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ASSESSMENT OF QUALITY ASSURANCE IN NIGERIA CERTIFICATE IN EDUCATION PROGRAMMES FOR EFFECTIVE TEACHING AND LEARNING OF MATHEMATICS AND BASIC SCIENCE IN PRIMARY SCHOOLS

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ABSTRACT

The study assessed the role of quality assurance practice in Nigeria Certificate in Education programmes for effective teaching of mathematics and basic science in primary and upper Basic schools in North Central Zone of Nigeria. The population for the study was mathematics and science lecturers from five colleges of

INTRODUCTION

Education forms the foundation of every society and serves as a vital tool for nation-building. Consequently, the quality of education provided to a nation's citizens has a significant impact on the nation's overall development. The Federal Republic of Nigeria in her National Policy on Education, affirms that no education system can rise above the quality of its teachers, [5]. For effective teaching and learning of mathematics and basic science to be achieved in a nation, the principal actors of learning are the teachers, learners and the environment must be comparatively organized. Preparation of teachers through Nigeria Certificate in Education (NCE) programme was adopted as a bench mark for the production of quality teachers to teach at the primary school level [6]. Teacher education encapsulates the activities and processes engaged in the raising of the quality of teachers for the

education in the North Central Zone of Nigeria. 100 mathematics and science lecturers were sampled from the population of 956 lecturers usingmulti-stage stratified random sampling. Descriptive survey design was employed for the study. Four research questions were formulated for this research work. The instrument "Quality Assurance Practice Questionnaire" (QAPQ) was used for data collection. The reliability was obtained using Cronbach Alpha with index of 0.89. Mean, standard deviation and percentage were used to analyze the research questions. The study found out that the Quality Assurance Unit has positive impacts on the implementation of Minimum Standards, staff recruitment, teaching and learning process and students admission policy in Colleges of education in the North Central geopolitical Zone of Nigeria. This shows that there is a positive impact of quality assurance on the teaching and learning of Mathematics and Science subjects in the colleges of education. It was recommended that Nigeria government through Nigeria Commission for Colleges of Education (NCCE) should ensure strict adherence to all the quality assurance strategies by all Colleges of Education in Nigeria.

Keywords: Quality Assurance, Mathematics, Basic Science, Nigeria Certificate in Education.

function of teaching and learning. Teacher education is a recurrent subject of discourse by relevant stakeholders in the Nigerian educational system. Hence, the importance of quality in teacher education is well recognized, [9].

Quality assurance in education is a systematic approach to maintaining and improving the quality of educational offered. It involves setting clear standards for teaching, curriculum, facilities, and other resources; regularly monitoring and evaluating educational processes and outcomes; and making ongoing improvements based on the findings. Quality assurance in education ensures that institutions provide high standards of teaching, learning, and outcomes that meet both regulatory requirements and the expectations of students and society. Through quality assurance, educational institutions can continually

assess and enhance their teaching methods, curriculum, and overall environment, fostering an atmosphere that supports both academic and personal growth [22].

The universal basic education adopted in Nigeria in the year 2004 [5] tagged 9-3-4 system of education emphasizing foundational skills such as numeracy, basic science, integrating ICT and vocational training. The programme is designed to address persistent issues of teachers' quality, infrastructure, and funding. The re-introduction of Universal Basic Education (UBE) in Nigeria after Universal Primary Education (UPE) was launched in 1976 is a pointer to the fact that government desires quality and effective education at primary and junior secondary schools levels for the nation to realize her national objectives. In order to realize the goals of UBE in Nigeria, government shall take necessary measures to ensure that every child shall be taught mathematics and basic science in their first nine years of basic education [5]. To achieve this, Nigeria Certificate in Education (NCE) programmes should be accorded with all needed supports by all stakeholders and should not be allowed to face out like grade ll teachers colleges in Nigeria. The NCE teachers produced through this programme which are directly to be engaged for UBE should be of quality and well trained through NCE programmes.

Nigeria Certificate in Education has helped in establishing a strong foundation in mathematics and science is crucial for young learners. Beyond the joy students can find in exploring these subjects and the confidence gained from mastering them, early academic preparation paves the way for financial literacy, critical thinking, and sound decision-making. Additionally, mathematics and science skills are vital to a nation's economic health, as they support a workforce adept in these areas. Early science education, in particular, gives students essential skills to engage with scientific concepts throughout their academic journey and beyond. It's essential that young students are "prepared to bring knowledge and skill to solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions." Elementary teachers play a pivotal role in shaping students' attitudes toward math and science, nurturing a love for these subjects and dispelling misconceptions that math is difficult or that science is exclusive. As

reported by the National Science Foundation's Science and Engineering Indicators, "Teacher quality is one of the most important factors influencing student learning."[18].

No doubt education has become the most powerful tool for development in any nation and the value of a teacher in achieving that cannot be overemphasized. Most of the countries tagged as most powerful countries today in science and technology is as a result of the solid education background they have for their citizens. Education is the most powerful instrument for the provision of the requisite knowledge for the empowerment needed for full actualization of human potentials [7]. Mathematics and science education are part of inclusive education, since every child needs their knowledge in life for self-reliance and societal transformation.

The study of basic mathematics and science at this levels is essential for the development of scientific and technological innovations that drive economic growth and social development. We are living in a changing world where mathematics and science play an important role in day to day life activities. Mathematics education provides students ability to think logically and critically in order to see relationship between mathematics and their environment. Mathematics enable one to be creative, logical reasoning, accuracy, abstract or spatial thinking, critical thinking, problem solving ability and including effective communication skills [4]. It has made advances into every human endavours and provide necessary skills for all to excel in every aspect of life. Mathematics and Basic Science are compulsory subjects offered by all from nursery through basic education to secondary education in Nigeria, because of the importance attached to them by the Government.

It is believed that no meaningful teaching and learning can be achieved in mathematics and science if the subjects are not handled by competent hands. For pupils to benefit maximally, the subjects must be handled by well trained teachers.. The teacher effectiveness in a classroom is a function of the training he/she acquired. The quality of a teacher largely depends on the qualification and training of the teacher. A programme that produces excellence and high achievement is generally believed to be taught by qualified, trained and committed teachers. The more a teacher exposes to trainings, the more

efficient such a teacher in teaching and learning process. To improve the quality of teachers produced in colleges of education, supervision of instructions is seriously needed. In other words, to enhance the teaching and learning of teachers in colleges of education, a supervisory body like Quality of Assurance Unit is needed. It was as a result of this that National Commission for Colleges of Education (NCCE) established Quality of Assurance Unity in Colleges of education to ensure that guidelines provided in this implementation framework are followed.

Conceptualization of Quality Assurance

Quality of a life is largely depended on the treatment such a life received, so is also quality of education in the life of a learner. Quality of assurance is essential in every aspect of human endavour. Quality assurance plays a major role in determining the end product of a business or an educational setting. According to [15], quality assurance is a systematic management and assessment procedures adopted by an institution and system so as to monitor performance against objective and to ensure achievements of quality output or the outcome and quality improvement. Academic quality assurance is a vital instrument in achieving quality of academic and structural provision to realizing objective attainment of set standards. That is, it is a vital instrument in achieving quality of teaching-learning process, curriculum content, building and physical facilities for the realization of the set goals. In view of the above, the quality of a teacher cannot be compromised in our educational system. Quality assurance produces a basic necessary preparation for Nigeria Certificate in Education (NCE) to produces competent teachers. This process also lays solid foundation in colleges of education programmes to enhance quality of NCE products. Federal Government of Nigeria [5] stipulated that quality of assurance can be ensured through regular and continuous supervision of instruction and other educational services. [2] see quality assurance in teaching and learning as a process of improving the quality and teaching for quality output by employing hands that are within or outside the school.

Quality Assurance and the Nigerian System of Education

The effectiveness of Nigeria's National Certificate in Education (NCE) programs, specifically in preparing teachers for mathematics and basic science instruction at the primary level, requires thorough quality assessment to strengthen the nation's educational foundation. Quality assurance serves as a vital framework through which Nigerian educational institutions uphold both national standards and global best practices. As the fundamental qualification for primary school teachers, NCE programs must maintain rigorous quality controls to ensure graduates can effectively teach mathematics and science concepts. This quality oversight is particularly critical given the programs' direct impact on primary education outcomes and their role in developing competent educators.

For effective supervision or assessment of higher institutions in Nigeria, the federal government of Nigeria established some commissions such National Universities Commission [NUC], National Commission for Colleges of Education [NCCE] and the National Board for Technical Education [NBTE] to supervise higher institutions with the aim of ensuring quality in higher education in Nigeria. With the recent decline in the quality of higher education in Nigeria every stakeholder in higher education believed that there is problem of ineffective supervision on the part of the various commissions mandated to supervise the various higher institutions in Nigeria. [13] The mandate of NCCE includes, laying down standards for all programmes of teacher education, accreditation of certificates and academic awards and approval of guidelines for accreditation. The commission’s goal of quality assurance is pursued vigorously. However, one of the aims of producing NCE teachers is to boost the academic knowledge of primary school teachers and a few who may be teaching in junior secondary schools. The delicate nature of the group they teach (i.e. very young) needs solid background upon which their higher education can be built. Any neglect of quality in the training of primary school teachers and seemingly non-realization of the impact of effective teaching and learning at the primary school level would have a devastating effect on our educational system in Nigeria, [6]

The quality assurance process encompasses multiple key components: establishing explicit teaching standards, developing comprehensive curricula, maintaining adequate facilities, and managing essential resources. Regular monitoring activities track educational effectiveness through systematic evaluation of both teaching methods and student outcomes. These findings drive continuous improvement efforts across all areas. The process relies on various assessment tools, including third-party evaluations, student performance measurements, and structured feedback systems. This comprehensive approach to quality control promotes accountability and transparency, helping stakeholders understand and trust the educational standards being maintained. The end objective is to foster a learning environment that delivers fair, meaningful, and high-quality education, enabling students to thrive in their future endeavors.

The Nigerian education system has faced challenges in achieving consistent quality in its teaching programs. Problems such as inadequate funding, poor infrastructure, unqualified teachers, and outdated curricula are persistent issues, [8]. These challenges hinder the delivery of quality education in many institutions, leading to a situation where graduates of these programs may not possess the skills and knowledge required to effectively teach mathematics and basic science in primary schools.

Quality assurance in NCE programs is essential to ensure that prospective teachers receive rigorous training aligned with national and international standards. The NCCE has established benchmarks for teacher education, covering admission, facilities, curriculum, and teacher-student ratios. However, financial constraints, lack of oversight, and poor governance have hindered many colleges of education from meeting these standards.

Quality assurance in education relies on various theories to assess and improve teaching, learning, and institutional performance. These theories, including Total Quality Management, Stakeholder Theory, Continuous Improvement, Input-Process-Output, Program Theory, Accountability, Benchmarking, and Transformational Learning, provide a framework for evaluating and enhancing educational practices.

Total Quality Management, originally developed for manufacturing by Deming and Juran, emphasizes that quality improvement must be continuous and involve everyone in the organization. When applied to education, it focuses on enhancing student learning experiences through systematic evaluation and improvement of teaching methods, with active participation from faculty and staff. Stakeholder Theory, introduced by Freeman, helps educational institutions recognize that their success depends on satisfying various groups' needs - not just students, but also employers, faculty, and the broader community. This broader perspective ensures that educational programs remain relevant and valuable to all parties involved.

Continuous Improvement builds on TQM principles, promoting regular assessment and refinement of educational practices. This involves gathering feedback, analyzing outcomes, and making incremental changes to enhance teaching effectiveness and student learning.

The Input-Process-Output model provides a structured way to analyze educational quality. It examines everything from student admissions and resources (inputs), through teaching methods and support services (processes), to learning outcomes and graduate success (outputs).

Program Theory helps institutions understand how their educational initiatives create change. It connects resources and activities to desired outcomes, making it easier to identify what works and why in educational programs.

Accountability Theory emphasizes the importance of setting clear standards and measuring performance against them. This helps institutions maintain high educational standards and demonstrate their effectiveness to accrediting bodies and the public.

Benchmarking involves comparing institutional practices and outcomes with industry leaders to identify areas for improvement. This practical approach helps schools adopt proven successful practices while adapting them to their specific context.

Transformational Learning Theory, developed by Mezirow, focuses on how education can fundamentally change students' perspectives and capabilities. It emphasizes critical thinking and adaptation skills essential for lifelong learning.

These theories, when applied together, provide a comprehensive framework for maintaining and improving educational quality while ensuring responsiveness to changing needs and standards in education, [10].

THE IMPORTANCE OF QUALITY ASSURANCE

The importance of quality assurance in Nigerian higher institutions, especially colleges of education, cannot be overstated. At its core, quality assurance ensures that graduates possess the necessary competencies for their chosen professions. In NCE programs specifically, this means developing teachers who demonstrate mastery in both subject knowledge and pedagogical skills, particularly in critical areas like mathematics and basic science.

Quality assurance serves as a guardian of curriculum relevance, ensuring educational content remains current and applicable. This is particularly crucial in teacher education, where instructional methods and subject matter must evolve alongside educational advances and scientific discoveries. Through systematic quality control, institutions can maintain updated curricula that prepare teachers for contemporary classroom challenges, [3].

The framework also establishes clear institutional accountability by monitoring resource allocation and utilization. This includes oversight of essential facilities like libraries, laboratories, and teaching materials. Given the infrastructure challenges faced by many Nigerian institutions, quality assurance mechanisms help identify critical areas requiring improvement and ensure optimal use of available resources.

Furthermore, robust quality assurance enhances institutional reputation and public trust. When colleges of education maintain high standards, they boost confidence in their teacher training programs, ultimately leading to better employment prospects for graduates and improved educational outcomes in primary schools. Quality assurance also drives institutional growth through continuous evaluation and improvement. Regular assessments help colleges identify strengths and areas needing enhancement, enabling them to develop targeted improvement strategies. This ongoing refinement process ensures that educational standards remain high and responsive to changing needs, [14]

In today's interconnected world, quality assurance helps Nigerian institutions maintain international competitiveness. By adhering to global educational standards, NCE programs can ensure their graduates are competitive worldwide and facilitate valuable international partnerships. This systematic approach to maintaining educational standards is essential for improving primary education outcomes, particularly in fundamental subjects like mathematics and basic science. By strengthening quality assurance mechanisms within NCE programs, Nigeria can enhance its educational system and better prepare the next generation of teachers, [3]

Internal Quality Assurance Unit in the Colleges of Education

In a bid to improve the minimum standard in colleges of education in Nigeria, the National Commission for Colleges of Education (NCCE) established the Internal Quality Assurance Unit for routine monitoring and evaluation, supervision and inspection of the programmes. This unit also helps in the control of admission policy, maintaining minimum standards, staff recruitment, and teaching supervisions in the colleges. To achieve this noble objectives, the IQAU need some degree of autonomy and full support of college management. [16] observed that quality assurance mechanisms at the tertiary education level is both internal and external, in his view, the internal quality assurance involves the processes of evaluation, maintenance and promotion within the system. Some of the components of internal quality were identified to include, establishment of admission requirements, staffing, course design and development, internal assessment for approval of new programmes, periodic training workshops to sensitize facilitators and lecturers who are the mainstay of the programme and external examination system.

Some of the problems confronting QAU are:

a. In adequate budgetary provision by government for quality assurance activities
b. Late release of fund for quality assurance activities by the management
c. No prescription of sanctions for non –compliance to guide lines, which gives room for misbehavior.

d. In adequate report to college managements and feedback to and from end-users

Statement of the Problem

Quality education guarantees quality performance of pupils in their life endavours. It leads to self-sufficiency and good characters. Since education is a powerful weapon to fight poverty, ignorance and free society from darkness, there is need to build a strong solid foundation for NCE programmes to cater for primary school education. Introduction of Quality Assurance Unit in our colleges is a testimony of the seriousness of NCCE for quality teaching and learning to produce quality teachers.

It is no longer news that the performance of students in mathematics and science in Senior Secondary Examination and Primary School leaving certificate is grossly poor. This has been major concern for parents, society, educators and government, especially Niger state government of Nigeria, who spent a lot of money in funding education but to no avail. Therefore, this study finds out the effect of quality assurance on the NCE programmes and its implication on teaching and learning of mathematics and science in primary schools in the north central zone of Nigeria

Objective of the study

Experience over the years has shown that only the teachers that are qualified and well trained really convey the ideas or facts in the teaching- learning process. The quality a teacher possess in his field of profession will determine the products he will produce. The re-introduction of Universal Basic Education (UBE) in Nigeria after Universal Primary Education (UPE) was launched in 1976 is a pointer to the fact that government desires quality and effective education at primary and junior secondary schools levels for the nation to realize her national objectives. Since this level of education may be the last education such a learner may obtain, there is a need for standard to be laid. Truly, this can only be done by raising the quality of the certificate of the concerned teachers. Hence the purpose of the study is to see how quality assurance can improve the certificate of the pre-service teachers for effective teaching of

mathematics and science through NCE programmes in the north central of Nigeria.

The study is specifically designed to;

1. Improve the quality of certificate of mathematics and science of pre-service teachers through NCE programmes.
2. Maintain the standards of NCE programmes in the zone for optimal output.
3. Project the image and visibility of Nigeria certificate for primary mathematics and science teachers.

Research methodology

The study adopted a Cross-sectional descriptive survey research method. This choice was made to enable researchers collect data from uniform subjects of quality assurance in the colleges of education in the north central geo-political zone within a uniform time. The population of the study comprises 13 colleges of Education and 956 Mathematics and science lecturers in the zone.

Sample and Sampling Techniques

The Multi-stage stratified random sampling procedure was used in selecting the sample for the study. The first stage was done by grouping the geo political zone into clusters of three states. At least one college of education was selected from each state through stratified random sampling procedure. In determining the sample for the study, the researcher adopted the Central Limit Theory (2006) table of determining sample size for research activities and Sambo (2008) who recommended that the sample size N≥30 are viable for experimental study of this nature.Therefore, the sample consisted of 100 mathematics and science lecturers drawn from 5 randomly selected colleges of education in the zone.

Instrumentation

To help collect data for this study, the researchers designed a four points Likert scale structured questionnaire titled "Quality Assurance Practice Questionnaire (QAPQ)". This is subdivided into two parts. Part A measures

demographic information such as name of school, gender, working experience and student teachers ratio while part B contains 22 items that have their primary focus on quality assurance in Nigeria Certificate in Education. The questionnaire was structured on four-point Likert scale of Very great extent (VGE), Great extent (GE), Low extent (LE) and Very low extent (VLE) with nominal value of 4, 3, 2 and 1 assigned to them respectively. Mean and percentages were used to answer the research questions

Validity of instrument

The researchers designed instrument items were validated by experts in science Education, measurement evaluation and quality assurance unit of three different tertiary institutions. Based on their suggestions, the necessary corrections and modifications were made; and the validity of the test items was found to be within the ability level of the respondents.

Pilot Testing of the Instruments

The pilot test was conducted at Federal College of Education, Kaduna state, Nigeria which is not part of the population for the study. The science and mathematics lecturers were used for the pilot testing of the instruments. The questionnaire tagged *QAPQ* was administered to the lecturers and the questionnaires were retrieved, scored and recorded accordingly. The aim of the pilot study was to determine the effectiveness as well as the efficiency of the research instruments; validity and reliability coefficients.

Reliability of the Instruments

The result of the pilot study was used to determine the reliability coefficient of the *QAPQ*. To test the reliability of the *QAPQ* items, a split-half method was adopted. Cronbach alpha-20 (α_{20}) was employed to estimate the reliability coefficient of the Likert's scale test items and was found to be 0.89. The result shows that the test items were consistent and within the ability level of the teachers and administrators and could be used for data collection of this study.

Procedure for Data Collection

The research assistants were trained by the researchers using *QAPQ*. The training of the research assistants lasted for a 7 days. The instrument for data collection was administered to the lecturers in their respective colleges through the help of the research assistants after permission have been sought

from the respective college authorities. The research assistants collected the questionnaires from the respondents within the timeline. Out of 100 instruments administered only 94 were retrieved. The information gathered from the administration of this instrument was used to evaluate the role ofQuality Assurance in Nigeria Certificate in Education programmes for effective teaching and learning of mathematics and basic science in primary schools in Niger State of Nigeria.

Procedures for Data Analysis

After the retrieval of research instrument, the instruments were scored by the researchers for all the respondents. The data collected from the study were analyzed using descriptive statistics of mean, standard deviation and average mean to answer the research questions using SPSS package version 22. The need for using mean, standard deviation and average mean is to summarize key attributes of the data.

Research Questions

1. To what extent does the implementation of students' admission policy affect the quality assurance in the departments of mathematics and science in colleges of education in the north central geo-political zone of Nigeria?
2. To what extent does the minimum standard compliance affect the quality assurance in the departments of mathematics and science in the colleges of education in the north central geo-political zone of Nigeria?
3. To what extent does the quality assurance affect the supervision of teaching/learning in the departments of mathematics and science in the colleges of education in the north central geo-political zone of Nigeria?
4. To what extent does the recruitment of staff affect the quality assurance in the departments of mathematics and science in the colleges of education in the north central geo-political zone of Nigeria

Results

Research Question 1

To what extent does the implementation of student admission policy affect the quality assurance in the departments of mathematics and sciences in colleges of education in the north central zone of Nigeria?

Table 1: Extent to which Admission Policy Affect the Quality Assurance in the departments of sciences and mathematics in colleges of education in the north central zone of Nigeria

ITEMS	Great Extent %	Large Extent %	Mean	Sta. Dev	Decision
Students are admitted strictly on NCCE requirement policy	81 86.1%	13 13.9%	3.2	0.8	GE
My department do admit more than the required number of students as stipulate by NCCE	36 38.3%	58 61.8%	2.2	1.1	LE
Under-aged students are admitted to run programmes in my department	16 17.0%	78 83.0%	1.8	0.8	LE
The Quality Assurance Unit (QAU) ensures effective dissemination of admission policy on internet	61 64.9%	33 35.1%	2.7	0.8	GE
QAU ensures orientation programmes for newly admitted students	73 77.7%	21 22.3%	3.0	1.1	GE
Information on admitted students are promptly posted on the notice board	73 77.7%	21 22.3%	3.0	0.8	GE
Average Mean = 2.7 Decision Rule > 2.5 = Agree, < 2.5 = Disagree					

Table 1 presents the results on the extent to which the implementation of student admission policy as an aspect of quality assurance affect students' enrollment in the department of mathematics and sciences in colleges of education in the north central zone of Nigeria. The result shows that 86.1% (majority) of the respondents agreed that students were admitted strictly based on NCCE requirement policy. This implies (Mean = 3.2; S.D = 0.8), the result further shows that majority (61.8%) of the respondents disagreed that their departments usually admit more than the carrying capacity as required by the NCCE. (Mean = 2.2; S.D = 1.1). In addition, 83.0% (majority) of the respondents do not agree that under-age students were admitted in their

departments. (Mean = 1.8; S.D = 0.8). More so the result opined that 77.7% of the respondents agreed that quality assurance ensures orientation programmes for newly admitted students. (Mean = 3.0; S.D = 1.1), and majority (77.7%) of the respondents agreed that information on admitted students are promptly posted on the notice board. (Mean = 3.0; S.D = 0.8). From the study it was inferred that implementation of student admission policy as an aspect of quality assurance improve the standard of enrollment in the department of mathematics and science in the colleges of education in the North Central Zone of Nigeria because average mean (2.7) is greater that than the decision rule (2.5).

Research Question 2

To what extent does the minimum standard compliance affect the quality assurance in the department of mathematics in colleges of education in the north central zone of Nigeria?

Table 2: Extent to which Compliance with Minimum Standard Affect the Quality Assurance in the Department of Mathematics in Colleges of Education in the North Central Zone of Nigeria

ITEMS	Great Extent %	Large Extent %	Mean	Sta. Dev	Decision
QAU ensures that lecturers comply strictly to minimum standard in their teaching	79 **84.1%**	15 **16.0%**	3.2	0.8	**GE**
QAU does not give teachers room to be innovative in their teaching	18 **19.2%**	76 **80.8%**	1.9	0.7	**LE**
Information about academic calendar are not promptly released	25 **26.6%**	69 **73.4%**	2.0	0.9	**LE**

QAU monitors the conduct of examinations	84 **89.4%**	10 **10.7%**	3.4	0.7	**GE**
QAU ensures that test items are moderated externally	68 **72.3%**	26 **27.6%**	3.0	0.9	**GE**
QAU allows lecturers to summit results anytime	16 **17.0%**	78 **83.0%**	1.8	0.9	**LE**
Average Mean = 2.6 Decision Rule > 2.5 = Agree, < 2.5 = Disagree					

Table 2 shows the results on the degree to which minimum standard compliance as an aspect of quality assurance affect the department of mathematics and science in colleges of education in the north central zone of Nigeria. The results revealed that 84.1% (majority) agreed that quality assurance ensures that lecturers comply strictly with minimum standard in their teaching. (Mean = 3.2; S.D = 0.8), in addition 80.8% (majority) disagreed with the assertion that quality assurance does not give teachers opportunity to be innovative in their teaching. (Mean = 1.9; S.D = 0.7). In other words, the study showed that QAU supports innovation in the college of education. Furthermore the results show that 73.4% (majority) of the respondents disagreed with statement that information about academic calendar are not promptly released. (Mean = 2.0; S.D = 0.9), in the same manner it was discovered that larger percentage (89.4%) of the respondents opined that quality assurance monitors the conduct of examination. (Mean = 3.4; S.D = 0.7). Also 72.3% (majority) were in agreement that quality assurance ensures external moderation of test items. (Mean =3.0; S.D = 0.9). More so 83.0% of the respondents responded that quality assurance does not allowed the lecturers to summits result anytime. (Mean = 1.8; S.D = 0.9). Likewise 83.0% (majority) of the respondents agreed that quality assurance keeps sample of question papers and results. (Mean = 3.2; S.D = 0.8). From the findings, it can be deduced that compliance with minimum standard as an aspect of quality assurance

improve the activities of teaching-learning process in the department of mathematics in colleges of education in the north central zone of Nigeria because the average mean (2.6) is > than the decision rule (2.5).

Research Question 3

To what extent does the quality assurance affect the supervision of teaching/learning process in the department of mathematics in colleges of education in the north central zone of Nigeria?

Table 3: Effects of Quality Assurance on Supervision of Teaching/Learning in the Department of Mathematics in Colleges of Education in the North Central Zone of Nigeria

ITEMS	Great Extent %	Large Extent %	Mean	Sta. Dev	Decision
QAU supervises classes during lectures, practical and workshops	53 **56.3%**	41 **43.6%**	2.6	1.0	**GE**
QAU encourages students centered - learning approach	67 **71.2%**	27 **28.7%**	2.9	0.8	**GE**
QAU ensures course content coverage in line with NCCE minimum standard	76 **80.9%**	18 **19.2%**	3.1	0.8	**GE**
QAU follows up students' academic activities	61 **64.8%**	33 **35.1%**	2.8	0.8	**GE**
QAU does not adequately monitor the conduct of examination	20 **21.2%**	74 **78.7%**	1.9	0.9	**LE**
The QAU allows academic staff to be over loaded with so much work.	23 **35.1%**	61 **64.9%**	2.2	0.9	**LE**
Average Mean = 2.6 Decision Rule > 2.5 = Agree, < 2.5 = Disagree					

Table 3 presents the results of effect of QAU on supervision of teaching/learning in the departments of mathematics and science in colleges of education in the north central zone of Nigeria. The result shows that majority (56.3%) of the respondents agreed that quality assurance unit supervises classroom/ lecture room activities. (Mean = 2.6; S.D =1.0), in the same way 71.5% agreed that quality assurance encourages student-centered learning method. (Mean = 2.9; S.D = 0.8). In addition 80.9% (majority) opined that quality assurance ensures course content coverage in line with NCE minimum standard. (Mean = 3.1; S.D = 0.8). Furthermore the finding revealed that majority (64.8%) agreed that quality assurance follow up students' academic activities. (Mean = 2.8; S.D = 0.8). Contrarily the study shows that 78.7% (majority) of the respondents disagreed that quality assurance does not adequately monitor the conduct of examination. (Mean = 1.9; S.D = 0.9). In order words, QAU monitors the conduct of examination. Also the study shows that 64.9% (majority) disagree that quality assurance allows high workload for the academic staff. (Mean = 2.2; S.D = 0.9). Meaning that there is no excess loads for the lecturers. From the findings, it shows that the quality assurance unit supervises teaching/learning in the department of mathematics in colleges of education in the north central zone of Nigeria because the average mean (2.6) is > than the decision rule (2.5).

Research Question 4

To what extent does the quality assurance unit monitors the recruitment of staff into in the departments of mathematics and sciences in colleges of education in the north central zone of Nigeria?

Table 4: Extent to Which Recruitment of Staff Affect Quality Assurance in the Department of Mathematics in Colleges of Education in North Central Zone of Nigeria.

ITEMS	GE	LE	Mean	Sta. Dev	Decision
QAU ensures quality standard in items of staff employment	49 **52.1%**	45 **47.8%**	2.6	1.0	GE
My school do not give staff adequate in- service training and development	24 **25.5%**	70 **74.5%**	1.9	0.9	LE

Employ more non-academic staff than academic staff	34 **36.1%**	60 **63.8%**	2.3	0.8	**LE**
Staff promotions are not done as and when due	29 **30.8%**	65 **69.1%**	2.1	1.0	**LE**
Average Mean = 2.2 Decision Rule > 2.5 = Agree, < 2.5 = Disagree					

Table 4 presents the results of the role of QAU in the recruitment of staff in the department of mathematics in the colleges of education in the north central zone of Nigeria. The result shows

that 52.1% (majority) of the respondents agreed that quality assurance ensures quality standard in terms of staff employment. (Mean = 2.6; S.D = 1.0), also 74.5% (majority) disagreed that their colleges did not give adequate staff training and developments. (Mean = 1.9; S.D = 0.9). In addition 63.8% (majority) disagree that their colleges employed more non-academic staff than academic staff. (Mean = 2.3; S.D = 0.8), and 69.1% (majority) also disagreed that staff promotions were not done at when due. (Mean = 2.1; S.D = 1.0

The results obtained are supported by Fowoyo, et al, 2019 which stated that implementation of students' admission policy, minimum standard compliance and teaching- learning process as aspect of quality assurance in primary schools are significantly high.

Discussion of the Results

The result in table 1 shows that the students were admitted strictly based on NCCE requirement policy. The study also shows that implementation of student admission policy as an aspect of quality assurance is significantly high in the department of mathematics and sciences in the colleges of education in the North central zone. This result is in line with the work of [19] who conducted a research work on Quality Assurance and Students' Academic Performance in North-Western State Universities in Nigeria and found out that students were admitted base on NUC minimum standards on student enrolments. This shows that colleges of education adhere strictly to NCCE requirement policy in term of admission. Though, both are Tertiary Institutions in the country, however, this work differ from the present study in terms of

geographical location and type of institution used.Large class size are detrimental to learning, therefore the need to keep up the student admission policy is necessary to maintains quality.

The result in the table 2 revealed that quality assurance unit ensures that lecturers comply strictly with minimum standards in their teaching. The study revealed that the concerned departments complied with minimum standards in dissemination of instruction for a better learning by the students. Quality assurance ensures course content coverage in line with NCE minimum standards. This is result agreed with the work of [1]; [17] and [21] who investigated a topic "Strategies considered effective by Business Educators for quality assurance in business education programme in universities in South-South Nigeria" and submitted that quality assurance unit strict compliance to standards is top-notch. This implies that colleges education admit student based on the carrying capacity of the departments. To make learning more effective, lectures should maintain the minimum guideline and standards setup by their supervisory body.

The result in table 3 agreed that quality assurance unit supervises classroom/ lecture room activities and that quality assurance as an aspect of supervision encourages student-centered learning method. The findings also revealed that supervision of teaching/learning by the quality assurance unit will lead to good learning of mathematics and sciences in colleges of education in the north central Zone. This result agree with [2] who carried out a study on "Supervision of Instruction for Quality Assurance in Effective Teaching of Mathematics among Secondary School Teachers in Enugu State" and found out that quality assurance as an aspect of supervision, encourages student-centered learning method. The need for constant supervision in the learning and teaching process cannot be over emphasized. Therefore quality assurance unit need to be constantly and consistently carry out their assignment to enhance systematic realization of the learning process.

The result in table 4 shows that quality assurance ensures quality standards in terms of staff employment which in return will promote effective teaching-learning process. This result is in consonant with the work of [21] who carried out a study on "Quality Assurance in Nigeria's Education system: Prospect and

Challenges" and found out that quality assurance ensures quality standards in terms of staff employment which in turn promotes effective teaching-learning process. As no nation can rise above the quality of her teacher, the quality assurance unit should follow the process in staff employment by making sure qualified staffs are employed.

Conclusion

In conclusion, it was found out that students were admitted into the institutions strictly based on NCCE requirement policy. Also, that the quality assurance unit of all the colleges of education in the North central zone ensured that lecturers adhered to the minimum standard in the teaching and learning process. Furthermore the quality assurance unit also supervision lecture room activities and finally that quality assurance unit ensures quality standard in terms of staff employment.

The role of quality assurance units can go a long way in ensuring that only qualified students are admitted into the Colleges of Education, so that only the best are trained as teachers. Also, that minimum standards are maintain by all lecturers in the process of discharging their duties. The need for employing qualified lecturers cannot be over emphasized as it is against this background the process will promote effective teaching and learning.

As a result, Nigeria institution of higher learning should strive to give a total support to academic quality assurance in their programmes. Quality assurance in NCE programmes will help the pre-service teachers to acquire the necessary knowledge in their various courses for effective teaching by recruiting qualified lecturers and making sure that the lecturers meet the minimum standard. In view of this, there is need for stakeholders to support this unit to improve academic quality in our colleges of education.

Recommendations

The role of teachers are germane to successful implementation of any educational progammes. This is because the products that an educational programme produced largely depends on the quality of teachers. The

researchers therefore make the following recommendations to sustain academic quality assurance in Colleges of Education.

1. Government and other donors should make adequate budgetary provision for routine monitoring and evaluation, supervision and inspection
2. Enabling environment should be given to the entire quality assurance unit in the colleges of education in North central zone to perform optimally.
3. Lecturers should be opened to changes whenever they come, so as to produce best/competent teachers for primary schools in North Central zone of the country.
4. Lecturers should be encouraged to maintain minimum standards provided by Nigerian Commission for College of Education (NCCE) and failure to do that, prescription of sanctions for non –compliance to guidelines should be encouraged
5. Federal Government should provide more budgetary allocation for the quality assurance unit in all the College of Education in the North Central Zone of the country to enable them carry out their statutory assignments.
6. Governments should ensure the recruitment of professionally qualified lecturers and non-teaching staff in the institutions.

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