, A.D. (2018) Influence of school location on students' academic achievement in junior secondary school basic science in Ekiti state, Nigeria. *Journal of emerging technologies and innovative research*, 5(6), 125-129.
- Caroline, A. O, Grace, A, & Christy, O. O (2015). The Influence of Gender, School Location and Socio-Economic Status on Students' Academic Achievement in mathematics. Department of Educational Foundations and Administration, College of Education Warri, Delta State Nigeria 6(17), 119-130.
- Eugene U. O. (2016). Influence of Gender and Location on Students' Achievement in Chemical Bonding, *Journal of Applied Sciences*, 2(12), 122-139.
- Federal Republic of Nigeria in its National Policy on Education FRN, (2017).
- Ihechu, K.J.P. (2019). Differential Item Functioning of National Examination Council (NECO) and National Business-Technical Examination Board (NABTEB) Agricultural Science Multiple Choice Test Items (2015-2017) in South East. *PhD Dissertation*. Dept. of Science Education, Michael Okpara University of Agriculture Umudike.
- Iwuagu, M.U. (2019). Challenges of scientific research in Nigeria. Paper presented at the annual award of the chemical society of Nigeria, Anambra state chapter College of Education (technical).
- Kolawole, E.B. & Ala, E. A.O. (2018). Effect of continuous assessment and gender on students' academic performance in mathematics in some selected states in the south west Nigeria Faculty of Education, Institute of Education, Ekiti State University, AdoEkiti. *International Research Journals of Education*, 3(5), 34-67.
- Kozma, R & Russell, J. (2018). Multimedia learning of Chemistry. [http://chemsense.org/about/papers/Rozinarussell//multimedia 200 4pdf](http://chemsense.org/about/papers/Rozinarussell//multimedia%2004.pdf).
- Melvyn, C.U., & Alan, J.R., (2023). Chemistry: Science and tech. Britannica. <https://www.britannica.com>. [Updated Nov3, 2023][Accessed Nov 14, 2023]
- NASA. (2018) Science Mission Directorate's, highlights for fiscal year 2018
- National Root Crops Research Institution (2017). Geographical location of the South East zone of Nigeria.
- Nworgu, B.G. (2015). *Introduction to Educational Measurement and evaluation: theory and practice* (2nd ed.). Hallman Publisher.
- Ojukwu, M.O (2016). Perception of students on causes of poor performance in Chemistry in external examinations in umuahia North local government area of Abia state. *International journal of education & literacy studies*, 4(1) 67-73.
- Okwo, F.A. & Otunba, S. (2017). Influence of gender and cognitive styles in science achievement in physics essay test. *Journal of Science Teachers Association of Nigeria*, 42 (1&2), 85-88.
- Sukola, I.T., Abdulmalik.S., & Yunusa, M.M. (2016) Comparative analysis of gender performance in biology, physics and chemistry among pre-degree students of federal university, Dutsinma. *International journal of educational Benchmark*, 5(1), 108-118.
- World Health Organization (2016). Gender and reproductive rights: Working definitions. Retrieved June 15, 2017 from <http://www.ericdigest.org/2002>