

Determinants Of WAEC Chemistry Examination Failure Among Senior Secondary School Students In Maiduguri Metropolis

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Abstract: Low percentage of the candidates that meet the university admission requirements have been of a great concern to the educational sectors as well as teachers. Apart from the fact that mass failure of students in public examinations constitutes wastage on investment in secondary education, it puts a big question mark on the quality of secondary education in the country. Each time the results of students in Senior school Certificate Examination (SSCE) are released, it has been a tale of woes and national embarrassment. This situation is so pathetic that stakeholders keep on wondering why this level of education has persistently failed to meet the yearnings and aspirations of the society. Within the context of science education, chemistry has been identified as a very important school subject and its importance in scientific and technological development of any nation has been widely reported. It was as a result of the recognition given to chemistry in the development of the individual and the nation that it is made a core-subject among the natural sciences and other science related courses in the Nigerian education system. Chemistry and indeed chemists are linked to everything on earth as aptly captured in a slogan: what on earth is not chemistry? Chemistry plays a pivotal role in engineering sustainable economic development and growth in any nation. The poor achievement of student in chemistry has continued to be a major cause of concern to all, particularly those in the mainstream of chemical education in Nigeria. Over the years, students pass out with low grade level from WAEC Chemistry Examinations, the question is: what are the factors contributing to these negative phenomena (mass failure) in Chemistry. In order to answer this question, the researcher found it necessary to carry out a study on factors contributing to WAEC Chemistry Examination failure in Maiduguri Secondary Schools. The research was guided by three objective and three hypotheses. The result of this finding reveals that; there is significant difference among factors contributing to WAEC chemistry examinations failure; that there is significant fit between the measurement model and the data.

Keyword: Self-concept, Academic Performance of Remedial Arts Students

I. INTRODUCTION

One of the major problems facing the educational system in Nigeria is the abysmal failure of students in public examinations, particularly at the secondary level of education. According to Uduh (2009), the high percentage of candidates who failed WASSCE yearly is reflected in the low percentage of the candidates that meet the university admission requirements. The situation is so pathetic that stakeholders keep on wondering why this level of education has persistently failed to meet the yearnings and aspirations of the society.

Apart from the fact that mass failure of students in public examinations constitutes wastage on investment in secondary education, it puts a big question mark on the quality of secondary education in the country. Each time the results of students in Senior school Certificate Examination (SSCE) are released, it has been a tale of woes and national embarrassment.

Within the context of science education, chemistry has been identified as a very important school subject and its importance in scientific and technological development of any nation has been widely reported. It was as a result of the

recognition given to chemistry in the development of the individual and the nation that it is made a core-subject among the natural sciences and other science related courses in the Nigerian education system. Chemistry and indeed chemists are linked to everything on earth as aptly captured in a slogan: what on earth is not chemistry? Chemistry plays a pivotal role in engineering sustainable economic development and growth in any nation. Put succinctly, there is no aspect of human endeavor on natural phenomena that chemistry does not feature. It features prominently in the areas of oil and gas, agriculture, health, environment, solid minerals, textile, cosmetics, water supply, sanitation, crime detection, paper, waste management, just name it (Oloruntelge, 2000). Chemistry is the catalyst of sustainable national growth and development. Chemistry is offered at the senior secondary classes in order to help student learn important aspects of scientific concepts that would enable them live effectively in their immediate environment (Jimson, 2013). Despite the importance of chemistry and its educational value which is relevant to the need of individual learners, economic and technological breakthrough of a nation and the effort of researchers to improve on its teaching and learning, the performance of students in the subjects is not still encouraging, this shows that the level of performance is still not good enough. The poor achievement of student in chemistry has continued to be a major cause of concern to all, particularly those in the mainstream of chemical education in Nigeria (Olagunju, Adesoji, Ireogbu&Ige, 2003) and (Adesoji&Olatunbosun, 2008).

In Nigeria and perhaps throughout the world, there is a well-established tradition in secondary schools and that is, once Mathematics and science subjects like Biology, Chemistry, and Physics have been taught, they have to be examined (Awofala, Awoyemi, Fatake&Nneji, 2012). Most times, these subjects are examined internally by the teachers who have been responsible for delivering the instructions. Sometimes, the subjects are examined by external bodies set up by Government for the purpose. Such external bodies in Nigeria include: the West African Examinations Council (WAEC), the National Examinations Council (NECO), the Joint Admission and Matriculation Board (JAMB), and the National Business and Technical Examinations Board (NABTEB). Each of these bodies assesses students' learning in a particular subject based on the prescribed syllabus. The achievements of students in Chemistry may be moderated by the extent to which students attribute success or failure to internal or external factors, i.e., factors under or not under their control. This attribution, called locus of control, has been extensively investigated using (Rotter, 1996) that identifies respondents as either "internals" or "externals". Internals believe that events primarily result from their own behaviour and generally perceive themselves as having a high degree of control over their lives. For instance, success on a chemistry test is attributable by internals to their effort or hard work. Externals believe that events primarily are the result of chance or someone else's actions and perceive themselves as being influenced largely, if not wholly, by external factors. In an academic setting, an external would likely consider failure on a chemistry test to be the result of an unfair test (teacher's fault, for example).

Factors that have been identified to be responsible for poor achievement in chemistry are poor methods of instruction, teacher attitude (Agoro, 2002), laboratory inadequacy, poor science background (Adesoji, 1999) and non-availability of effective teaching and learning resources in classrooms (Agoro, 2002) among others. Despite huge investment of the stakeholders in this sector, the performance of students continue to be generally poor as a result of many other underlying factors. A student's performance in an examination is dependent on many variables. Such variables may include the type of school and its facilities, the qualification of teachers, the students' academic background, the environment from which they come, and parentage. This implies that the causes of mass failure in chemistry WAEC examinations is multi-dimensional in nature.

The school system has its own share of the blame for poor academic performance of students. According to Kraft (1994) and Etsey (2005), the causes of poor academic performance traceable to the doorsteps of the school were large class size, limited teaching materials, and inadequate textbooks.

II. STUDENTS' ATTITUDE/PSYCHO-SOCIAL FACTORS

Considerable research evidences abound to show that students are responsible for their poor academic performance. Akinboye (1985), Bakare (1994), Aremu&Sokan (2003) found out that the students' factors of poor academic performance were poor study habits, psychological adjustment problems, lack of interest in school programme, low retention, association with wrong peers, low achievement motivation and emotional problems. Other studies (Salami, 2004; Etsey, 2005; Karande& Kulkarni, 2005; Ong, Chandram, Lim, Chem&Poh, 2010 and Ajayi&Ekundayo, 2010) have shown that students' lack of financial support, absenteeism, truancy, use of local language in the classroom, lack of interest and joy in teachers' lessons and learning disability cause poor academic performance of students. Other causes include low cognitive ability, gender, prematurity, medical problems and inability of students to understand examination questions.

Students' beliefs and attitudes have the potential to either facilitate or inhibit learning. Burstein (1992) in a comparative study of factors influencing mathematics achievement found out that there is a direct link between students' attitudes towards mathematics and student outcomes. Studies carried out have also shown that the teachers' method of teaching mathematics and his personality greatly accounted for the students' positive attitude towards mathematics and that, without interest and personal effort in learning mathematics by the students, they can hardly perform well in the subject (Olatunde, 2009). This may also be the case in chemistry.

Students' attitude toward the learning of chemistry is a factor that has long attracted the attention of researchers. Ojo (1989) and Adesokan (2002) asserted that in spite of realization of the recognition given to chemistry among the science subjects, it is evident that students still show negative attitude towards the subject, thereby leading to poor performance and low enrolment. According to Bassey, Umoren and Udida (2008), students' academic performance in

chemistry is a function of their attitude. Papanastasiou (2001) reported that those who have positive attitude toward science tend to perform better in the subject. The affective behaviours in the classroom are strongly related to achievement, and science attitudes are learned (George & Kaplan, 1998).

Various studies had shown that successful performances of candidates in public examinations may be hindered by some psycho-social factors such as emotional disposition of candidates prior to and during examinations, poverty, ignorance, poor self-concept, ill-health or sudden sickness and poor study habit. Students' creative tendency and routine tendency help them to explore the unknown and to invent something new or to consolidate what they have already known. When such tendencies are disturbed or upset, they arouse emotions of anger and hostility in them (Oladele, 2005). In the same vein, when a candidate is suffering from colds, toothache, constipation, indigestion, poor eye-sight or hearing

III. TEACHERS' ATTITUDE/TEACHER – RELATED FACTORS

The importance of teachers in the educational attainment of the students cannot be overemphasized. The quantity and quality of instructional delivery by the teacher will, to a large extent, determine the academic performance of the students. This perhaps usually prompt some parents to enroll their children in private schools where better academic performance appears to be guaranteed as a result of more supervision and higher quality of instructional delivery. Therefore, poor academic performance of students is largely blamed on the teachers who are regarded as the custodian of knowledge, skills and values required by the students to excel in various aspects of life (Ajayi&Osali, 2013).

Various causes of poor academic performance of students which are attributed to the teachers were non-use of verbal reinforcement strategy and lateness to school (Morakinyo, 2003), poor interpersonal relationships (Aremu&Sokan, 2003). Others include absenteeism, inability to complete the syllabi and less interest in children's understanding of lesson (Etsey, 2005) and poor methods of teaching (Asikhia, 2010). Ajayi&Ekundayo (2010) also identified incessant strike, poor methods of teaching, teachers' inability to cover syllabus and teachers' lack of resourcefulness in teaching as causes of mass failure of students in public examinations.

Three major teacher-related factors were advanced regarding poor performance of candidates in Chemistry examinations. These are:

Shortage of teaching personnel and other resources is a hindrance to effective teaching and learning of technical and vocational subjects. Lack of relevant textbooks written in Nigerian context also constitutes an attendant factor militating against teaching and learning of technical and vocational subjects. The study of factors leading to poor performance Trend In Mathematics and Sciences Study (TIMSS) 2003 by Botswana Students exposed to computers carried out by Mbako in 2009 to survey the level of competency of her Form One students compared to students of other countries revealed

that the shortage of computers in most schools had led to inproficiency in the subject.

Teachers were de-motivated by large class size to offer individualized assistance particularly to the slow learners as articulated by a student: "if we do something wrong, our teacher does not help us. If we ask for help, our teacher does not come to help, and he continues speaking to those who know how to use a computer" (Mbako, 2009). This large class size syndrome makes teachers to become impatient and resort to showing by doing for the learners rather than showing them how to do it (Mbako, 2009; Nir-Gal and Klein, 2004; Thomas, Davis & Kazlauskas, 2007 and Christman and Budgett, 2003). These researchers observed that those students receiving help and guidance from teachers performed better than those who did not.

According to Adeyegbe (1993), it is right to assume that the effective implementation of the curricula and teaching of the syllabi contents rest on the caliber of teachers handling them. It therefore, follows that such teachers must be sufficiently knowledgeable in the discipline they profess to teach. Observation has however shown that most of the chemistry teachers barely edge their students in the knowledge of the subject matter. Adewuni (1995) posits that a number of key concepts perceived difficult by the teachers are being ignored by them while teaching. Hence they fail in covering the entire contents of the syllabi before presenting their students for May/June, West African Examinations Council Senior School Certificate Examinations. Such students therefore stand at disadvantage to be able to perform well in their examinations. Experience has equally shown that some Chemistry Teachers devote little attention to the teaching of practical aspects of their subjects. It is evident that for candidates to perform well in WAEC conducted Chemistry examinations, they must be skilled enough or proficient in the practical aspects of chemistry. Thus, the teachers' attitudes towards their subject's syllabi have direct and significant relationship on the performances of their students. To say the least, poor attitudes of the teachers result in poor performances of the learners and vice versa.

The dearth of personnel and other teaching resources, teachers' attitudes as well as large class size do not only affect the quality of teaching but translates to low achievement of the expected skills (i.e. poor learning outcomes) which has resultant effect on the performance of the students in chemistry examinations.

IV. SCHOOL/INSTITUTIONAL FACTORS

The institutional environment or organizational characteristics have been considered in other research. Studies indicate student feelings of alienation may be greater in tertiary institutions. Tomlinson-Clarke and Clarke (1996) found that male students experienced more alienation and expressed more uncertainty than female counterparts in their decision to continue their studies. Students who lived in hostel were shown to have a greater sense of community and higher retention rates in their studies (Lounsbury and DeNeui, 1995; Thompson, Smairededu, and Rafter, 1993). Berger and Braxton (1998) showed that institutional communication,

fairness in policy and decision making, and participation was positively related to social integration and had significant indirect effects on student retention as well as their performances in public examinations (Berger and Braxton 1998). Others believed that the quality of a students' experience in the classroom was central to their retention and performances (Tinto 1997; Ritschel 1995). Most Science Secondary Schools in Nigeria are under-equipped or ill-equipped in terms of workshops and laboratories facilities. This inadequacy in number of workshops and laboratories with ill-equipped facilities has been responsible for insufficient acquisition of required skills for candidates to scale through in the Senior School certificate examinations.

V. PARENTS ATTITUDE/HOME FACTORS

Parents play significant roles in the education of their children and wards. Apart from the fact they pay school fees and other levies, they buy textbooks, uniforms and other materials required by their children and wards. In addition to this, they are expected to supervise their academic works and give them good moral training. They are also expected to visit schools from time to time to find out how their children and wards are behaving with a view to taking corrective measures where and when necessary. However, the failure of parents to play these roles could negatively affect the academic performance of the students (Ajayi&Osali, 2013).

Studies have shown that the poor academic performances of students are caused by the parents. According to Ajala&Iyiola (1988), polygamous families contributed to poor academic performance of the students. Parents' inability to provide breakfast, textbooks and basic school needs for their children, less interaction with children's teachers and less involvement in the Parents-Teachers Association (PTA) resulted in poor academic performance of students (Etsey, 2005). Akanle (2007) also identified insufficient parental income and family type as causes of poor academic performance. Moreover, other causes of mass failure of students in public examinations that could be traced to the parents include lack of proper guidance by parents, failure of parents to provide necessary materials for their children to work with in school and family breakdown (Ajayi&Ekundayo, 2010).

Some parents are over protective and over anxious about their children performances. This attitude on the part of the parents can disturb the smooth emotional development of their children. Similarly, parents who spoil their wards and refuse to make them grow are also breathing emotional instability in them. This may result in the children becoming antisocial or aggressive hence, such children attention would be diverted from studying to antisocial behaviours such as smoking and drinking to mention but a few. Similarly, socio-economic status of the family to a great extent affects academic performance of children. A child from a poor Socio-Economic Status may not be exposed to such complementary academic related activities which in most cases aid students' understanding and mastery of subject matter. Many parents in Nigeria cannot afford to send their children to the well-established schools where relevant skills can be acquired. This

inhibits such children from performing well in chemistry senior secondary certificate examinations. The parental perception about Science education also contribute significantly to the level of performance of candidates in public examinations. Definitely, a parent who has no flair for Science Education will never encourage his or her child who is a student of such a college. However, such parents expect their children to have good results in their certificate examinations. This expectation propels both the parents and their children into sordid and unscrupulous acts that constitute examination malpractices. It is alarming to find parents conniving with unscrupulous Principals/Proprietors of schools and examination personnel in getting their children pass at all cost.

VI. PEER GROUP INFLUENCE

According to Castrogiovanni (2002), a peer group is defined as a small group of similarly aged, fairly close friends, sharing the same activities. In general, peer groups or cliques have two to twelve members, with an average of five or six. Peer groups provide a sense of security and they help adolescents to build a sense of identity. Adolescents ask questions relating to social identity theory such as, "Who am I?" and "What do I want out of life?" Feeling part of a group, be it the stereotypical jocks, goths, or punks, allows adolescents to feel like they are on the way to answering some of these questions. Given that adolescents spend twice as much time with peers as with parents or other adults, it is important to study the influence or pressures that peers place on each other. Adolescents have always been exposed to peer influence, but the kinds of peer influence that they encounter have changed tremendously in the past years. Peers can influence everything from what an adolescent chooses to wear to whether or not an adolescent engages in drug related or other delinquent behavior. How does peer influence affect a student's motivation and engagement at school? It is assumed that peer influence can have both positive and negative effects on an adolescent's academic performance and socialization.

It was found that associating with friends who have a positive affect toward school enhanced students' own satisfaction with school, whereas associating with friends who have a negative affect toward school decreased it (Ryan, 2000). Landau (2002) stated that an adolescent's expectancy of success was the primary predictor of academic effort and grades. A sense of belonging and support of a peer group was also significantly associated with these outcomes. Through selection, some adolescents may place themselves in peer group situations that support or foster their achievement-related beliefs and behaviors. Others may place themselves in contexts that weaken achievement-related beliefs and behavior.

VII. STATEMENT OF THE PROBLEM

Over the years, students pass out with low grade level from WAEC Chemistry Examinations, the question is: what are the factors contributing to these negative phenomena

(mass failure) in Chemistry? The central theme of this study is that some factors have a significant effect on academic performance of students in WAEC Chemistry Examinations. Therefore, the statement of the problems is: what are the prevailing factors contributing to low students' academic performance in Chemistry?

OBJECTIVES OF THE STUDY

- The study was set to determine the following objectives:
- ✓ Determine factors contributing to WAEC Chemistry Examination failure.
- ✓ Determine measurement model fitness to the data.
- ✓ Determine relationship among the factors contributing to WAEC Chemistry Examination failure.

HYPOTHESES

- ✓ There is no significant difference among factors contributing to WAEC chemistry examinations failure.
- ✓ There is no significant fit between the measurement model and the data.
- ✓ There is no significant relationship among factors contributing to WAEC chemistry examinations failure.

SIGNIFICANCE OF THE STUDY

The factors or determinants of WAEC chemistry examination failure will be of significance to students, teachers, principals, parents and the government. Since a problem known is halve solved, it will give a sense of direction in tackling the issues related to failure in WAEC chemistry examinations.

SCOPE OF THE STUDY

The study covered Remedial Science students of University of Maiduguri, 2015/2016 academic session. The study was delimited to factors or determinants of WAEC chemistry examination failure.

VIII. METHODOLOGY

RESEARCH DESIGN

The design for this study is survey research design. Survey research design "is probably the best method available to social scientists who are interested in collecting original data, for population that is too large to observe directly" (Babbie, 1986, p. 204). The use of survey in the present study is justified since the study is descriptive and exploratory, and has individuals as the unit of analysis for assessment. The study was geared towards the development and validation of a model for assessing the determinants of students' failure in WAEC chemistry examinations among Senior Secondary School Students of Maiduguri, Borno State, Nigeria.

POPULATION AND SAMPLE

The population for the study were remedial science students of University of Maiduguri, Borno State who had written the WAEC chemistry examination. There were 3000 students who registered for the program in the 2015/2016 academic session. The sample taken out of 3000 were 341 which is about 10% of the population (Krejcie & Morgan, 1970). A self-designed questionnaire was administered to 341 remedial science students using random sampling out of which 304 were properly filled and returned.

RESEARCH INSTRUMENT

A self-constructed survey questionnaire containing 58 items on determinants of WAEC chemistry examination failure based on five cluster model was used to assess Remedial science students of university of Maiduguri. Exploratory factor analysis was used to investigate the determinants of WAEC chemistry examination failure based on the five components of the model: students' attitudes, teachers' attitude, school and governmental attitude, parental attitudes and peer group influence to provide evidence for reliability and validity.

METHOD OF DATA ANALYSIS

The statistical tools employed for this study were Factor Analysis and correlation. Factor analysis is an explorative analysis. It groups similar variables into dimensions a process called identifying latent variables. It however does not distinguish between dependent and independent variables. For this study, Factor Analysis was used to reduce information in a model by reducing the dimensions of the observations. First the reliability of the items were established section by section. Only items whose Cronbach Alpha was greater than .6 were extracted and then rotated. Next was the factor loadings of the items extracted and lastly was to establish the relationship between the factors that measure the determinants of WAEC chemistry examination failure among secondary school students. Pearson correlation coefficient was used to determine the relationship among the determinants of WAEC chemistry examination failure. It is a tool for establishing the degree and magnitude of relationship between two or more variables.

DATA ANALYSES AND RESULTS

H01: There is no significant difference among factors contributing to WAEC chemistry examinations failure.

Cronbach's Alpha was used to test the reliability of items included in the factors, which are identified in the factor analysis. This test is done to ensure that the measurements are reliable for further uses. The results of Cronbach's alpha test are shown in the in table 1a.

Factor	Variables	Cronbach's alpha	Corrected Item-total Correlation	Cronbach's alpha if Item deleted	F (sig.)
	ATT2		.412	.677	
	ATT3		.493	.677	

Student's Attitude	ATT5	.404	.678	
Teacher's Attitude	ATT6	.483	.668	
	ATT7	.705	.381	.680
	ATT8		.008	.736
	ATT9		.323	.688
	ATT10		.213	.704
	ATT13		.496	.662
	ATT14		.302	.692
	ATT20		.257	.699
	ATT21		.422	.673
	TAT26		.554	.646
	TAT27		.509	.661
	ATA28		.381	.699
	TAT29	.718	.564	.649
	TAT30		.413	.690
	TAT32		.314	.725
	CTR34		.399	.469
	CTR35		.418	.457
School Attitude	CTR37	.558	.143	.589
	CTR42		.314	.506
	CTR43		.315	.505
	CTR44		.239	.539
	PTC46		.221	.413
Parent Attitude	PTC51		.406	.254
	PTC52	.451	.402	.240
	PTC53		.088	.604
Peer Group Influence	PGF55		-	-
	PGF56	.349	-	-
	PGF58		-	-

Table 1a Cronbach's Alpha Test for items of factors (Source: The authors)

Table 1a: Measurement of Reliability Test using Cronbach's Alpha

Table 1apresents the Cronbach's Alpha indexes of all factors as greater than 0.6, and the corrected item-total correlation of all items are more than 0.30. Besides, Cronbach's alpha of each factor if any item is deleted is less than the factor's Cronbach's Alpha, as well as the significant of F test for each factor, a kind of test to make sure the suitability of using Cronbach's Alpha technique for the data, is less than 0.05. The more details of Cronbach's alpha for all these items done by SPSS are shown in the Appendix. . This finding has a significant difference from the Hypothesis H01, which states that there is no significant relationship among factors contributing to WAEC chemistry examinations failure. As such, the null hypothesis is thereby rejected. Implying that there is a significant relationship among factors contributing to WAEC chemistry examinations failure.

Factors	KMO	Cronbach alpha	Variance explain	Sig.
Student's Attitude	.692	.705	54.914	0.000
Teachers Attitude	.786	.718	59.383	0.000
School Attitude	.618	.558	55.896	0.000
Parent Attitude	.605	.451	68.444	0.000
Peer group influence	.514	.349	63.980	0.000

Table 1b: Summary of KMO, Cronbach Alpha and Variance explained

H02: There is no significant fit between the measurement model and the data.

Statements related to determinant factors of WAEC chemistry examination failure are sectioned into five major

categories. 1 to 24 of the questionnaire, were coded ATT1 to ATT24 comprising section A, designed to explore the attitude of students toward chemistry as a subject. TAT 25 to TAT 32 section B, are designed to explore teachers attitude toward teaching chemistry, CTR33 to CTR43 section C, were designed to explore schools' attitude toward provision of basic infrastructure and supervision for teaching of chemistry, PTC46 to PTC53 section D, designed to explore the parents attitude towards provision of basic text books and support for students of chemistry, whereas PGF54 to PGF56 section E, are designed to explore the influence of peer group on the study of chemistry.

The exploratory factor analysis (EFA) was used for the behavioral variables to identify which factors had a great influence on determinants of students' failure of WAEC chemistry in senior secondary schools. The requirements of factor analysis, which are mentioned in Chapter 3, are satisfied to reduce the variables. After some rounds of removing the unsuitable variables, the analysis results of the remaining variables were grouped into four factors (four factors of behavioral variables), at the Eigenvalue = 1.007, KMO = 0.786 (sig. = 0.000), % of total variance explained = 64.22%, and all factor loadings are more than 0.5. These indexes prove that factor analysis for these variables is totally suitable and acceptable. The result is presented in the *Table 1b*, and the more details of the analysis done by SPSS are shown in the *Appendix*.

Factors	Variables		Loadings	
	F1	F2		
Student's Attitude	ATT2: Chemistry is useful in my life		.775	
	ATT3: I enjoy chemistry theory lesson		.797	
	ATT6: I liked my chemistry teacher		.724	
	ATT8: I enjoyed other science subjects more than chemistry		.725	
	ATT21: I loved examination		.739	
Teachers Attitude	ATT22: I attended school regularly		.711	
	TAT26: My teacher employed different teaching strategies for different aspects of chemistry		.625	
	TAT27: The teacher- pupil relationship was commendable		.667	
	TAT28: My chemistry teacher was qualified and experienced		.850	
	TAT29: My chemistry teacher used a variety of assessment techniques		.632	
School Attitude	TAT30: I relied on my chemistry teacher to give me answers during examination		.648	
	TAT32: Most students choose chemistry in my school because they have no alternative		.833	
	CTR34: We had a well-equipped laboratory in my school		.722	
	CTR35: There were no adequate chemistry teachers in my school		.786	
	CTR37: My school was an unconducive environment for learning		.936	
Parent Attitude	CTR43: Government's lukewarm attitude towards education		.680	
	CTR44: My school received help and support from government, PTA		.403	
	PTC46: I found it difficult to study at home		.717	
	PTC51: I always had breakfast before going to school		.803	
	PTC52: I come from a polygamous of family		.724	
Peer Group Influence	PTC53: My friends influenced me to choose chemistry		.938	
	PGF54: Majority of the students spend little time studying chemistry		.792	

Peer group PGF55:Most of us students considered chemistry to be a difficult subject	.821
PGF56: I am always in the company of my friends	.810
PGF57: I studied chemistry with my friends	.762

Table 4.1b: Exploratory Factors Loadings of the Behavior of the Determinants of WAEC Chemistry (Source: The authors)

Table 1c: Exploratory Factors Loadings of the Behavior of the Determinants of WAEC Chemistry

As shown in the *Table 1c*, among the twenty four (24) variables measuring students' attitude only twelve (12) variables belong to section A, which are measured as the determinant of students' attitude towards chemistry. Among eight (8) variables measuring teachers attitude towards chemistry, only six (6) variables were accepted by the analysis, which means only six variable measures teachers attitude towards chemistry, also among thirteen (13) items which measure school related attitude towards chemistry only six (6) where factored as measure or determinant of school related attitude towards chemistry failure. Among eight (8) items measuring parents' attitude towards the teaching of chemistry, only four (4) items were factored as measurement or determinants. With regards to peer group influence, the result shows that only two factors were loaded in the first factor, which implies that only two of the item could be used as measures or determinant of peer group towards chemistry as a subject. From the foregoing, it could be seen that 28 items which comprised four factors fit into the model. The null hypothesis "there is no significant fit between the measurement model and the data" is therefore rejected.

H03: There is no significant relationship among factors contributing to WAEC chemistry examinations failure.

Variables	Correlation Coefficient	Sig. level	Decision
ATT	.835	0.050	S
TAT	.753	0.23	S
CRT	.830	0.020	S
PTC	.623	0.000	S
PGF	.303	0.000	NS

Table 1d: Relationship among factors or determinants of WAEC chemistry examination

The results of analysis on relationship among the determinants of WAEC chemistry examination failure revealed that there is significant relationship as seen in table 1d. The null hypothesis is therefore rejected. More detailed results of the analysis is presented in table 1e.

	ATT	TAT	CRT	PTC	PGF
ATT	Pearson Correlation	1	.835**	.753**	.830**
	Sig. (2-tailed)		.050	.023	.020
	N	305	305	305	305
TAT	Pearson Correlation	.835**	1	.618**	.693**
	Sig. (2-tailed)	.050		.045	.013
	N	305	305	305	305
CRT	Pearson Correlation	.753**	.618**	1	.949**
	Sig. (2-tailed)	.023	.045		.011
	N	305	305	305	305
PTC	Pearson Correlation	.830**	.693**	.949**	1
	Sig. (2-tailed)	.020	.013	.000	
	N	305	305	305	305
PGF	Pearson Correlation	.693**	.213**	.645**	.803**
	Sig. (2-tailed)	.013	.000	.011	.000
	N	305	305	305	305

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1e: Correlation Results

SUMMARY OF FINDINGS

- The results of the analyses of this study revealed that:
- ✓ There is significant difference among factors contributing to WAEC chemistry examinations failure.
 - ✓ There is significant fit between the measurement model and the data.
 - ✓ There is significant relationship among factors contributing to WAEC chemistry examinations failure.

IX. DISCUSSION

Akinboye (1985), Bakare (1994), Aremu&Sokan (2003) found out that the students' factors of poor academic performance were poor study habits, psychological adjustment problems, lack of interest in school programme, low retention, association with wrong peers, low achievement motivation and emotional problems. This is in agreement with the findings of this study that students' attitude is a determinant of WAEC chemistry examination failure.

Agoro(2002), mentioned factors identified to be responsible for poor achievement in chemistry as poor methods of instruction, teacher attitude laboratory inadequacy, poor science background (Adesoji, 1999) and non-availability of effective teaching and learning resources in classrooms (Agoro, 2002) among others. This is similar to the findings of the analysis on teacher attitudes and school factor. The study revealed that teachers and the school play a vital role in determining students' failure in WAEC chemistry examination.

Etsey (2005), observed that parents' inability to provide breakfast, textbooks and basic school needs for their children, less interaction with children's teachers and less involvement in the Parents-Teachers Association (PTA) resulted in poor academic performance of students. The findings of this study also revealed that parental attitude is a determinant of WAEC chemistry examination failure.

Ryan (2002) found that associating with friends who have a positive affect toward school enhanced students' own satisfaction with school, whereas associating with friends who have a negative affect toward school decreased it. The findings of this study revealed that peer group influence is not a determinant of WAEC chemistry examination failure

X. CONCLUSION

The test of hypothesis on difference among factors contributing to WAEC chemistry examination failure revealed significant difference among the factors. This is clearly seen in the analysis of the reliability of the items. Only items that contributed greatly to the reliability of the factors were extracted for further analysis.

The test of hypothesis on fit between measurement model and data revealed that there is significant fit. The data gave

two factor loadings which fit in very well to the model. There was no or cross loading among the variables.

The test of hypothesis on relationship among determinants of WAEC chemistry examination failure revealed that there is significant positive relationship. The correlation coefficients were all above .6 except for peer group influence which had .303 showing very low positive relationship. This implies that students' attitude, teachers' attitude, school factors and parental attitudes are determinants of WAEC chemistry examination failure.

XI. RECOMMENDATION

The following recommendations are made based on the findings of the study

- ✓ Students of chemistry should put in more effort and time into the study of chemistry to enhance good grades in WAEC examinations.
- ✓ Teachers should use various teaching methods and techniques to enhance better understanding of chemistry, cover the syllabus and motivate students to put in their best into the study of chemistry.
- ✓ Schools should provide the necessary infrastructure and supervision needed to enhance better teaching of chemistry in schools.

Parents are to provide text books and all the necessary materials and support to their children to enhance better performance.

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