INTERNAL EXAMINATION SCORES AS PREDICTOR OF EXTERNAL EXAMINATION ACHIEVEMENT IN SCIENCE SECONDARY SCHOOLS IN BORNO STATE

BY

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DEPARTMENT OF EDUCATION
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DECLARATION

I hereby declare that this research project has been written by me and that it is record of my research wok. It has not been presented in any previous submission for the higher degree to the best of my knowledge.

All quotations are indicated by quotation marks or indentation and the sources of information are specifically acknowledge by means of references.



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CERTIFICATION

This project report entitled "Internal Examination Scores as Predictor of External Examination Achievement in Science Secondary Schools in Borno State" by John Yuwana Jasini meets the regulation governing the award of the Master of Education Degree in Science of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to my beloved wife Margaret, daughter Ijanada, and son Ijai.

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My invaluable appreciation goes to THE LORD ALMIGHTY FATHER for His grace, Mercy and love to me, and for granting me the privilege, protection and support to undertake this programme.

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ABBREVIATIONS

C.A	=	Continuous Assessment
CESAC	=	Comparative Education Study and Adaptation Centre
CGPA	=	Cumulative Grade Point Average
CMS	=	Church Missionary Society
COSC	=	Cambridge Oversea Certificate
GCE 'OL'	=	General Certificate in Education, Ordinary Level
JAMB	=	Joint Admission and Matriculation Board
JSS	=	Junior Secondary School
JSSLE	=	Junior Secondary School Leaving Certificate
NERDC	=	Nigerian Educational Research and Development Council
NISP	=	Nigerian Integrated Science Project
NPE	=	National Policy on Education
NTI	=	National Teachers' Institute
SSS	=	Senior Secondary School
SSCE	=	Senior Secondary Certificate Examination
STAN	=	Science Teachers' Association of Nigeria
WAEC	=	West African Examination Council
WASC	=	West African School Certificate

DEFINITION OF TERMS

Academic failure:- This refers to performance that falls below a specified standard called the pass mark. In SSCE, the pass mark is usually fixed at 40% and performance that fall below this mark is regarded as a failure.

Assessment:- Assessment in this study means the methods, procedures and processes or measures employed to determine an individuals Status/behavior as a result of learning experiences.

Certification:- Refers to the use of assessment data to make a formal attestation to a learner's competence or performance, especially the level of success in an examination or as a license to practice a profession or trade.

Continuous Assessment:- Refers to the measures continually employed by teachers In collecting information about level of performance of students in the learning activities taken throughout the course/programme.

Formal Assessment:- This means assessment conducted in situations which have been set solely for that purpose, usually well validated tests or other instruments.

Informal Assessment:- Is the type of assessment carried out without prior notice or arrangement.

Ex post facto-research:- This refers to a research that is carried out after the programme has been completed.

Terminal Assessment:- Assessment carried out at the end of a course or programme.

CHAPTER ONE

THE PROBLEM

1.1 INTRODUCTION:

The history of science teaching in Nigerian secondary schools is relatively recent. As at the 1950s, the kind of science taught in secondary schools was that which emphasized the acquisition of factual knowledge. The instructional method was basically authoritarian since it involved students learning mainly through rote memorization and regurgitation of "facts", especially during examination (Ajeyalemi. 1990).

The missionaries that came to Nigeria in the eighteenth century brought along with them western education, but they did not embark on serious science teaching because of the huge financial costs involved in putting up and equipping science laboratories. The British colonial government in Nigeria, on the other hand, was interested in the governance of the people and therefore did not establish programmes just to cater for the educational needs of the Nigerian people (Fafunwa, 1985). The first purely Nigerian education ordinance was enacted by the colonial government in 1886. This was followed by the establishment of the first secondary school, the King's School (now King's College) Lagos in 1890. In later years, Queen's College was also established for females. These schools offered sciences up to the standard of the Cambridge University Senior Local Examination(Taiwo, 1975).

In 1960, Nigeria became independent. Since then, education has been regarded as an investment, receiving a huge financial expenditure. On the eve of independence, the Nigeria government sought for recommendations from various commissions (e.g. Ashby, 1960) on the post independence educational needs of Nigeria. The results of these commissions' recommendations have led to National Development plans and physical expansions of secondary schools. The expansion of the schools without corresponding provision for requisite facilities by the government and preponderance of untrained teachers and large class size led to open public criticism on the quality of education. This period therefore witnessed what Fafunwa (1984) called the falling standard of education. This value judgement was based on the performance of the students in public examinations.

Examination seems to be the greatest single parameter by which society judges the products of its educational system. The fact appears to reflect the tyranny of the cognitive component of the taxonomy of educational objectives (Bloom 1956) of any curriculum. The cognitive aspect of the curriculum is most emphasized and magnified than the affective and psychomotor objectives which are equally important. Classroom teachers, school principals, examination bodies, parents, ministries and learners themselves all base their judgements concerning the quality of educational outcome on performance at examination most of the time. Any pronouncement on pupils' performance in both the affective and psychomotor domains is made only at such time when public morality is being discussed or when technology is put to practical test.

Perhaps, this is one of the main reasons why candidates' performance in public examinations have received very close attention in the past decades, and the prevailing poor performances of students in public examinations, especially those set by the West African Examination Council (WAEC) has been a subject for comments from all sectors of the society that are anxious about what they call the falling standard of education, or poor performance in examination (Daily Times, July 24th, September 14th, 1987; National Concord, August 7th, 1987:16). Table 1.1 below shows the WASC\SSCE result from 1988-1995.

Table 1.1 Performance of candidates in SSCE from 1988-1995

YEAR	BIOLOGY			CHEMISTRY			PHYSICS		
	Number Sat	Number Passed	Percent Success	Number Sat	Number Passed	Percent Success	Number Sat	Number Passed	Percent Success
1988	89,342	8,309	9.3	34,508	7,143	20.7	26,297	8,284	31.5
1989	89,710	10,350	11.8	35,705	3,856	10.8	28,525	2,710	9.5
1990	190,386	22,466	11.8	80,059	3,282	4.1	63,161	13,074	20.7
1991	285,690	72,851	25.5	16,256	13,250	11.4	96,742	17,027	17.6
1992	335,582	99,919	28.1	140,856	26,763	19.0	122,809	20,141	16.4
1993	481,034	89,953	18.7	170,537	40,247	23.6	152,275	37,307	24.5
1994	508,384	57,956	11.4	161,232	38,212	23.7	146,000	21,462	14.7
1995	453,353	85,684	18.9	133,188	48,880	36.7	120,768	22,825	18.9
Total	**2,453,481**	**447,488**	**135.5**	**872,341**	**181,633**	**150.0**	**756,577**	**142,830**	**153.8**
Mean Success Rate	-	-	**16.9**	-	-	**18.8**	-	-	**19.2**

Source: The West African Examination Council, Yaba, Lagos.

Table 1.1 above shows the performance of candidates in SSCE from 1988-1995.

There has been concerted attempt at analyzing candidates' performance and searching for solutions to the problems of mass failures in the secondary schools. This study constituted one of such attempts and it addresses itself to finding the relationship between internal examination performances and those in the external examination. It also determine the extent to which the internal examination scores can be used to predict success of the students in the external examinations.

According to Ajayi (1987), "Failure at examination can be part of societal failure: A society that shuns academics and worships mediocrity and materialism will ultimately fail." He equally identified factors such as lack of mental maturation on the part of learners due to the reduction in schooling age; massive free education unaccompanied by requisite facilities; education background of the candidates admitted to secondary schools; loss of qualified and competent teachers through lack of promotion, retirement and retrenchment; cancellation of board facilities and economic recession as part of the societal factors that affect students' educational performance.

Obilade (1986) shared the same opinion with Ajiya and observed that mass failure is a result of changing values in society. There is hardly any motivation to perform well academically because there are cheaper and easier avenues of achieving 'greatness' in a corrupt such as:

- Apparent lack of recognition for hard working teachers or merit award.
- Over politicizing education and quota system distribution of personnel's.
- Poor funding of schools and feeding of students etc.

Ezewu (1987) found fault with the content, method, teachers, environment, guidance programmes, quality control, evaluation as well as the structure and processes of WAEC. His conclusion that, "rather than say that our children have failed, we should say that the nation failed our children", provide food for thought for every well-meaning Nigerian.

The history of public examination in Nigeria is intimately associated with that of the WAEC, though examinations in Nigeria predate the council (Akinwumiju and Orimoloye, 1987). The WAEC was set up in 1952 as a corporate body charged with the responsibility of conducting examinations required in the public interest in the Anglophone West African. In 1968, the Science Teachers Association of Nigeria (STAN) was invited by the WAEC to spearhead the movement for change in school science. Subject panels were set up which developed curricula in Biology, Chemistry and Physics for the Secondary Schools. This move partly led the Federal Ministry of Education to organise a National Curriculum Conference in 1969 under the auspices of the Nigerian Educational Council (now NERDC) at Ibadan. The conference was concerned mainly with giving a new direction to the structure and curriculum orientation of the educational system so as to meet the needs national development. A national policy on education was subsequently formulated in 1977 based on the recommendations made at the conference. The present 6-3-3-4 system of education is a follow-up of the national policy on education in Nigeria which give rise to physical expansion of secondary schools in the country. This new 6-3-3-4 educational system was stratified into six years of

primary Education, three years of junior Secondary, three years of Senior Secondary and four years of Higher Education. In 1970, STAN developed the Nigerian Integrated Science Project (NISP) for teaching in the Junior Secondary School and separate science curricula were developed jointly by STAN and WAEC for the teaching of science subjects in the Senior Secondary Schools. The Junior Secondary Schools are examined internally by each state of the Federation, while the WAEC examined the senior secondary through its certificate examination for Anglophone West Africa.

To facilitate a successful implementation of the two-tier secondary education system, the Nigerian government wrested the control of all schools from the voluntary agencies and private proprietors in 1978. It succeeded in taking over such schools with the hope that its full implementation should transform Nigerian into a technologically developed society in the near future. By 1982. The two-tier secondary education was pilot tested in the Federal Government Colleges and later by 1985, it was implemented at the state secondary schools.

The Junior Secondary was both pre-vocational and academic for all pupils completing the primary education. The academically fit students proceed to the senior secondary at the end of the three years in order to pursue academic courses. Subsequently, successful candidates go for higher education of various types. The major concern of this work is on the assessment in the second tier senior secondary education.

At the end of the three years of senior secondary education, students are examined by WAEC in two papers-Theory and Practical (or alternative to practical). In each of these science subjects, the two papers must be passed (which constitute 60%) for certification. The remaining 40% come from the continuous assessment scores. The researcher, who had taught one of the science subject at the senior secondary school level for ten years, and who had also been a WAEC Assistant Examiner consistently for ten years, observed that there is persistent poor performance of students in WAEC examinations. The same concern has been expressed by colleague, parents, government functionaries, and educationists and by students themselves in the media, at seminars workshops, and conferences. It has been an area of concern for researchers and educational planners who are concerned with the technological development of the country.(Ayorinde, 1987; National Conference on Mass Failure in Public Examination, 1986; Daily Times, July, 24th; September, 14th, 1987 and national Concord, August, 7th, 1987: 16). In the light of the foregoing, it is essential therefore to take a fresh look at the problems of evaluation of educational achievements.

An effective science assessment procedure requires that the teacher uses a wide variety of testing instruments. Besides the written class tests, there are other approaches that can be used for assessing pupils learning outcomes. These

include:- Assignments, Projects, Observations, Interviews, Questionnaires, and Other affective measures.

An assignment is an academic work given to students to perform, usually in their spare time. In the school situation, an assignment may be considered as home works even though some assignment role in science teaching. It sustain pupils' interest and motivation in the subject they are taught in the classroom while out of the classroom.

The project is an academic work given to students, or selected students our of variety of options in the curricular materials. Students are expected to complete such projects at their own time outside the school - scheduled classes. A project is a long-term assignment carried out by the students, it encourages teamwork and co-operation. It also serves as a means of motivating and sustaining students' interest. These are usually scored and the grades recorded.

Observation is the direct watching of events or persons by the students probably recording what is observed on certain predetermined skills and tasks. It is very important in recording laboratory or practical-skill exercises. Observation includes measuring, classifying counting, recording, etc.

The interview is composed of a component requiring a written response and some questions requiring oral response to be evaluated by

a panel of interviewers or an interviewer. The responses can be transformed into scores for recording. The interview, questionnaire, checklist and sociometry do not usually form part of the continuos assessment scores, because it measures non-cognitive aspects of learning, rather, they are used for diagnostic purposes.

In science education, numerous assessment methods and techniques are currently in use in the Nigerian senior secondary schools. They range from:

i. Written examinations in their different forms. These include essay type, short answer question, multiple-choice questions.

ii. Practical examinations conducted in the laboratories or as field works,

iii. Written tests, weekly tests, or oral tests/quizzes,

iv. Terminal/end-of-year examination

v. Problems to be worked out and solved at home as assignments or projects.

Teachers conduct these kinds of assessment internally in schools. They can also be regarded as continuous assessments. They account for pupils' performance throughout the period of schooling. The assessment is systematic, comprehensive and cumulative. Hence it is expected to be valid and can gives relatively accurate picture of the ability of each child. The scores so earned by the pupils are indicative of each child's level of attainment.

The regular testing of students in science classes involves the award of marks as a means of quantifying students' achievement. The suggested weight of scores at

each level of the secondary education as directed by the Federal Ministry of Education (1985) is

- First year senior secondary education (SS1) = 10%
- Second year (SS2) = 20%
- Third year (SS3) = 30%

This means, 10% of the subjects examined in year one is computed as continuous assessment, and the score obtained will be reflected in the final year assessment, that is, SS3. In the same way, 20% of the second years is computed, and finally, 30% of the third year's work as shown in table 1.2 below.

TABLE 1.2: Cumulative Continuous assessment

Year	CGPA	Weighted Score
SS1	10%	1.0
SS2	20%	2.0
SS3	30%	3.0
Total	60%	6.0

From above, at the end of the three senior secondary education about 60% of the total course work have been examined and recorded as cumulative continuous assessment. It is this scores that is sent to WAEC as continuous assessment out of which forty percent (40%) is computed as part of the final year assessment score by WAEC for overall certification.

At the end of the three years schooling, WAEC conduct an external examination for assessment and certification of all SS3 students. The examination usually comprises of two papers. Paper I is practical examination and paper II is essay and structured/multiple choice questions. The external examinations constitute 60% and the internal examination, 40%. They complement each other to give overall standing of the student for certification.

1.2 STATEMENT OF THE PROBLEM

The Senior School Certificate Examination (SSCE) is well validates. But one is not certain whether the internal examinations in form of Continuous Assessment (CA) enjoy the same level of validation. It is perhaps impossible to dispute the charges of human bias, favoritism or spurious approximation of scores, which may constitute an element of weakness in the internal examinations.

Although schools make efforts to ensure the credibility of the examinations they set for their students, yet the examination scores still passes through many hands which may constitute a major defect in their validation. There is a need therefore to investigate the relationship between internal and external examination, and to determine if the level of performance in the internal examination can be used to predict achievements in the external examinations. The researcher, having been teaching one of the science subject in the secondary schools for many years, and have been a WAEC assistant examiner for ten years, felt the need to conduct this study to determine the

usefulness of the internal examination scores in predicting students' external examination achievements.

1.3 PURPOSE OF THE STUDY:

The purpose of this study is to determine if:-

i. there is any relationship between internal and external examination scores.

ii. the internal examination scores can be used as a valid predictor of external examination achievements.

1.4 RESEARCH QUESTION:

This study attempts to provide answers to the question:

i. Does performance in the internal examinations relate to achievements in external examination when each science subject is considered?

ii. Can performance in the internal examination be used as valid predictors of performance in external examination among science secondary school students in Borno State?

1.5 HYPOTHESES

i. There is no significant relationship between the students' scores in Biology in the internal and external examinations.

ii. There is no significant relationship between internal examination scores in Chemistry and scores in the same subject in the external examinations.

iii. There is no significant relationship between the students' scores in the internal examination in Physics and their scores in the same subject in the external examination.

iv. The students' academic achievement in internal examination cannot be used as valid predictor of their achievement in external examinations.

1.6 SIGNIFICANCE OF THE STUDY:

Science education is the bedrock upon which the nation can build its scientific and technological development. Assessment in science education therefore, is an important step in achieving national educational objectives. It also helps the teachers to assess instructional objectives, and to select and use instructional materials and methods for science teaching thereby providing guidance for decision-making. If faithfully carried out, continuous assessment gives the students a good idea of their relative academic ability, and parents and guardians a knowledge of their children's achievements in schools. The quality of the continuous assessment exercises can then have positive impact on students' academic achievement in external examinations. Therefore the finding of this study should assist our educational planners and policy makers to develop strategies and policies that will adequately promote the administration of continuous assessment in scoring and grading to meet the external examination standard.

1.7 THE SCOPE OF THE STUDY:

This study covered six senior science secondary schools in Borno State. The population of the study constituted the senior secondary (SS3) students that sat for SSCE between the year 1993 to 1996. The science schools are chosen for this study because all the three separate science subjects (Biology, Chemistry, and Physics) and taught in these schools. Also laboratory facilities are fairly adequate and they have trained science teachers.

The study examines the continuous assessment and SSCE scores to see if the former can be used to predict achievements in the later. So only SS3 science students are considered in the study.

1.8 SUMMARY:

Students performance in examinations has become a very important determining factor for admission into the Nigerian educational system. It contains essential information about the students' rate of progress and growth, which can be used in making meaningful predications and decisions.

There is a definite tools or science assessment procedures with a variety of testing instruments. The scores earned by students through these numerous assessment methods are indicative of individual child's level of attainment. Hence it is expected to be valid and can give a relatively accurate picture of the ability of each child in examination process.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 INTRODUCTION:

The search for an explanation for students' poor performances in schools and public examinations continues to be one of the most topical issues in science education. The factors, which are generally believed to influence students' performance in the school, include: individual differences; family background; socio-economic status; the school environment, the curriculum. The quality and experience of teachers, as well as the general values of the society (Anderson, Spiro and Montague, 1997).

The system of assessment of science education currently in use in the Nigerian secondary schools is based on continuous assessment in the form of internal examinations, which make use of a variety of assessment procedures, and the senior school certificate examination conducted by WAEC. The internal examination covers all students' performance in class tests, take home assignments, projects, observations, either in practical field or laboratory works. The examination papers are internally set and marked by teachers within the school usually on departmental basis. The examination scores are moderated internally. The external examination SSCE conducted by WAEC, makes use of all the course contents of the syllabus for the three years of senior secondary schools. The examination items cover the cognitive and psychomotor(practical skills) domains of educational objectives. Its papers are externally set, marked

and moderated. The external examination scores are generally valued for comparing of standard in contrast to internal examination scores that may or may not differ widely from school to school,

The school assessment strategy appears to have been specified by the Federal Government as one of the various measures to implement the National policy in Education (NPE) in 1977, when the policy was first formulated. Section 1, subsection 7.7 of the policy material states that "educational assessment and evaluation will be liberalized by based them in whole or in part on continuous assessment of the progress of individual" (NPE, 1981 revised). Many justifications have been advanced for the assessment of students' academic performances. The works of Rowntree (1987), Kempa (1988), and Satterly (1989) suggest that justification for assessment would include:

- Provision of feedback to students about their progress;
- Provision of feedback to teachers about students' progress;
- Provision of intrinsic motivation;
- Use in selection for further education or employment;
- Avenue for monitoring of standards, and
- Use as a form of curriculum control.

Whatever the purpose of the assessment measures used in internal and external examinations, it can be narrowed down to two areas: namely, the short term measure or specific objective which can be achieved at the end of a lesson/class work/laboratory work, and the long term measure, which is the broad objective which can be determined after a course or a programme of study. For instance,

the West African Examination Council (WAEC) examination syllabus has specified objectives for teaching each topic and sub-unit. They are referred to as assessment objectives whereas the National Policy on Education has broad aims and objectives for education. They are referred to as "educational goal". Since it would not be possible to study every aspect of internal versus external examination indicated by the various researchers mentioned above or else where in this study, the present investigation has restricted himself to the following areas:

2.2 Theoretical frame work for students' academic achievement

2.3 Assessment in science education

Kinds of assessment in Science education

- The nature of assessment
- Formal versus informal assessment
- Formative versus summative assessment
- Continuous versus terminal assessment
- Course work versus examination assessment
- Process versus product assessment
- Criterion-referenced versus norm-referenced tests
- Internal versus external examination achievements

2.4 Relationship between internal and external examination achievements

2.5 Review of related studies

2.6 Summary

2.2 THEORITICAL FRAME WORK FOR STUDENTS' ACADEMIC ACHIEVEMENT :

A unique theory of Achievement motivation has been developed by David C. McClelland (1961). Working on earlier research that indicated people in general have a need for achievement (Murray, 1938), Mc Clelland found some individuals have a significantly higher need to achieve than others do. Need for achievement refers to the person's inclination to strive to overcome obstacles. Mc Clelland identified three distinct needs that are important for various types of individuals: need for achievement; need for power, and need for affiliation. The most important is the need for achievement.

According to him, the need for achievement can be learned. If an individual has a higher need to achieve, it is important for such an individual to believe that his or her efforts will result in successful performance, and even more, that successful performance will bring reward (achievement).

Most classroom tests are achievement tests. They described what a person has learned to do. The success or failure of any educational innovation depends on the effect it has on student's achievement; therefore, Examination is geared towards maximizing student's achievement. The two basic faults of examinations as a measure of students' academic performance are first, generally examinations do not give objective results and secondly, they become invariably and unfortunately, an end in themselves rather than one of the means to an end. For example, admission examinations are final examinations. This implies that the admission examination into secondary schools comes at the end of the primary education. Research has

shown that the grading that result from examination has little correspondence to final carrier of most people in life. For example, McClelland (1973) study shows how little grades and Intelligent Quotient (IQ) correlate to or predict vocational success. Also school examination according to Piaget (1970) becomes an end in itself because "it dominates the teachers concern, instead of fostering his natural role as one who stimulates conscience and minds and directs all of the work of the students toward the "examination result" in final tests, instead of calling attention to the students real activities and personality". For Piaget, standardized examinations are educationally harmful because of the reverberating effect they have on educational practice. While he is not opposed to assessment in principle, the development assessment while he upholds is objective (in the sense that there is little room left for chance in the determination of the child" response) and assesses operative and connotative learning as well as figurative attainments. In Piaget's view, developmental assessment is a continual process that records the actual work children do during the specified stages of life. He further postulates that a collection of a child's work, a folder containing some of his/her writing (in mathematics, science, arts and craft and so on) is much more meaningful than grades. Keeping such records and making decisions about what sample of work are contained in it, Piaget maintains, is a valuable learning experience in itself. The same cannot be said for taking tests or examinations. In short, Piaget advocates "documentation" rather than "examination" which he says is consistent with the educational philosophy of the active classroom. Examination, of course, is not the "alpha and omega of education". But on the other hand, life without examination is

a life that can hardly be lived (Mcintosh, 1949). In a real sense, examination assessments that were meant as appendages of education, have superceded education itself in pre-eminence, just as technology supersede science. Thus, assessment of students' performance using examination is not congruent with the desired goals in science education.

Cognitive and developmental psychologists all agree that new methods of learning should exploit every effort to present the subject matter to be taught in form assimilable to candidates of different ages in accordance with their mental abilities and their various stages of development. The curriculums should contain some specifications as to what skills, concepts and facts children are to acquire, at what time and in what order.

2.3 ASSESSMENT IN SCIENCE EDUCATION

In science education, as well as other branches of education, different kinds of assessment methods and techniques are in existence. In Nigeria, the main assessment procedures currently in use in secondary schools aim mainly at measuring students' achievement or performance in the cognitive and psychomotor domains. In essence, they measure diverse intellectual capabilities and skills such as recall of knowledge, understanding and comprehension, the ability to apply knowledge to solve problems, analysis, synthesis and manipulative skills (Bloom, 1956).

In the discussions that follow the author has attempted to describe some elements of assessment. These are: -

a. The nature of assessment.

b. Kinds of assessment procedures.

Assessment can generally be described as an act of measuring. In majority of instances, for example, in achievement testing, the measurement often yields fairly quantitative information about students' knowledge of the subject matter or practical skills as the case may be (Kempa, 1986). In other instances, the information may be less quantitative and more qualitative, as when judging pupil's attitude towards a subject studied or a particular activity. But, here too, an act of measuring is involved.

Before the introduction of a National Policy on Education, assessment in Nigerian Secondary Schools was done exclusively in the cognitive domain. But now, the National Policy demands that assessment should be made in the cognitive, affective, and psychomotor domains (NPE, 1981).

In defining assessment in the context of what is obtains in the senior secondary schools in Nigeria, it is important to clarify some terms that are often used interchangeably by teachers: testing, measurement and evaluation. These terms do not mean exactly the same thing. A test is an instrument of device used for finding out the presence of absence of a particular phenomenon being tested. And when a test is administered, the procedure involved in doing so is called testing. Measurement is the quantitative numerical description of the results obtained from testing. Evaluation is the qualitative judgement often made about a person or thing. Such judgement is based on testing and measurement, and sometimes it is arrived at through the use of non-testing devices like rating scale, questionnaire, anecdotal records, checklist and inventories. For instance, if a particular student is the best in Physics in the class, this

value judgment devices form the series of test results in Physics in which the particular student consistently scored better than his classmates. And sometimes it can come from the teacher's experience of the class as well.

There are different kinds of assessments that are carried out in the secondary schools. Some of these are as follows:

Formal versus Informal Assessment: Formal assessment according to Rowntree (1977) is the type of assessment conducted in situations which have been set solely for it, usually using well validated tests or other instruments. In the secondary schools, it may be in the form of mid-term examinations, end of term and end of year examinations. It can also be in the form a major part of the terminal work. While informal assessment is carried out without prior notice or arrangement. It may take the form an unannounced tests, class/practical work that is marked and recorded, short oral or written quiz and the likes. The scores obtained are also added up to the terminal continuous assessment scores.

Formative Versus Summative Assessments: The basic distinction between formative and summative assessment of a child's learning is that formative provides or day-to-day assessment student" performance in terms or helpful written or oral comments on students work (Satterly 1986). This helps to motivate the student whereas the overall assessment of a child's learning or performance is summative when information is not made available for feedback purposes. Satterly (1986), maintained that formative assessment is carried out principally by and for those responsible for the development of the programme or course of study, while summative is preferably

carried out by some one not personally involved in its development. But the results of summative assessment may well have implications for future formative work.

The internal assessment currently carried out in sciences can be regarded as formative assessment because it takes into account four basic characteristics. First, systematic that is (requiring an operational plan namely: the measurements to be made, at what time or period; the taking and filing of records and the determination of assessment instrument used). Secondly, it is cumulative in that any determination made at any point in time about any student takes account of previous decisions already made about him. Thirdly, it is comprehensive, covering all aspects of human endeavors by manipulating various assessment tools. And fourthly, it is guidance-oriented that is; the information obtained serves as a basis from which to guide further growth and development of students.

In effects, internal (continuous) assessment does not aim at judging but at providing the student with the maximum opportunities to learn and demonstrate from time to time the knowledge, the skills and attitudes that they have acquired during the teaching and learning process.

On the other hand, the external (S.S.C.E.) assessment is summative, taking account of the overall assessment of students' performances. This kind of assessment is expected to play a key role in evaluation of a programme of study. Its major purpose is to identify some deficiency areas in programme of study, and to suggest possibly, any need for improvement or a change of the programme. A large percentage of the populace misuse and misinterpret such kind of assessment results. They use such results to classify a school or students of that particular institution as " dull or lazy",

and "poor", if the results is not favorable, and 'bright, good' etc if the result is favorable. The matter does not end there. The whole blame or praise is apportioned to the teachers - the implementers of the programmes. To a specialist in educational assessment or evaluation, an unfavorable result is sometimes an indication of a child's learning need diagnostic, and calls for a remedial strategy to help the child. But where assessment results/data stop at classification of candidates as 'dull', lazy' and 'poor' such acts are of little value unless they are followed by an intelligent attempt to modify or adapt the programme to the educational needs of the candidates. This is the reason why Jencks et al (1973) lamented that schools serve primarily to legitimize inequality and not to create it.

Continuous versus terminal assessment: Continuous assessment was introduced partly because complaints that it was unfair and unnecessarily to learners to be examined only on a single occasion or over a short period of time where the bulk of the questions play a particularly significant part in their chances for success (Miller, 1976). Thus, the continuous assessment has advantages to the learners because:

- Assessment is continuous as part of mastery in learning,
- It encourages steady application throughout course,
- It does not unduly penalize the learner for one or two pieces of work, and
- It encourages the development of a variety of problems solving skills.

Rowntree (1977) however points out possible disadvantage here. These are that: Only work, which is to be assessed, receives the attention of the learner, but at least in terminal examination, you do not know what is going to come up. It is difficult to establish what is and what is not the learner's own personal contribution. Tutors often

find themselves spending considerable amount of time investigating plagiarism. Anxious students experience only slight less stress and this over a mush longer period of time than with the terminal assessment. All assessment levels are potential capable of raising level of anxiety.

Course work versus examination: Course work could incorporate the results of tests and even examinations. Likewise final assessment could consist of a summation of course work grade.

Examination grades tend to enjoy greater respectability in the eyes of the public than course work grades. The latter can too easily contaminated by favoritism and cheating. Course work grades can be achieved in a variety of conditions, including assignments, projects, tests etc. Course work grades however render the principles of comparability in operative, as individual schools have varieties of ways for assessment. Marks of examiners too often differ quite widely in some subjects, especially in the sciences when taking into account the educational domains.

Process versus product assessment: Process assessment is based on the assumption that the students have learned for courses/course components and the skills and competence they have acquired. Process assessment-the main function of this assessment is to assess the students' progress in a course of study or to monitor work input or learning difficulties. This is normally in-course assessment and are conducted whilst a course is still in progress. Consequently, the results of this type of assessment cannot be taken to represent a student's terminal skills and abilities.

Criterion-referenced versus norm-referenced tests: The most serious problem of assessment measures is that of criterion selection. Criterion selection has to

do with what will be accepted as the outcome of a course of instruction (Teibo, 1983). Most classroom tests are achievement tests.

Achievement tests can either a criteria-referenced or norm-referenced test. A Criterion-referenced test is concerned primarily with the individuals' ability to perform tasks which are representative of some explicit criterion (Teibo, 1983). It is an attempt to interpret the results in terms of clearly defined learning outcomes, which serves as the criteria for forming judgements. It permits us to describe an individual's performance without reference to the performance of others who have taken the test. It is not interested in whether the subject has or has not mastered the criterion behavior or whether his standard are better or worse than those of others in the same group or class.

On the other hand, a norm-referenced test is used to ascertain individuals' performance in relations to the performance of other individuals on the same measuring device. The individual is compared with some normative group. The group is called a norm because its performance serves as the norm for forming judgements. (Satterly, 1986).

When a school or teacher reports a child's progress or receives an external assessment of a student's performance in the cognitive domain (as in the case of internal or external examination results) a norm-referenced approach is adopted. In many schools, grades (which may be numerical or literal) are reported and these are often accompanied by labels or short verbal descriptions. These labels or descriptions assess the student's performance in relation to the group to which he/she belongs. For instance, a grade 'A' may be described as outstanding, 'C' as average 'E' pass and so on. Thus the 'norm' is the group and the assessment refers to it.

In summary, continuous assessment calls for a shift from a 'norm-referenced' to 'criterion-referenced' mode of assessment (Teibo, 1983). And because of its characteristic nature of being systematic, comprehensive, cumulative and guidance-oriented, it requires variety of assessment strategies to deal with all domains of learning. As Bajah (1984) commented, "continuous assessment involves a continuous updating of judgments about performance in relations to specific criteria which will allow, at any time, a cumulative judgement to be made about performance upon these same criteria". It is then the best method of finding out what the student has gained from learning activities in term of knowledge, thinking and reasoning, character development and industry.

Internal versus external examination: This kind of assessment is found currently in use in the Nigeria secondary educational system. The internal assessment is decentralized and administered on the basis of individual schools. The papers are internally set and marked by teachers within the school and/or departments. The WASC examinations are centralized and papers are entirely externally set and marked. This imposed some sort of external "check" on the secondary school examination system, which is conducted internally by the teachers.

In favour of internal assessment is the argument that the teacher knows the students' better than an outsider. Moreover, they are the operators and implementers of the educational programmes. On one hand, the big argument in favour of external assessment according to Rowntree (1977) is that it forces a comparison of local and national standards and provides a check on the complacency which may result if

teachers remain ignorant of levels of achievement by similar students elsewhere, while on the other hand, floundering teachers may be checked by this method of assessment.

External assessment can take two forms. Satterly (1986) opines that "in the strong sense it applies to the assessment of students achievement in tests externally set and externally examined. In the weak sense it points to the possibility of teachers accepting the tests set or published externally but marking them internally in accordance with the tests' specification" (Satterly, 1986).

Examination as a means of assessing achievement of students in schools was introduces with the intention of promoting uniformity in curricular/classroom instructions rather than for assessing or identifying individual differences. The high premium school authorities and Government place on examination as the only way of assessing a child's progress at school has fostered many social ills in the school system among which are wide spread examination malpractice (cheating and leakage) immorality, unfaithfulness. Furthermore, even social unrest and unnecessary emphasis placed on paper qualification rather than professionalism is obvious manifestations of this malaise. (Daily Times July, 22nd 1987; New Nigeria, October 2nd, 1989: 21.1.1; National concord, August 7th 1987:16; The Nigerian standard, Tuesday, January 18th, 1994:7.5 and Friday, February 11th, 1994). It can therefore be pointed out conveniently here that "our schools are geared more toward examinations rather than professional competence".

It is generally recognized that teachers hold the key position in schools and that the success or failure of teaching and education depend mainly on them. Based on this fact, the National |Policy on Education (NPE, 1981 revised) provides that "the

assessment of students progress should be based on continuous assessment, either in part or in whole", and that, "Certification of the senior secondary school will be based on continuous assessment and a formal examination". If the assessors actually take into account a child's performance over a long period of time and in a variety of situations, it should be possible to obtain a more representative view of his or her capabilities more than in the artificial context of the examination room. And if well implemented, the continuous assessment "encourages steady application throughout the course, and does not unduly penalize learners for one or two pieces or work and encourages more closely the development of a variety of problem solving skills which are inhibited by the need to develop examination "tricks" (Satterly, 1986).

Criticizing the system of examination, David (1973) declared that "it is seriously fearful that the goals of life long education will not be accomplished unless the examination system, prevalent in many countries of the world, are reformed". It is felt that the present attitude of students, teachers, parents and the general public towards examination, and the current system of grading and classification are likely to constitute impediments to the drive for scientific and technological development.

2.4 RELATIONSHIP BETWEEN INTERNAL AND EXAMINATION ACHIEVEMENT

Normally, one would expect that internal examination achievement could be used to predict success in external examinations. This is more so since the major purpose of schooling is to prepare one for life-to be able to handle issues of life and solve simple problems. But research has shown that in many areas of human endeavor,

results from tests in internal examinations emphasizing knowledge and understanding are not highly positively correlated with actual performance in external examinations (Geberich, 1974). According to Kempa (1987) psychological findings have shown that there are many factors affecting or influencing learning and performances in examinations. These include special abilities, temperament, industriousness, parental encouragement and support, quality of teaching, general intelligence, interest, and regular attendance at lesson. These factors can be categorized into intrinsic and extrinsic factors.

To be able to predict if a relationship exists between internal and external examination achievements, "the validity and reliability of the two tests" must be examined (Satterly 1986). And for internal examination achievement to be used to predict success in external examination, there must be a common theoretical framework used by both bodies for the assessment. The internal and external tests need to use similar criteria for assessment. (Adesegun, 1982).

2.5 REVIEW OF RELATED STUDIES

In this section, review is made of related studies. It also highlights some previous work done in this area to show their relevance to the present study. The few relevant research work available to this researcher concentrated primarily on the correlation between internal and external examination achievements. Okorho (1980) carried out investigation to determine the extent to which internal examination achievement could bee used to predict success in external examination. Taking a sample of one hundred and seventeen students of the school of Basic studies (SBS), Ahmadu Bello University, Zaria and Advanced Teachers College (now Federal College

of Education), Zaria, he correlated the students sets of internal and external examination scores with their academic achievement in the universities. A positive but low correlation coefficient of 0.31 and 0.24 were obtained respectively. When put to the Spearman's Ranked Order Correlation test, they were both found to predict future academic achievement at 0.05 level of significance. The internal examination achievement would positively predict success in external examinations.

Majasan and Bakare (1974) studied the predictive validity of the three entry qualifications into the University of Ibadan General Certificate of Education (Advanced Level), as well as the preliminary year examination for those who were admitted with G.C.E. ordinary level. They used a stratified random sample of one thousand (1000) students form six (6) faculties out of two thousand, one hundred and forty seven (2,147) students admitted into the university between 1962 and 1969. They found that the entry qualifications accounted for between nine percent and twenty-five percent of the variance in the degree examination performance. They therefore, concluded that the entry qualifications "are useless as meaningful predictors of degree performance".

Also Ming (1975) reported a study by Elgio (1971) on the predictive validity of the Junior Secondary School Leaving Certificate (JSSLE) taken in the Republic of Zambia at the end of three years secondary school. Using the score in some subjects in the 1969 Cambridge Overseas Certificate (COSC) taken after two year of senior secondary course as criterion, Ming found that there was a correlation of 0.44 between JSSLE English and COSC English, and a correlation of 0.66 between JSSLE and

COSC Mathematics. He found the JSSLE Certificate to be very poor predictor of COSC Mathematics performance.

Using a sample of one hundred and four Nigerian students in the United States. Ohuche (1974), found that previous educational experience as measured by the grade in School Certificate Examination of Nigerian undergraduates studying in institutions of higher learning in the United States could not be used to predict satisfactorily the academic achievement of such students as measured by the cumulative grade point average (CGPA). He found that the CGPA at the end of the first year was a better predictor of the students' eventual academic performance.

A similar study was conducted by Baget (1987) to determine the relationship between internal and external examination in special mathematics at school of Preliminary Studies Keffi, in Nasarawa State. The sample was made up of 84 students. When the scores of internal and external examinations were correlated, Baget found that there was a strong positive relationship between the students' performance in internal and external examinations. The study is similar to the present study where internal examination in form of continuous assessment achievement is being used to predict performance in the external examination. Also Dominic (1987) established a positive correlation between students' performance in Chemistry at mock GCE and G.C.E. 'O' level examination results. In his investigation he found that the correlation between the results of students in mock-GCE in 1983, was 0.76 at 0.05 level of significance. And for 1985 and 1986, the correlation were 0.72 and 0.75 respectively. He then concluded that there is a high positive relationship between mock-GCE level performance with G.C.E. examination. Likewise Okunlola (1980) while comparing

similar mock-WASC examination in Biology found a correlation of 0.75 which is significant. To him, the reason for this significant relationship was based on the observation that: the conduct of the two examinations was similar,

i. The standard of the two examinations were similar, and

ii. The methods of setting the examination were also similar.

Some of the studies so far reviewed have reported a high positive correlation, while others revealed low and weak but positive correlation between the internal and external examination scores. For example, a very low positive correlation was reported in the studies carried out by Okorho (1980), Ohuche (1974) and Majasan and Bakare (1974). However, a high positive correlation was reported in the studies carried out by Dominic (1987) and Okunlola (1970). The contradictions reported in these findings justify the need for further investigation into the relationship between internal and external examination achievement.

2.6 SUMMARY

In this section, highlight of some recent studies carried out on the relationship between internal and external examinations are examined. The relationship and relevance of the previous studies to the present research were also considered. The findings of the previous research reported in this study shows a positive correlation between internal and external examination scores. But while some reported a low positive correlation between internal and external examination scores, other show a moderate and high positive correlation. In all the studies examined, there is no where that a zero or no correlation was reported between internal and external examination scores.

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Although, there has been an observed disparity in the results of these tow examinations, however, scores of an internal examination can be used as a valid predictor of external examination achievement. But for the internal examinations scores to be used as a predictor of external examination achievement, there should be close criteria of questioning or marking system.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methods and procedures used to collect data in the study. Other aspects also considered in the chapter include the description of the study population, sampling technique and procedure for data analysis.

3.2 THE POPULATION OF THE STUDY

For the purpose of school administration, supervision and management, Borno State is divided into four educational zones (Biu, Gwoza, Maiduguri Metropolis, and Monguno zones). There are eighty (80) Senior Secondary Schools registered for the Senior School Certificate Examinations (SSCE) in Borno State. Some of them are designated as Arts, Arts and Science, Technical/vocational and special Science schools are the focus of this study. There are at least two of such schools in each of the four educational zones. The science schools are regarded as special because they are well equipped with science facilities and qualified teachers. The chronological ages of the students range from fifteen to nineteen years with the average age of about seventeen years.

3.3 SAMPLING PROCEDURE

A total of 480 results of students were selected for this study, 160 from Government College Maiduguri, 160 from Government Girls' Senior Secondary School Konduga and 160 from Government Science Secondary School Uba. These results collected were from internal examination and the external results' grade.

The determination of the sample size is based on Krejcie and Morgan (1970) and Roscoe (1975) scales for determining sample size for behavioral science research activities. Roscoe (1975) observed that in studies involving behavioral sciences, sample size of between 30 and 500 is generally a reasonable choice.

The candidates with complete records of internal and external examination assessments were randomly selected for the study, and their scores in the tow assessments were compiled for statistical computation.

3.4 PROCEDURES FOR COLLECTING DATA

The data for this study were collected from two principal sources which were: the students' academic records for the senior secondary schools and the final SSCE results. This was done for the SS3 students for 1992/93; 1993/94; 1994/95 AND 1995/96 academic year consecutively .

The data from the students academic records gave information about their academic performance in the internal (Continuous Assessment) examinations taken throughout the three years of senior secondary schools. All the students considered in this study have taken an average of eight end-of-term continuous assessment examinations and have been taught for a minimum of twenty-seven months with three-hundred and twenty effective teaching weeks. In each of these weeks, the students were taught for a minimum of two minutes period in theory (classroom) and one 80 minutes period for practical laboratory work in each of t he basic science subjects.

The diary and weekly record of works that contains these information is obtained from the Vice Principals (Academic) office. The students academic performance were gathered from the "terminal continuous assessment sheet" (from CA Cognitive domain) and from Annual assessment summary (from CA as, part a Cognitive domain, see appendix) is obtained from the examination and record office. These information were collected from the selected schools for SS1, SS2, and SS3 for the years under study (i.e. 1993 - 1996). The termly continuous Assessment sheets incorporate forty percent (40%) of all the tests, assignments and projects carried out during the term, and sixty percent (60%) of terminal examination. This is done for each terms in SS1, SS2 and SS3.

The students' academic achievement in the Senior Secondary School Certificate were obtained from the respective schools in respect of each student in the sample. These were collated along with the data obtained respectively for their continuos assessment scores and then subjected to necessary analysis.

3.5 TREATMENT OF DATA

The grading of scores in the internal examination and SSCE is relatively t he same. However, while the internal examination results are reported in other raw scores and lettered grades the SSCE results are reported in letter grades only.

The internal examination scores that were used in this study were subjected to the procedures shown in, table 3.1 and 3.2 below. It gives overview of

how the overall average internal assessment scores of each student is obtained over the 3 schooling years of SS1, 2 and 3, in each and all the schools.

TABLE 3.1 A

SS1

Candidate	SS 1		
	TERM 1 RESULT	TERM 2 RESULT	TERM RESUI
001	48	56	71
002	43	45	77
003	58	45	56
004	51	48	65
005	19	53	44

TABLE 3.2 FINAL CONTINUOUS ASSESSMENT SCORE FOR INTERNAL EXAMINATION

CANDIDATE	SS1 AV. SCORE	SS2 AV. SCORE	SS3 AV. SCORE	TOTAL	FINAL AV.
001	58.33	32.33	48.67	139.33	46.55
002	55.00	40.67	62.33	158.00	52.66
003	53.00	57.67	43.00	133.67	44.56
004	54.67	41.67	41.33	137.32	45.77
005	38.66	48.33	48.33	137.67	45.89

Table 3.1 and 3.2 above show the sample of termly results for SS1, SS2 and SS3 that are sent to WAEC as C.A score.

A brief description of the contents of the tables (3.1 and 3.2) is as follows:

i. The average of the terminal examination for SS1, SS2 and SS3 were computed. This gave information about the average score for each year of study (see table 3.1, 3.2 above).

ii. Then the average of the averages for SS1, SS2 and SS3 were also computed. This gave the final score for each student in each subject for internal examination.

iii. The final average score for each student becomes his/her raw score for internal examination. And it is these that are used for the purpose of this study by way

of correlating them, write the respective achievement of the students in the SSCE examinations.

The results were reported in lettered graded for which a range of score was specified. And since the raw scores were not given, the midpoint of the range of scores for each performance category were calculated and taken as the required raw scores for each student (Table 3.3 below).

Table 3.3 Grading Profile Generally Used by WAEC

SCORE	MID POINTS	GRADE	REMARK
75+	87	A1	Excellent
70-74	72	A2	Very good
65-69	67	A3	Good
60-64	62	C4	Credit (upper)
55-59	57	C5	Credit
50-54	52	C6	Credit (lower)
45-49	47	P7	Pass
40-44	42	P8	Pass
Below 40	20	F9	Fail

Source: The West African Examination Council:

Test and Measurement Division

3.6 Statistical procedures for analyzing data

For the purpose of statistical analysis, the final internal examination scores were represent by letter X and the external examination scores were represented by letter Y.

These letters represent in this study the independent and the dependent variables respectively.

There are a variety of methods that can be used for the purpose of computing correlation coefficient of given data. A lot depends on the nature and the scale of the date. In this study, the Pearson product Moment correlation coefficient, was used as it was considered most appropriate. This is statistics for measuring the degree of linear relationship between two variables, X and Y, and hence give an estimate of the correlation between the two scores. The formula for calculating r is as follow:

$$r = \frac{\sum XY}{\sqrt{\sum X^2 \sum Y^2}}$$

If the value of r is close to +1, X and Y are very strong positively correlated. If it is close to -1, then X and Y is very strong negatively correlated. If r is close to zero, then the correlation between X and Y is very low, and if r = 0, then there is not correlation between X and Y at all. Fowler and Cohen (1990) give a range of the value of coefficient of r for determining the strength of correlation (Table 3.4 below).

Table 3.4 Value of r for determining the strength of correlation

Value of coefficient	Strength of correlation
0.00-0.19	A very weak correlation
0.20-0.39	A weak correlation
0.40--.69	A moderate correlation
0.70-0.89	A strong correlation
0.90-0.1.00	A very strong correlation

Table 3.4 Shows the range of coefficient of r for determining the strength of correlation by Fowler and Cohen (1990).

Regression analysis which was also used as a statistical took in this analysis is concerned with the problem of actually predicting one variable from another. The variable that is predicted is known as the *dependent* (i.e external examination scores) variable, and the variable that is used to predict the dependent variable is known as the independent variable (in this case, is the internal examination scores). In this analysis, the author attempted, through the use of regression analysis to predict likely students' performances in SSCE examinations for the knowledge of their performance in internal examination, i.e. their assessment scores.

3.7 SUMMARY:

This study was designed to determine whether the students' academic achievement in internal examination could be used to predict their success in the external

examination. The study data were collected from the students' past academic records in internal examinations along with their performances in the examination (SSCE).

The Pearson Product Moment Correlation Coefficient statistics was considered most appropriate and thus used for analyzing the data to test the stated hypotheses.

CHAPTER FOUR

ANALYSIS OF DATA, RESULTS AND DISCUSSION

4.1 INTRODUCTION

In this chapter, the analysis of data, results obtained and the discussion of the results is presented. The four hypotheses formulated for testing as stated in chapter one of this study are:

a. There is no significant relationship between the students' scores in Biology in the internal and external examinations.

b. There is no significant relationship between internal examination scores of the students in Chemistry and their scores in the same subject in the external examinations.

c. There is no significant relationship between the students' scores in the internal and external examinations.

d. The students' academic achievement in internal examination cannot be used as valid predictor of their achievement in external examinations.

The first part of the analysis deal with Pearson Product Moment Correlation of the students' scores in the internal examination with their scores in the external examination, that is, hypotheses i - iii above. This was done for the science subjects Biology, Chemistry and Physics for the years 1993, 1994, 1995 and 1996.

The second part of the analysis dealt with multiple regression analysis aimed at determining whether the students' scores in the internal examination can be used to predict their performance in the external examination. A discussion of results was given, and the chapter closed with a brief summary of the main highness.

4.2 PRESENTATION OF RESULTS

Below are the results of correlation between internal and external examination scores.

Table 4.01 Correlation Between Students Performances in Internal Examination and SSCE Results for Biology for School A

Year of Study	N	Variables	X	Std. Dev.	r	r^2	Remark
1993	92	X	51.54	12.45	0.67	0.45	A moderate correlation
	92	Y	48.99	17.87			
1994	94	X	60.77	16.22	0.66	0.44	A moderate correlation
	94	Y	45.87	15.62			
1995	102	X	59.98	16.93	0.72	0.52	A strong correlation
	102	Y	47.23	17.23			
1996	107	X	46.01	25.01	0.84	0.71	A strong correlation
	107	Y	42.81	15.32			

KEY: X = Continuous Assessment (CA) Scores in Biology.
Y = Senior School Certificate Examination (SSCE) Scores in Biology.

Table 4.01 above shows the results of correlation between CA and SSCE for school A. The results show a moderate in 1993 and 1994 and a strong correlation for 1995 and 1996.

Table 4.02 **Correlation Between Students Performances in Internal Examination and SSCE Results for Biology for School B**

Year of Study	N	Variables	X	Std. Dev.	r	r2	Remark
1993	92 92	X Y	58.18 41.15	5.43 13.67	0.45	0.20	A moderate correlation
1994	94 94	X Y	58.37 33.46	9.57 11.93	0.76	0.57	A strong correlation
1995	102 102	X Y	58.28 39.17	7.39 10.41	0.28	0.08	A weak correlation
1996	107 107	X Y	23.51 20.58	12.69 11.19	0.70	0.49	A strong correlation

From table 4.02 above, it could be shown that there is a weak correlation results between internal examinati9n scores and SSCE results in school B in the year 1995 and a moderate correlation in 1993, and strong correlation in 1994 and 1996.

Table 4.03 Correlation Between Students Performances in Internal Examination and SSCE Results for Biology for School C

Year of Study	**N**	***Variables***	**X**	***Std. Dev.***	***r***	***r2***	***Remark***
1993	92	X	52.35	14.35	0.69	0.47	A moderate correlation
	92	Y	41.94	16.39			
1994	94	X	55.49	17.08	0.74	0.54	A strong correlation
	94	Y	35.64	16.71			
1995	102	X	52.41	19.19	0.80	0.64	A strong correlation
	102	Y	35.74	18.14			
1996	107	X	36.99	21.94	0.84	0.70	A strong correlation
	107	Y	29.65	18.76			

Table 4.03 above shows the correlation for Biology for school C. It shows a moderate correlation between internal examination scores and SSCE results for 1993 and a strong correlation for 1994 to 1996.

Table 4.04 Correlation Between Student Internal Examination and SSCE for Chemistry: School A

Year of Study	N	Variables	$\bar{X}$	Std. Dev.	r	r2	Remark
1993	92	X	57.26	14.38	0.74	0.55	A strong correlation
	92	Y	41.39	17.21			
1994	94	X	54.41	14.98	0.88	0.68	A strong correlation
	94	Y	49.64	19.58			
1995	102	X	47.18	16.84	0.77	0.60	A strong correlation
	102	Y	42.64	18.62			
1996	107	X	45.85	11.58	0.76	0.58	A strong correlation
	107	Y	42.77	12.96			

Table 4.04 above shows the correlation results for Chemistry for school A. It could be observed that the chemistry results for the years under study shows a strong correlation between internal examination scores and SSCE scores.

Table 4.05 Correlation Between Student Internal Examination and SSCE for Chemistry: School B

Year of Study	N	Variables	X	Std. Dev.	r	r2	Remark
1993	92 92	X Y	52.35 41.94	14.34 16.39	0.69	0.47	A moderate correlation
1994	94 94	X Y	55.49 35.64	17.08 16.71	0.74	0.54	A strong correlation
1995	102 102	X Y	52.41 35.74	19.19 18.14	0.80	0.64	A strong correlation
1996	107 107	X Y	36.99 29.65.	21.94 18.76	0.84	0.70	A strong correlation

Table 4.05 above shows the correlation for Chemistry results for the year under study. A moderate correlation in 1993 and a strong correlation between internal examination scores and SSCE for 1994 to 1996.

Table 4.06 Correlation Between Student Internal Examination and SSCE for Chemistry: School C

Year of Study	N	Variables	$\bar{X}$	Std. Dev.	r	r2	Remark
1993	92 92	X Y	52.88 35.17	17.37 15.14	0.59	0.34	A moderate correlation
1994	94 94	X Y	52.81 35.85	16.27 19.37	0.62	0.38	A moderate correlation
1995	102 102	X Y	40.38 31.84	15.33 18.43	0.77	0.59	A strong correlation
1996	107 107	X Y	43.72 32.41	12.17 17.12	0.73	0.53	A strong correlation

Table 4.06 above presents the internal examination scores and SSCE results. It shows a moderate correlation in 1993 and 1994 and strongly correlation in 1995 and 1996.

Table 4.07 **Correlation Between Internal Examination and Scores and SSCE for Physics for School A**

Year of Study	N	Variables	$\bar{X}$	Std. Dev.	r	r2	Remark
1993	92	X	58.15	14.30	0.68	0.47	A moderate correlation
	92	Y	46.76	16.18			
1994	94	X	61.58	20.39	0.86	0.74	A strong correlation
	94	Y	42.87	15.74			
1995	102	X	52.21	23.53	0.89	0.79	A strong correlation
	102	Y	39.58	18.58			
1996	107	X	51.74	22.70	0.75	0.57	A strong correlation
	107	Y	34.82	14.78			

From the results shown in Table 4.07 above, there is a strong correlation from 1994-1996 and a moderate correlation in 1993 between internal examination scores and SSCE results for Physics in School A.

Table 4.08 **Correlation Between Internal Examination and Scores and SSCE for Physics for School B**

Year of Study	N	Variables	X	Std. Dev.	r	r2	Remark
1993	92 92	X Y	54.37 27.66	15.66 8.26	0.05	0.00	A very weak correlation
1994	94 94	X Y	52.88 27.28	8.26 8.72	0.15	0.02	A weak correlation
1995	102 102	X Y	40.24 29.06	15.32 8.44	0.72	0.60	A strong correlation
1996	107 107	X Y	40.42 27.07	12.11 8.94	0.53	0.28	A moderate correlation

The results of Physics for School B in Table 4.08 above show a very weak correlation in 1993 and 1994 and strong correlation in 1995, and moderate in 1996.

Table 4.09 **Correlation Between Internal Examination and Scores and SSCE for Physics for School C.**

Year of Study	N	Variables	X	Std. Dev.	r	r2	Remark
1993	92 92	X Y	50.88 35.12.	16.82 14.93	0.57	0.33	A moderate correlation
1994	94 94	X Y	51.00 30.35	18.98 15.81	0.78	0.60	A strong correlation
1995	102 102	X Y	42..49 29.06	20.30 8.44	0.79	0.62	A strong correlation
1996	107 107	X Y	44.37 26.49	17.97 14.14	0.71	0.50	A strong correlation

From the Table 4.09 above, it could be observed that there is a moderate correlation in 1993 and strong correlation in 1994 to 1996, between internal examination scores and SSCE results in Physics for school C.

Table 4.10 **A summary of the correlation categories**

Strength of correlation	**Frequency**	**Percentage**
A very weak correlation	01	2/78
A weak correlation	02	5.56
A moderate correlation	01	27.78
A strong correlation	23	63.88
A very strong correlation	00	0.00

Table 4.10 above shows a summary of the strength of correlation in frequency distribution and percentage. Looking at the analysis of the strength of correlation, it can be said that there is a strong correlation between the internal examination scores and achievements in SSCE in the Science Secondary Schools studied.

There are four hypotheses formulated for testing as stated in chapter one of this study and re-stated at the beginning of this chapter. The first three hypotheses are formulated to test the relationship between internal examination scores and achievements in SSCE for Biology, Chemistry and Physics, while the fourth hypotheses was formulated to find out if the independent variable (internal examination achievement) can be used to predict the independent variable, that is achievement in external examinations.

BIOLOGY

(a) **4.3.1 Test for relationship between internal examination scores with SSCE results for Biology.**

The null hypothesis tested here is

Hoi: There is no significant relationship between the students' scores in the internal examination and their scores in external examinations in Biology in Borno State

Hoi: PXY = 0

Where PXY is the correlation coefficient between the students' score in the internal examination and their achievements in SSCE for Biology.

The raw scores for the internal and external examinations in Biology were used to test the hypothesis. Judging for the correlation coefficient results for Biology in Schools A, B, and C in Tables 4.1; 4.2 and 4.3, the value of r obtained for school A was +0.67; + 0.72 and + 0.84 for the year 1993, 1994, 1995 and 1996 respectively.

While the results of 1993 and 1994 show moderate correlation, the results of 1995 and 1996 are strongly correlation.

In School B, the value of r for Biology was + 0.45; + 0.76; + 0.28 and + 0.70 for 1993, 1994, 1995 and 1996 respectively. The results showed a weak correlation for 1995, a moderate correlation in 199 and a strong correlation for 1994 and 1996. Similarly, in School C, the value of correlation coefficient for was +0.69; + 0.74; + 0.80 and +0.84 for the same year of study. The results showed a moderate correlation in 1993 and strong correlation in 1994, 1995 and 1996. Looking at the summary of the correlation results for Biology in the three schools as shown in table 4.11 below, there

is generally strong correlation between the internal examination scores and SSCE achievements in Biology in Borno State.

Table 4.11 Summary of the correlation for Biology

Schools/Results	Very Weak	Weak	Moderate	Strong	Very Strong
School A	0	0	2	2	0
School B	0	1	1	2	0
School C	0	0	1	3	0
Total	0	1	4	7	0

Table 4.11 summary of correlation results for Biology in the three Science Schools for four years of study – 1993, 1994, 1995 and 1996.

All the r-values are positive and significant for Biology at $P<0.05$ level. (Table 4.12).

From the table above, it can be seen that there is a significant positive correlation between the students' scores in the internal examination and their scores in SSCE in Biology for the four years under i.e. 1993, 1994, 1995 and 1996. This implies that students who perform well in the internal examination are expected to have also performed well in the external examination, and vice versa. So the hypothesis was rejected.

CHEMISTRY

(b) **Relationship between internal examination scores and SSCE for Chemistry.**

The null hypothesis tested here is:

Ho_2: There is no significant relationship between the students' scores in the internal examination in Chemistry in Borno State.

Tables 4.4; 4.5 and 4.6 above show the correlation results for Chemistry in Schools A, B, and C. The values of r obtained for school A were +0.74; +0.82; +0.77 and +0.76 for 1993, 1994, 1995 and 1996 respectively. All the values of r for Chemistry in school A show strong correlation. In school B, the values of r were +0.69; +0.80 and +0.84 for 1993, 1994 1995 and 1996 respectively. These show a moderately strong correlation in 1993 and strong correlation in 1994, 1995 and 1996. While in school C, the values of r, were +0.59; +0.62; +0.77 and +0.73 for the same years of study respectively.

The results also show a moderately strong correlation in 1993 and 1996. Just as in Biology, the results of correlation coefficients between internal and external

Table 4.12 **Test of significance for r-values of Biology in Schools A, B, and C.**

Year	N	Df	r(cal)	r(crit)	Decision	Remarks
SCHOOL A BIOLOGY						
1993	92	91	0.67	0.17	0.67>0.17	Significant
1994	94	93	0.66	0.17	0.66>0.17	Significant
1995	102	101	0.72	0.16	0.72>0.16	Significant
1996	107	106	0.84	0.16	0.84>0.16	Significant
SCHOOL B BIOLOGY						
1993	92	91	0.45	0.17	0.45>0.17	Significant
1994	94	93	0.76	0.17	0.76>0.17	Significant
1995	102	101	0.28	0.16	0.28>0.16	Significant
1996	107	106	0.70	0.16	0.70>0.16	Significant
SCHOOL C BIOLOGY						
1993	92	91	0.69	0.17	0.69>0.17	Significant
1994	94	93	0.74	0.17	0.74>0.17	Significant
1995	102	101	0.80	0.16	0.80>0.16	Significant
1996	102	106	0.84	0.16	0.84>0.16	Significant

Source: Biometrica Tables for statistics 1. (Third edition)

Table 4.12 shows results of the test significance of correlation for Biology for Schools A, B, and C.

examination scores in Chemistry are generally strong positive correlation (see Table 4.14 below, summary of correlation results for Chemistry).

Table 4.13 Summary of the correlation results for chemistry

Frequency of the relative strength of r					
Schools/Results	**Very weak**	**Weak**	**Moderate**	**Strong**	**Very strong**
School A	0	0	0	4	0
School B	0	0	1	3	0
School C	0	0	2	2	0
Total	0	0	3	9	0

Total 4.13 summary of correlation results for Chemistry in three schools for four years of study (1993-1996).

The summary of the correlation results presented in table 4.13 above give an indication that there is generally strong positive correlation between the internal and external examination scores. This lead to the rejection of the null hypothesis of no significant relationship between internal and external examination scores in Chemistry and that there is a strong positive correlation between the two scores (in internal and external examinations). When put to significant test, they are also found to be statistically significant at $P<0.05$ level as shown in Table 4.14 below.

Table 4.14 Test of significance for Chemistry in Schools A, B, and C.

SCHOOL A CHEMISTRY

Year	N	Df	r(cal)	r(crit)	Decision	Remarks
1993	92	91	0.74	0.17	0.74>0.17	Significant
1994	94	93	0.82	0.17	0.82>0.17	Significant
1995	102	101	0.72	0.16	0.72>0.16	Significant
1996	107	106	0.76	0.16	0.76>0.16	Significant
SCHOOL B CHEMISTRY						
1993	92	91	0.69	0.17	0.69>0.17	Significant
1994	94	93	0.74	0.17	0.74>0.17	Significant
1995	102	101	0.80	0.16	0.80>0.16	Significant
1996	107	106	0.81	0.16	0.81>0.16	Significant
SCHOOL C CHEMISTRY						
1993	92	91	0.50	0.17	0.50>0.17	Significant
1994	94	93	0.62	0.17	0.62>0.17	Significant
1995	102	101	0.77	0.16	0.77>0.16	Significant
1996	107	106	0.73	0.16	0.73>0.16	Significant

Table 4.14 shows results of the test of significance of correlation for Chemistry for Schools A, B, and C.

PHYSICS

(c) **Test for relationship between internal examination scores with SSCE scores for Physics**

The null hypothesis tested here is:

Ho_3: There is no significant relationship between the students' scores in the internal examination with their scores in Physics in Borno State.

The computation from the raw scores of the internal and external examinations for Physics for Schools A, B and C were used to test the hypothesis. Tables 4.7; 4.8 and 4.9 show the correlation coefficient between the two variables for Physics. The obtained value of r for Physics in Schools A was +0.68; +0.80; +0.89 and +0.75 for the year 1993, 1994, 1995 and 1996 respectively. The results show a moderately strong correlation for 1993 and strong correlation for 1994, 1995 and 1996. Similarly in School B, the value of r was +0.05; +0.15; +0.72 and +0.53 for the same years respectively. The results obtained show a very weak correlation in 1993, a weak correlation in 1994, and strong correlation in 1995 and a moderately strong correlation in 1996. The results of School C where the values of r obtained were +0.57; +0.78; +0.79 and +0.71 for the same year of study respectively. The results show moderate correlation in 1993 only, while the rest of the years of study show a strong correlation. A summary of the result is presented in table 4.15 below.

Table 4.15 Summary of the correlation results for Physics

School/Results	Very Weak	Weak	Moderate	Strong	Very Strong
School A	0	0	1	1	0
School B	0	0	1	1	0
School C	0	0	1	3	0
Total	0	1	3	7	0

Table 4.15 summary of correlation results for Physics in three schools for four years of study (1993-1996).

Just as in school A Biology and Chemistry above, the null hypothesis for Physics is rejected, because there is a strong positive correlation between the scores of internal and external examinations. This can also be implied that the students who did well in their internal examinations, and those who did poorly in the internal examinations also did the same in the examinations When the results of Physics was put to significant test, schools A and C results were found to be statistically significant at $P<0.05$ level, while in school B, the results were not significant in 1993 and 1994 because if the poor performance in both the internal and external examinations (see table 4.10 below) but show a significant result for 1995 and 1996.

Table 4.16 Test of significance for Physics in Schools A, B, and C

SCHOOL A PHYSICS

Year	N	Df	r(cal)	r(crit)	Decision	Remark
1993	92	91	0.68	0.17	0.68>0.17	Significant
1994	94	93	0.86	0.17	0.86>0.17	Significant
1995	102	101	0.89	0.16	0.89>0.16	Significant
1996	103	106	0.75	0.16	0.75>0.16	Significant
SCHOOL B PHYSICS						
1993	92	91	0.05	0.17	0.05<0.17	Not significant
1994	94	93	0.15	0.17	0.15<0.17	Not significant
1995	102	101	0.72	0.16	0.72>0.16	Significant
1996	103	106	0.53	0.16	0.53>0.16	Significant
SCHOOL C PHYSICS						
1993	92	91	0.57	0.17	0.57>0.17	Significant
1994	94	93	0.78	0.17	0.78>0.17	Significant
1995	102	101	0.79	0.16	0.79>0.16	Significant
1996	103	106	0.71	0.16	0.71>0.16	Significant

Table 4.16 presents the results of the test of significance of correlation for Physics for Schools A, B, and C.

A summary of the correlation results (results (Table 4.16) shows that 63.88% of all the scores in science subjects offered in the three science schools under study in Borno State were strongly correlated. It implies that all the null hypotheses i-iii rejected are from these results. This applies in all the three subjects.

(d) **Regression Analysis for prediction of SSCE achievement from internal examination scores.**

The hypothesis tested here is:

The internal examination scores cannot be used as valid predictor of achievements in the external examination in Science subjects in Borno State.

The raw scores for combined internal and external examinations were employed to obtain the multiple regression equation for Biology, Chemistry and Physic. The regression equation that was used for predicting the data was $Y = a + bx$. The regression equation by computer analysis for each of the science subjects were obtained as follows:

Biology	**Y**	=	9.15 + 0.77**X**
Chemistry	**Y**	=	6.07 + 0.45**X**
Physics	**Y**	=	5.57 + 0.30**X**

The use of the regression equation is to predict likely scores in SSCE for Biology, Chemistry and Physics. The Y in the equation above represents likely SSCE scores that would be predicted. For instance, the value of 9.15 in Biology represents

"a" in the equation given above. The "a" is constant, which means, it is the point at which the regression line intercepts the y-axis, while the coefficient 0.77, also represent "b" in the equation above. This is the "slope or the gradient" of the line of best fit. The "b" therefore, stands as a ratio. It tells how many units Y increase for every increase in one unit of X. as "b" value therefore increases the corresponding Y value also increases. The detail procedure for the use of the regression equation as it concerns this study is explained under the discussion of the results that follows below.

DISCUSSION OF THE RESULTS AND FINDINGS FROM THE STUDY

The results of the study generally revealed that there is a strong positive correlation between the internal and external examination scores in Biology, Chemistry and Physics (Table 4.11, 4.13 and 4.15 for summary of the results). The finding of this study corroborate the views expressed by various authors cited in chapter 2 of the study. They include Adejemi (1987), Baget (1987) and Dominic (1987) who in their different studies on a similar subject found that there is a string positive relationship between internal examination (CA) scores with achievement in external examination (SSCE) or degree examination as in the case of Adejemi (1987). Some of the authors also reported in their studies that there is a very high correlation between the two examinations. These finding have also been confirmed by this study, given the strong positive correlation between the two variables.

The finding for this study contrasted the views expressed by Majasan and Bakare (1974) and Okorho (1980) that reported in their separate studies a very low positive correlation between internal and external examination scores. But in this study,

only Physics results for school B in 1993 and 1994 showed a very weak positive correlation.

Another way of explaining the result of this study is to look at the mean scores of two examinations. The mean scores in the internal examinations tend to be higher than the mean scores in the external examinations as obtained in tables 4.1 – 9. For instance, in school A Biology (Table 4.1), the mean scores in the internal examination are 51.64; 60.77; 59.98 and 46.77 for the year 1993, 1994, 1995 and 1996 respectively. These indicate that at least, many students in the school have passed their examination as judge by the high mean score. Comparing the internal examination mean scores to that of the external examination (which is 48.99; 45.87; 17.23 and 42.81) over the same years of study in school A, it is observed that the mean scores of the students in the internal is higher than that of the external examinations. By computing the average mean scores of CA=53.90 and SSCE = 34.72, it is observed that the fact still remain the same.

standard deviation values. For example, in school B and Chemistry, the standard deviation for internal examination (CA) for 1993 is 14.34 and SSCE is 16.39. The standard deviation in SSCE is higher than CA. This means, in the normal distribution, the SSCE scores deviate far away form the mean than the internal examination scores. This can be explained by examining the scores using the normal distribution: The range from one standard deviation above the mean (+1) to one standard deviation below the mean (-1) in a normal distribution is 68.27% of the cases. If the standard deviation of CA = 14.34 in Chemistry and the mean score is 52.35, then the distance from +1 to –1

on the scale of measurement is 52.35 plus or minus 14.34, that is, 66.69 or 38.01 respectively. This is obtained by adding 52.35 + 14.34 = 66.69; or 52.35 – 14.34 = 38.01. Similarly, comparing the CA and SSCE to determine the variability, the mean score is 14.94 and the standard deviation is 16.39. By applying the same method of calculation with CA above, 41.94 + 16.39 = 58.33; or 41.94 – 16.39 = 25.55. The variability then can be determined by subtracting 38.01 from 66.69 of CA, which are 28.68; and 25.55 form 58.33 of SSCE, which are 37.78. The degree of dissension between CA 28.68 and SSCE 32.78 is obtained by subtracting the former from the latter, which gives a difference of 4.1.

Another way of examining the results of this study is to interpret the value of r terms of r^2, which is the coefficient of determination. When multiplied by hundred, the r^2 gives the percentage of the variance in Y that is accounted for by X in the study. For example, when r is 0.68 (as in the case of Physics in school A, 1993), the percentage of the variance in Y that is accounted for by X is 46.24%.

The research question " can performance in internal examination be used as valid predictors of performance in external examination amongst science secondary school students in Borno State?" can largely be answered in the affirmative form of these results. That is to say that, the scores in the internal examination can be used as valid predictors of achievement in SSCE in science subjects. The multiple regression analysis gave the relation equations shown earlier (page 68). The indication that they gave is that the internal examination cores can be used as valid predictors of internal examination achievement. The regression equation obtained for Chemistry is Y = 6.07 + 0.45X; Biology is Y = 9.15 + 0.77X and Physics is Y = 5.55 = 0.39X. Thus, to

predict Y based on CA scores for any of the three science subjects is to simply substitute X with the CA scores and then compute for the predicted SSCE scores. For instance, a student who scored 58% in internal examination in Chemistry can be predicted to obtain about 36.67 score in SSCE, which is a failure. This is obtained by substituting the value of X in the equation, that is, $Y = 6.07 + 0.45$ multiplied by 58 is 36.67. This means, unless a student obtains as high as 76% in internal examination. He/she cannot pass the SSCE examination in Biology. So, only A (distinction) students are likely to pass the SSCE Biology examinations. This may be due to the fact that the internal examination scores arises from many hands (different categories of teachers) in contrast with the SSCE scores that are fairly homogeneous marking scheme all over the country. It might also be explained that the internal examination scores couldn't be exonerated from charge of favoritism, cheating, victimization and spurious approximation of scores, which is difficult to be refuted. This may further constitute weakness and hence wide variability in the internal examination scores. But if properly handled, the internal examination removes examination fear, fever and failure, since the students carry it out in relaxed manner.

The test for significance was carried out for the 36 pairs of CA and SSCE scores using the degree of freedom as N-2 (Tables 4.12; 4.14 and 4.16). The calculated value of r was found to be greater than the critical value at P 0.05. The calculated r differs significantly from the critical value except in Physics of School B for 1993 and 1994 where no significance was found. This means that the probability that no significant relationship exist between variables X and Y is 5% or less.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

The purpose of this study was to determine;

a. The relationship between internal and external examination results, and

b. Whether internal examination scores could be used to predict achievements in the external examination in science subjects in Borno State.

To achieve this purpose, four hypotheses were formulated for testing.

These were:

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i. There is no significant relationship between the students' scores in the internal examination (C.A.) and those of the external examination SSCE in Borno State.

ii. The internal examination scores are valid predictors of external examination achievement in science subjects in Borno State.

iii. There is no significant relationship between the students' scores in the external examination in physics and their scores in external examination in Borno state.

iv. The internal examination scores do not constitute a valid predictor of achievements in external examination in Science subjects in Borno State.

A Total of 480 students randomly selected from each of the three Science Schools were used. The sample size was based on krejcie and Morgan (1970) and Roscoe (1975) scales for determining sample size for behavioral Science research activities.

Data were collected from the past records of student's assessment in the internal examination, and SSCE results. The Pearson product Moment Correlation Coefficient

was used to test the relationship between the students' scores internal examination with their achievements in external examination (SSCE) along side the test of significance by obtaining the relevant values.

The findings of the study were as follows:

1. There was a strong positive correlation between the students' internal examination scores and their achievement in external examination (SSCE) in the three basic Science Subjects in Borno State.
2. The findings of the study showed that if a student performed well in the external examination (SSCE).
3. The multiple regression analysis showed that the internal examination scores are valid predictors of achievements in the external examination.
4. But there exist a wide variability between the internal examination scores and the SSCE results as judged by their mean scores and standard deviations both within the Schools and between one School and another.

5.2 CONCLUSION :

From the findings of this study, it is concluded that there is fairly positive and moderately high correlation between internal examination scores and achievement in external examination in secondary schools in Borno state.

5.3 RECOMMENDATION:

Based on the findings from this, the following recommendations are made:

1. The Federal Government assertion which state that "educational assessment and evaluation will be liberalized by basing them in whole or in part on Continuous Assessment of the progress if individual" (NPE 1981 revised) tends to have been

supported by this study. This was shown by fact that the continuous assessment correlates with the SSCE results. Science teachers in the secondary schools, given better incentives can be more thorough and systematic in handling their teaching, marking and grading of the Continuos Assessment materials so as to enhance homogeneity in the internal examination scores and bridge the wide variability in cores between schools. And if properly handled, the internal examination scores can cater for the requirement of admission and employment, even if as interim measure i.e. on provisional basis.

2. Workshops and Seminars should be organized regularly, and teachers encourage to attend such fora in order to improve their skill in techniques of continuos assessment in school science.

5.4 LIMITATION OF THE STUDY

1. The findings and conclusions of this study are limited only to the variable-internal and external examination scores for measuring scores for measuring relationship and prediction of likely measurement in one variable from a known measurement in the other. There are many other factors, such as environmental condition, psychological factors, mental ability etc that could be used to predict future academic performances, which for practical purposes do not form past of the design of this study.

2. One other limitation of the study is the non-availability of WAEC/SSCE raw scores. This might have contributed to make the results otherwise less robust. The mid points of the range of scores in the SSCE aggregate was used as an estimate to obtain the actual raw score, in this circumstance error may be incurred.

3. The four years used, as period of study is relatively short. Given more financial resources it would have been better to use longer period of years, for instance, 8 - 10 years.

5.5 SUGGESTION FOR FURTHER STUDIES

The findings for this study have some problems for further research, which include the wide variability in standard deviation between internal and external examination scores.

A similarly study should be carried out in other subjects areas to find out if this variability could be bridged up.

REFERENCES

Abe, D.E. (1989). The relationship between continuous assessment and examination grades in P.H.E. Department, Ahmadu Bello University, Zaria. Unpublished M.Ed thesis.

Adesegun, J.O. (1982) . Prediction of performance on the WASC commerce examination in Kaduna State. Unpublished M.Ed. thesis, Ahmadu Bello University, Zaria.

Adenlewa, J.O. (1980). The effects of Pre-entry qualification on students' academic performance. Unpublished M.Ed. thesis, A.B.U. Zaria.

Adeyemi, J.A. (1989). The relationship between continuous assessment and examination scores of B. Ed. Social Studies and Science Education students in Department of Education, Ahmadu Bello University, Zaria. Unpublished M.Ed. thesis.

Ajayi, D. (1987). The school Administrator's perception of students' poor performance in Public examination. In A. Dada, mass failure in public examination. In: Proceedings of the National Conference of mass failure in public examination, University of Ibadan, Ibadan.

Ajayalemi, D. (1990ED). Science and Technology in Africa: Focus on seven sub-Saharan countries. University of Lagos, Lagos.

Akinwumiju, J.A. (1979) Evaluation and the Mathematics Teachers. Lecture delivered at the conference of the Mathematics Association of Nigeria held at Oyemekun Grammar School, Akure.

Akinwumiju, J.A. and Orimoloye, P.S. (1987). Accountability in Public Examination: The Nigerian Situation. In: Preceedings of the National Conference on mass failure in Public examination, 21st-25th April. The Editor.

Akpan, A.A. (1988). The relationship between Math's problem-solving and effective behaviour among secondary school students. Nigerian Educational Forum. 11 (2) Dec. pp. 227-233.

Anderson, C.M. (1977). Psychological Testing. New York, Macmillan Pub. coy. Inc, pp. 750-761.

Ashby, S.E. (1959). An historical Analysis of the Development of Higher Education in Nigeria. Commissions report, part II.

Ata, S.A. (1973). A study of MOCK-WASC examination results as a predictor of performance in WASC examination in selected school in Igala – land from 1967-1972. P.GDE thesis, Ahmadu Bello University, Zaria.

Ayorinde D. (1987ED). Mass failure in Public Examination: Causes and Problems. In: Proceedings of the National Conference of mass failure in public examinations, Faculty of Education, University of Ibadan, Press, and Ibadan.

Baget, B.D. (1987). An Evaluation of students' performance in the internal and external examination in special Mathematics in SPS Keffi. M.Ed thesis, Ahmadu Bello University, Zaria.

Bajah, S.T.(1984). The national Policy on Education and Continuous Assessment in WASC Chemistry; implications for Curriculum Development in Nigeria. A paper presented at the STAN Chemistry panel workshop in Jos.

Bajah S.T. (1984). Continuous assessment and Practical work in Science Teaching: A plea for pragmatism. Journal of Science Teachers' Association of Nigeria. 22(2).

Banjo O. (1960). A review of Educational system in Western Nigeria. *Commission report, (part two). Ibadan, Government Printer pp. 1, 1.4.*

Bloom, B.S. (1956). The taxonomy of Educational Objectives: Handbook 1, *Cognitive Domain.* New York, Mckay Inc.

(1987) The falling Standard of Education. September 14; 15.

Davole, N.C. (1987). A correlation study of students' performance in Mathematics and two science (Chemistry and Geography) in MOCK and WASC 1981-1986. PGDE thesis, Institute of Education, Ahmadu Bello University, Zaria.

Dominic, B. (1987). A correlation study of students performance in chemistry at MOCK GCE and GCE 'O' level, 1982-1985 in Kwara State. PGDE thesis, Institute of Education, Ahmadu Bello University, Zaria.

Eze, E. C. (1981). Entrance examination as predictor of students' performance in Nigeria higher Educational Institution. Journal of Science Teachers' Association of Nigeria. 20(1) 32-41.

Ezewu, E.E. (1983). Sociology of Education. Harlow, Essex, Longman Publishing Company, Lagos.

Ezewu, E.E. (1981). Principle and practical of Continuous Assessment. Ibadan, Evans Brothers (Nigeria Publishers) Ltd.

Fafunwa, A.B. (1985). The new Educational Policy and the strategy for its implementation. A keynote address presented at the National seminar workshop on the problems and implications of 6-3-3-4 policy of Nigerian Education.

Federal Ministry of Education (1981). National policy on Education, Revised. Federal Government Press, Lagos.

Federal Ministry of Education (1985). A handbook on Continuous Assessment. Federal Government Press, Lagos.

Fowler, J. and Colewl (1990). Practical Statistics for field Biology. MacDonald and Evans Ltd. Great Britain.

Gerberich, J.R. et al (1974). Measurement and Evaluation of modern schools. New York's, David Mckay Coy Ltd. New York.

Handdel, J.D. (1978). Introductory Statistics for Sociology. New Jersey. Prentice-Hall Inc., PP 170-180, 237-239.

Ipaye, T. (1982). Continuous assessment in Schools (with some counseling application). Ilorin University Press Ilorin.

Jencks, C. et al (1973). Inequality in reassessment of the effects of family and schooling in America. London; Allen Lane.

Kempa, R. (1986). Assessment in Science. Cambridge, University Press.

Krejcie, R.V. and Morgan, D.W. (1970). Determining sample size for research activity: Educational and Psychological Measurement 30 (608).

Magaji, J. (1994). A Predictive Study of MOCK-WASC Economics Examinations at Federal Government Girls' college Potiskum. Unpublished M. Ed thesis, Ahmadu Bello University, Zaria.

Majasan, J.A. and Bakare, G.M. (1974). The predictive Validity of Ibadan University entry qualification. African Journal of Educational Research. 1(1) 61-71.

McClelland, D.C. (1966). The measurement of human motivation: An experience approach. In A. Anastasia (Ed) Testing Problems in Perspective. Washington D.C.; American Council on Education.

Mcintosh, H.G. (1984). A teachers' Guide to Assessment. Sheltnham; Stanley Thorns (Publishers) Ltd.

Miller, P.E. (1976). A comparison of the ability of Secondary Teachers and Students of Biology to understanding Science. Proceedings of the Iowa academy of science, 70 510-513.

Ming, P. (1975). The predictive validity of the JSSLC examination, Republic of Zambia. In E.C. Eze, Entrance Examination as a predictors of students performance in a Nigeria higher educational institution. Journal of Science Teachers Association of Nigeria. 20(1). 32-41.

Montgomery, R (1978). A new examination of examinations. London, Routledge and Kegan Paul.

Gyallesu, A.B. (1989). The 6-3-3-4 Educational system: The journey so far New Nigeria Newspaper. Sept., 16:5

Obilade S.O. (1986). Changing value system as a factor in the poor performance of students in public examination. In Proceedings on National Conference on Mass failure in public examinations, 21st - 25th April.

Ohuche, R.O. (1974). Academic Achievement of Nigerian Undergraduates as a factor of previous Educational experience. West Africa Journal of Education. (2): 111-115.

Okorho, E.A. (1980). Comparative study of internal and external examination as predictors of future academic achievement. Unpublished M.Ed. Thesis, Ahmadu Bello University, Zaria.

Okunlola, G.A. (1980). The correlation between performances at Mock-WASC and WASC in Biology at the Nigerian Military School, Zaria, PGDE, Institute of Education, Ahmadu Bello University, Zaria.

Onyemah, I.J. (1976). Performance of Ujoma Grammar School, Asaba in MOCK and WASC examinations (1970-1975). PGDE, Institute of Education, Ahmadu Bello University, Zaria.

Osha, A.R.A. (1974). The effects of the dual entry qualifications and introductory course on the student's course at Kaduna Polytechnic. Unpublished PGDE thesis, Ahmadu Bello University, Zaria.

Piaget, J. And Inhelder, B. (1970). Memory and Intelligence. London, Routlidge & Kegan Paul.

Piaget, J. (1970) Science Education and the Psychology of child. New York, Onon.

Roscoe, J.T. (1975) Fundamental Research Statistic for behavioural Science International series in decision processes, 2nd Edition.

Rowntree, D. (1977). Assessing Students: How shall we know them. London, Harper and Row.

Satterly, D. (1987). Assessment in Schools: Theory and practice in Education. Oxford, Brasil Blackwell Ltd.

Shayer and Adey, P. (1981). Towards a Science of Science teaching in Nigeria. Heinemann Educational Books Ltd.

Taiwo, C. (1985). Nigeria Education. Ogbonoje Press Ltd. Ibadan.

Teibo, B.O. (1983). An investigation of the instructional problems encountered by beginning secondary school science Teachers. Journal of Science Teachers Association of Nigeria. Vol.20(1): 50-65.

Turton, P.(1988). *Continuous Assessment in J.S.S.: A case study of the inter-correlation between C.A. and attainment tests scores in Integrated Science and Raven's Progressive matrices.* Unpublished M.Ed. thesis., Ahmadu Bello University, Zaria.

Ukwanyi, A.O. (1976). Effects of entry qualifications and students academic achievement in the executives grade final examination at Kaduna Polytechnic. Unpublished PGDE thesis, Ahmadu Bello University, Zaria.

Washima, M.D.(1976). The relationship between entry qualifications, schools achievement and job performance quality of the Northern States Agricultural Assistants. Unpublished M.Ed. thesis, Ahmadu Bello University, Zaria.

V3	92	57.2609	14.3771
V4	92	41.3913	17.2116

Correlations: V4

V3 .7133**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

- 475958

This procedure was completed at 12:49:07

correlation variables =v5 with v6/statistics 1,2.

Variable	Cases	Mean	Std Dev
V5	92	58.1522	14.2951
V6	92	46.7609	16.1765

Variables		Cases	Cross-Prod Dev	Variance-Covar
V5	V6	92	11389.3478	158.1247

Correlations: V6

V5 .0507

N of cases: 91 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:25
correlation variables = v7 with v8/statistics 1,2.

Variable	Cases	Mean	Std Dev
V7	90	58.3667	9.5723
V8	90	33.1556	11.9739

Variables		Cases	Cross-Prod Dev	Variance-Covar
V7	V8	90	7722.9667	86.7749

Correlations: V8

V7 .7571**

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:26
correlation variables =v9 with v10/statistics1,2.

Variables		Cases	Cross-Prod Dev	Variance-Covar
V9	V10	90	3789.3333	42.5768

Correlations: V10

V9 .3139**

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:26
correlation variables =v11 with v12/statistics 1,2.

Variable	Cases	Mean	Std Dev
V11	90	52.8778	8.3556
V12	90	27.2778	8.7191

Variables		Cases	Cross-Prod Dev	Variance-Covar
V11	V12	90	950.0556	10.6718

```
DATA LIST FILE 'C:\DOS\file2.dat' /v1 to v24 1-48.
correlation variables= v1 with v2/statistics 1,2.
The raw data or transformation pass is proceeding
    117 cases are written to the uncompressed active file.
```

Variable	Cases	Mean	Std Dev
V1	94	58.1809	5.4259
V2	94	11.1189	13.6704

Variables		Cases	Cross-Prod Dev	Variance-Covar
V1	V2	94	3079.4681	33.1126

Correlations: V2

V1 .1164**

N of cases: 94 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

```
This procedure was completed at 10:17:23
correlation variables =v3 with v4/statistics 1,2.
```

Variable	Cases	Mean	Std Dev
V3	94	58.2660	13.2008
V4	94	29.6915	10.8112

Correlations: V4

V3 .1715

N of cases: 94 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

```
This procedure was completed at 10:17:24
correlation variables =v5 with v6/statistics 1,2.
```

Variable	Cases	Mean	Std Dev
V5	94	54.3723	15.6583
V6	94	27.6596	8.2587

Variables		Cases	Cross-Prod Dev	Variance-Covar
V5	V6	94	609.9149	6.5582

Correlations: V6

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 12 SPSS/PC+ 9/25/9

This procedure was completed at 12:19:09

correlation variables = v7 with v8/statistics 1,2.

Page 13 SPSS/PC+ 9/25/9

Variable	Cases	Mean	Std Dev
V7	92	60.7717	16.2204
V8	92	15.8696	15.6185

Page 14 SPSS/PC+ 9/25/9

Variables		Cases	Cross-Prod Dev	Variance-Covar
V7	V8	92	15291.2609	168.0358

Page 15 SPSS/PC+ 9/25/

Correlations: V8

V7	.6633**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 16 SPSS/PC+ 9/25/

This procedure was completed at 12:19:11

$\bar{x}$ 14.9322 ~

54.4130 19.5755 .8248

49.6413

Page 17 SPSS/PC+ 9/

Variables		Cases	Cross-Prod Dev	Variance-Covar
V9	V10	92	21940.6304	241.1058

Page 18 SPSS/PC+ 9/

Correlations: V10

V9 .8218**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 19 SPSS/PC+ 9/

This procedure was completed at 12:49:12

correlation variables =v11 with v12/statistics 1,2.

Page 20 SPSS/PC+ 9/

Variable	Cases	Mean	Std Dev
V11	92	61.5761	20.3892
V12	92	12.8696	15.7447

Page 21 SPSS/PC+ 9/

Variables		Cases	Cross-Prod Dev	Variance-Covar
V11	V12	92	25193.9130	276.8562

Page 22 SPSS/PC+ 9/

Correlations: V12

V11 .8624**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 12:49:14

correlation variables = v13 with v14/statistics 1,2.

Variable	Cases	Mean	Std Dev
V13	92	59.9783	16.9252
V14	92	46.4457	17.2291

Variables	Cases	Cross-Prod Dev	Variance-Covar
V13 V14	92	19202.8913	211.0208

Correlations: V14

V13 .7237**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 12:49:16

correlation variables =v15 with v16/statistics 1,2.

Page 28 SPSS/PC+ 9/25/

Variable	Cases	Mean	Std Dev
V15	92	47.1848	16.8418
V16	92	12.6113	18.6191

Page 29 SPSS/PC+ 9/25/

Variables		Cases	Cross-Prod Dev	Variance-Covar
V15	V16	92	22075.0978	242.5835

Page 30 SPSS/PC+ 9/25/

Correlations: V16

V15 .7736**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 31 SPSS/PC+ 9/25/

This procedure was completed at 12:19:17

correlation variables =v17 with v18/statistics 1,2.

Page 32 SPSS/PC+ 9/25/

Variable	Cases	Mean	Std Dev

V18 92 39.5761 18.5841

Variables Cases Cross-Prod Dev Variance-Covar

V17 V18 92 35302.0543 387.9347

Correlations: V18

V17 .8875**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 12:19:18

correlation variables =v18 with v19/statistics 1,2.

Variable Cases Mean Std Dev

V19 92 46.9674 25.0083 .8440

V20 92 12.8152 20.3237

Variables Cases Cross-Prod Dev Variance-Covar

39038.4457 428.9939

V18 V19 92 23511.7283 258.3706

V23 92 51.7391 22.6967

V24 92 34.8152 14.7811

Variables Cases Cross-Prod Dev Variance-Covar

V23 V24 92 22965.5652 252.3688

Correlations: V24

V23 .7523**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 12:19:21

---

finish

Correlations: V19

V18 .5559**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 12:19:19

correlation variables = v20 with v21/statistics 1,2.

Variable	Cases	Mean	Std Dev	r
V20	92	15.8478	10.5815	.7608
V21	92	12.7717	12.9667	

Variables		Cases	Cross-Prod Dev	Variance-Covar
V20	V21	92	10391.8043 8740.4130	114.1957 96.0485

Correlations: V21

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V20 .4081**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

B

```
DATA LIST FILE 'C:\DOS\file1.dat' /v1 to v24 1-48.
correlation variables= v1 with v2/statistics 1,2.
The raw data or transformation pass is proceeding
    117 cases are written to the uncompressed active file.
```

Page 2 SPSS/PC+ 9/25/

Variable	Cases	Mean	Std Dev
V1	92	51.6413	12.4526
V2	92	18.9891	17.8679

Page 3 SPSS/PC+ 9/25/

Variables		Cases	Cross-Prod Dev	Variance-Covar
V1	V2	92	13598.6413	149.4356

Page 4 SPSS/PC+ 9/25/9

Correlations: V2

V1 .6716**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 5 SPSS/PC+ 9/25/9

This procedure was completed at 12:19:06

```
correlation variables =v3 with v1/statistics 1,2.
```

Page 6 SPSS/PC+ 9/25/9

Variable Cases Mean

Correlations: V12

V11 .1165

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:28
correlation variables = v13 with v14/statistics 1,2.

Variable	Cases	Mean	Std Dev
V13	90	58.2778	7.3882
V14	90	39.1667	10.4109

Variables		Cases	Cross-Prod Dev	Variance-Covar
V13	V14	90	1939.8333	21.7959

Correlations: V14

V13 .2831*

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:29
correlation variables =v15 with v16/statistics 1,2.

Variable	Cases	Mean	Std Dev
V15	90	39.1667	10.7277
V16	90	30.8222	13.0596

Variables		Cases	Cross-Prod Dev	Variance-Covar
V15	V16	90	11182.1667	125.6457

Correlations: V16

V15 .8968**

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:31
correlation variables =v17 with v18/statistics 1,2.

V17	90	40.2444	15.3156
V18	90	29.0556	8.4420

Variables		Cases	Cross-Prod Dev	Variance-Covar
V17	V18	90	8323.7778	93.5256

Correlations: V18

V17 .7234**

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:32
correlation variables =v18 with v19/statistics 1,2.

Variable	Cases	Mean	Std Dev
V19	90	29.0556	8.4420
V20	90	23.5111	12.6901

Variables		Cases	Cross-Prod Dev	Variance-Covar
V18	V19	90	917.4444	10.3084

Correlations: V19

V18 .0962

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

This procedure was completed at 10:17:34
correlation variables = v20 with v21/statistics 1,2.

Variable	Cases	Mean	Std Dev
V21	90	20.5889	11.1948
V22	90	13.8778	11.3344

Variables		Cases	Cross-Prod Dev	Variance-Covar
V20	V21	90	276.1778	3.1065

Correlations: V21

V20 .0215

Page 43 SPSS/PC+ 9/25

This procedure was completed at 12:49:20

corelation variables =v22 with v23/statistics 1,2.

Page 44 SPSS/PC+ 9/25

Variable	Cases	Mean	Std Dev
V22	92	42.7717	12.9607
V23	92	31.7391	22.6967

Page 45 SPSS/PC+ 9/25

Variables		Cases	Cross-Prod Dev	Variance-Covar
V22	V23	92	17877.5217	196.4563

Page 46 SPSS/PC+ 9/25

Correlations: V23

V22 .6678**

N of cases: 92 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 47 SPSS/PC+ 9/25

This procedure was completed at 12:49:20

correlation variables =v23 with v24/statistics 1,2.

Page 48 SPSS/PC+ 9/25

KASHIM IBRAHIM LIBRA

Variable	Cases	Mean	Std Dev

" . " is printed if a coefficient cannot be computed

Page 43 SPSS/PC+ 9/26/97

This procedure was completed at 10:17:35
corelation variables =v22 with v23/statistics 1,2.

Page 44 SPSS/PC+ 9/26/97

Variable	Cases	Mean	Std Dev
V23	90	28.3778	10.8136
V24	90	40.1222	12.1137

Page 45 SPSS/PC+ 9/26/97

Variables		Cases	Cross-Prod Dev	Variance-Covar
V22	V23	90	-397.3556	-4.1647

Page 46 SPSS/PC+ 9/26/97

Correlations: V23

V22	-.0341

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 47 SPSS/PC+ 9/26/97

This procedure was completed at 10:17:36
correlation variables =v23 with v24/statistics 1,2.

Page 48 SPSS/PC+ 9/26/97

Variable	Cases	Mean	Std Dev
V23	90	40.1222	12.1137
V24	90	27.0667	8.9403

Page 49 SPSS/PC+ 9/26/97

Variables		Cases	Cross-Prod Dev	Variance-Covar
V23	V24	90	5082.1667	57.1064

Page 50 SPSS/PC+ 9/26/97

Correlations: V24

V23	.5273**

N of cases: 90 1-tailed Signif: * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

Page 51 SPSS/PC+ 9/26/97

This procedure was completed at 10:17:38

Page 52 SPSS/PC+ 9/26/97

finish

:HOOL STATE SENIOR SECONDARY YEAR

ANNUAL ASSESSMENT SUMMARY

part a COGNITIVE DOMAIN

Grades awarded according to rank order in Year Group A: top 10%, B: next 20%, C: next 40%, D: next 20%, E: last 10%.

	CORE SUBJECTS NOTE • The ACTUAL subject to be taken should be written in after the colon. (see footnotes)	FIRST TERM				SECOND TERM				THIRD TERM				EXTERNAL ASSESSMT			OVERALL RESULT				
		Score out of	Position	Grade	Entered by	Score out of	Position	Grade	Entered by	Score out of	Position	Grade	Entered by		Score	Grade	Score out of	Position	Grade	Entered by	Transferred to cumulative record CA3
1	English Language :													1							
2	Nigerian Language :													2							
3	Mathematics													3							
4	Science Subject * :													4							
5	Arts Subject ** :													5							
6	Vocational Subject *** :													6							
B	ELECTIVES (see footnotes)																				
1														1							
2														2							
3														3							
4														4							

A. CORE SUBJECTS.
- *The Science Subject should be chosen from one of the following - Physics, Chemistry & Biology.
- **The Arts Subject should be chosen from one of the following - Literature in English, History & Geography.
- ***The Vocational Subject should be chosen from Agricultural Science or any other Vocational Subject.

B. ELECTIVES. These are the optional subjects chosen to give a suitable combination with the Core Subjects for future studies. Normally only THREE electives are chosen, one of which may be dropped in the final year. Observe any WAEC Regulations which may prohibit certain subject combinations.

47598

ame	Class	Adm. No.	House	Sex

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ss

SCHOOL

STATE

SENIOR SECONDARY
YEAR

Rating Scale, 5 - excellent 4 - good 3 - fair 4 - poor 1 - very poor

PERSONAL & SOCIAL QUALITIES

	1st Term Rating	Entered by	2nd Term Rating	Entered by	3rd Term Rating	Entered by	Annual Rating	Entered by
Punctuality								
Attendance at class								
Carrying out assignments								
Participation in class								
Neatness in appearance								
Politeness								
Honesty								
Initiative								
Relationship with others								
Self control								
Helping others								
Sense of responsibility								
Emotional stability								
Physical health								

ATTITUDES (From Attitudes Inventory)

Attitude to study								
" teachers								
" schoolmates								
" school property								
" school programmes								

III. INTERESTS : Literary Scientific, Musical, Social Service etc. (Complete Vocational Interest Inventory once each Year in the Third Term

	MAJOR INTERESTS
1st	2nd
3rd	4th
Signed	Date

IV. CO-CURRICULAR ACTIVITIES : Literary & Scientific e.g. Debating, Library Drama, Music, Painting, Science Hobby Cultural activities, Dance, Creative writing, Recitation.

	Activity (State which and give rating)	Initials
1st Term		
2nd Term		
3rd Term		

V. OUTDOOR ACTIVITIES : Games, Sport, Gymnastics, Red Cross, Scouts, Guides, Swimming, Boys & Girls Brigades

	Activity (State which and give rating)	Initials
1st Term		
2nd Term		
3rd Term		

VI. POSITIONS HELD IN SCHOOL ORGANISATIONS

	Position held (State which and give rating)	Initials
1st Term		
2nd Term		
3rd Term		

ne	Class	Adm. No.	House	Sex

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AFFECTIVE & PSYCHOMOTOR DOMAINS

SUMMARY

SS

SCHOOL BORNO STATE MINISTRY OF EDUCATION *SENIOR SECONDARY*

CUMULATIVE RECORD (TRANSCRIPT)
part a COGNITIVE DOMAIN

Grades awarded according to rank order in Year Group A: top 10%, B: next 20%, C: next 40%, D: next 20%, E: last 10%

A CORE SUBJECTS NOTE: The ACTUAL subject to be taken should be written in after the colon. (see footnotes)	FIRST YEAR			SECOND YEAR			THIRD YEAR			COURSE C.A. TOTAL			FINAL RESULT		
	Weighted Score 15	Grade	Entered by	Weighted Score 15	Grade	Entered by	Weighted Score 10	Grade	Entered by		Score 40	Entered by	Score 100	Grade	Entered by
1 English Language										1					
2 Nigerian Language										2					
3 Mathematics										3					
4 Science Subject*:										4					
5 Arts Subject **:										5					
6 Vocational Subject***:										6					
B ELECTIVES (see footnotes)															
1										1					
2										2					
3										3					
4										4					

A. CORE SUBJECTS.
*The Science Subject should be chosen from one of the following - Physics, Chemistry & Biology.
**The Arts Subject should be chosen from one of the following - Literature in English, History & Geography.
***The Vocational Subject should be chosen from Agricultural Science or any other Vocational Subject.

B. ELECTIVES. These are the optional subjects chosen to give a suitable combination with the Core Subjects for future studies. Normally only THREE electives are chosen, one of which may be dropped in the final year. Observe any WAEC Regulations which may prohibit certain subject combinations.

RESULTS OF PLACEMENT APTITUDE TESTS

Entered by

Date

PLACEMENT RECOMMENDATIONS

1

2

3

PRINCIPAL

Date

Name	Adm No.	Date of Adm.	Date of Dep	House	Sex

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Form CA 3b
SS

CUMULATIVE RECORD (TRANSCRIPT)

part b AFFECTIVE & PSYCHOMOTOR DOMAINS

SENIOR SECONDARY

Rating Scale, 5 - excellent 4 - good 3 - fair 2 - poor 1 - very poor

I. PERSONAL & SOCIAL QUALITIES	1st Rating	Entered by	2nd Rating	Entered by	Final Rating	Entered by
1 Punctuality						
2 Attendance at class						
3 Carrying out assignments						
4 Participation in class						
5 Neatness in appearance						
6 Politeness						
7 Honesty						
8 Initiative						
9 Relationship with others						
10 Self control						
11 Helping others						
12 Sense of responsibility						
13 Emotional stability						
14 Physical health						

II. ATTITUDES (From Attitudes Inventory)						
1 Attitude to study						
2 ... teachers						
3 .. schoolmates						
4 .. school property						
5 .. school programmes						

FIRST YEAR Summary of interests, co-curricular & outdoor activities & positions held.

Signed

SECOND YEAR Summary of interests, co-curricular & outdoor activities & positions held. Date

Signed

FINAL YEAR OVERALL SUMMARY of personal & social qualities attitudes, interests, activities & positions held. Date

Signed

Year Group Tutor

Name	Adm. No.	Date of Adm.	Date of Dep.	House	Sex

PRINCIPAL

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