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Correlation of Total Quality Management Practices and Quality Teacher Education in Tertiary Institutions in Lagos State, Nigeria

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Abstract: *The state of education in the public tertiary institutions in Lagos state is witnessed by all. For over the years, this concern had eaten up many research records of which no tangible change has been influenced. Mistakes and errors pointed out in many of the researches are still glaring till today. What went wrong in the education sector in Nigeria or particularly in Lagos state have been dissected by many researchers. The problems of the education system have become so famous and stretched by many writers that none is left uncovered. The research explained the reason the previous solutions failed. The presence of Total Quality Management in academic is not new ground breaking news in Nigeria education. Many researchers have employed this tool in their techniques of providing solutions to the education sector. . Total Quality Management is a philosophical idea in which its manner of application depends on the culture settings of the institution concern. However, this research covered notable Total Quality Management techniques in schools including the Theoretical Framework and Empirical study on TQM.*

Keywords – *Education, Institutions, Teacher Education, Tertiary, Total Quality Management.*

I. INTRODUCTION

In all human societies, education is meant to pass on to the new generations the existing knowledge of their physical environment, to introduce individuals to the organization of society, teach them skills for performing their jobs and enjoying their leisure, as well as to inculcate sound moral values in them for their own benefit and that of the society. Thus there is a symbiotic relationship between the education industry and the society at large. . Education derives inspiration and nourishment from the society and in turn, its output contributes to the growth, renewal and development of the society [1]. Every society, whether simple or complex, has its own system of educating its youth; and education for good life has been one of the persistent concerns of man throughout history. African education emphasizes social responsibility, job orientation, and political participation, spiritual and moral values. Moreover, education has been from the genesis of the World, the process through which man makes effort to better the lot of himself and his environment. At the family, community, state and federal government levels, education is discussed, planned and processed. It is believed that education makes both the person and the nation; it also influences values and attitudes [2].

In Nigeria, there was the epoch of the traditional education when there were no formally established places for teaching and learning - the schools. The education of the child predominantly took place in the family where the child learnt by doing – learning the trade of the father if a boy or that of the mother, if a girl. In this traditional setting, all adults were teachers and all children were learners. The objectives were functional and utilitarian [3]. Their education was qualitative enough to keep them afloat of the vagaries of life. However, with the coming of the Europeans into Africa, aside their missionary activities, these non-Africans brought along western educational system, thus the first western school was built in Nigeria in 1843 by the Methodist. It was the Anglican Church Missionary Society that later established chains of missions and schools in 1850s and followed by the Roman Catholics in the late 1850s. Consequently, Western education started spreading like wildfire throughout the country as the average Nigerian family started to embrace it, believing it to be a vehicle for social engineering, of moving from the lower rung of the economic ladder to the apex as epitomized by some educated Nigerians who rubbed shoulders with the white ruling class.

Ejiogu [4], in his account of the development of private and public schools asserts that, originally, primary education in colonial Nigeria was run as private concerns of the missionaries who set up the primary schools. The basic aim of giving education then was for evangelism and the British colonial administration did not concern itself with the running of schools. This was the situation in 1842 to 1882. However, by 1882, it

became obvious to government that the kind of education given by missionaries was inadequate to meet government's needs for skilled clerical staff in administration and commerce. In addition, there were criticisms of the educational system by the African elites [5].

However, according to Banji and Padmashree [6], there has been a decline in quality in tertiary institutions over the last two decades owing to a confluence of factors acting in tandem, including: episodic and uncertain political-policy environments and declining investment in teaching and research facilities. It is further noted by Banji [7] that, the Structural Adjustment Programme (SAP) of a one-time military regime led to reduced educational expenditure; slowed down the scientific and technological development in Nigeria which in turn results in poor and low skills mix of graduates, low employment opportunities and diminishing value of earned income. Among other problems in Nigeria tertiary institutions are lack of research endowments and systematic research funding, limited funding, poor performance of universities, lack of funding for research facilities and programmes, physical and institutional infrastructure problems [6], non-friendly study environments (which includes cultism, physical environment, social influence among others), lack of adequate or practising quality management and lack of adequate continuous quality improvement in students' knowledge.

Imitating structures that work for the present industrialized countries, Nigeria ignores the lesson that educational institutions are products of an organic process, rather than mechanically given forms. Institutions in Western societies were created, refined and adapted to give contexts over a long historical period [6]. Successful countries made deliberate and explicit education investment at all levels to the scale of their global ranking ambition, vision, strategy and action. Low levels of human capital slow down national competitiveness and the rate of income growth. High Literacy rate contributes directly to skill's formation, and is correlated with the growth of financial services and formal banking systems and others. According to [6], within the high correlation rank in education and competitiveness, Nigeria is 127, far below South Africa (54), Mauritius (55) and Tunisia (32). Meanwhile, the desire of all parents is to bequeath qualitative and functional education to their children from nursery school to the university level. This is in compliance with the axiomatic truth that quality education is the only permanent legacy that parents can pass on to their children to ensure their future success.

Some of the indicators of quality in teacher education are the performance of lecturers in the institutions, the effect of the teaching system on the performance of students and record of achievements so far by the students produced in the society. The current state of education and poor technological development in the country has shown the failure of teacher education in their objectives (especially as defined by the role of National Commission for Colleges of Education (NCCE)). Thus, it becomes mandatory to analyze these problems and to find tangible lasting solutions. Meanwhile, one of the major factors affecting the quality of public secondary school education is teacher shortage as well as the teacher education system. According to [7], the academic and emotional qualities of intending teachers for training are critical for quality assurance and internal efficiency for professionalism in teaching in the future. Candidates who usually apply to higher institutions for teacher education in Nigeria are those who have either been denied admission or are basically unqualified for admission into such popular professions including medicine, law, engineering, architecture and so on.

Another major problem in the teacher education is the low rate of production of quality teacher from the tertiary institutions which result into ratio 1:76 of "teacher: pupils" in primary schools and secondary schools [8]. The low number of graduates going into the teaching profession is also of grave concern. The major causes are possibly due to inadequate funding levels and poor salaries. According to [9], the usual shortage of applicants seeking admission into teaching programmes in national universities in Nigeria is a pointer to why admission selection could not be rigorous as it is in other notable and popular professions. The International Labour Organisation (ILO) recommends that teachers should be selected on the basis of moral, intellectual and physical qualities. In the United Kingdom, applicants must be seen to possess certain personal qualities and characteristics before they are admitted for training. Yet in most of the Nigerian universities, Colleges of Education and Polytechnics, student's admission are usually based on obtaining the minimum academic requirements while other requirements such as emotional stability, physical uprightness and communication proficiencies are hardly given consideration.

Talented and competent teachers who lack incentives to improve their performances, who are poorly equipped with inadequate social recognition, who lack control over working conditions and witness salary payment delay, tend to seek better future careers elsewhere (probably abroad). Nigeria tends to continuously lose the committed workers and remain with the cunning ones that serve no help in improving the system. Thus, in Nigeria, the need for well qualified teachers (hence quality teacher education system) has gained pre-eminence because it is considered that teacher education is a means of not only providing teachers with the

necessary skills and knowledge needed to adequately carry out their teaching jobs but also of professional growth [10]. Teacher education is the process of training that deals with the art of acquiring professional competence and growth.

One of the main and efficient management system concepts that have proved efficient and successful over the years is that of Total Quality Management. Bergman and Klefsjö [11] define Total Quality Management as a "constant endeavour to fulfil and preferably exceed customer needs and expectations at the lowest cost by continuous improvement work to which all involved are committed, focusing on the process in the organization". Total Quality Management system is needed in Nigerian secondary school education and also in the teacher education institutes. The use of Total Quality Management is therefore advocated in tertiary institutions in Nigeria as it ensures continuous improvement with quality as the golden mark.

Total Quality Management (TQM) is probably and possibly a common factor that would likely shape the strategies of teacher educational institutions in their attempt to satisfy various stakeholders including students, parents, industries and society as a whole. TQM is about efficiency, productivity, long term success and adopting attitude that all individuals can contribute to the pursuit of continuous improvement. TQM is about driving out fear and breaking down barriers. It is about encouraging people to educate and develop themselves and believe that things can be continually improved. More than anything else, the improvement of quality is as much as the way people work together. Susan [12] states that everyone needs to believe in quality and contribute towards it by constantly improving their standards.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Understanding Quality and its Terminologies

Over the years, growing pressures for improved performance have encouraged the adoption of more comprehensive approaches to reinvent the way business is done and how institutions are run with regard to quality. As a result, many public organizations have adopted quality innovation approaches with varying degrees of success [13]. The hunt for quality has led to the emergence of many philosophies and rocket the race to stand on the edge of competition. Thus, many philosophers, especially business philosophers, have dealt with the definition of quality using different concepts and perspectives, though with a high degree of similarities within the industrial context. It is therefore critical to study the meaning of quality from the understandings of various philosophers so that the larger picture of quality management can be well understood.
Sallis [14] describes quality as 'a slippery concept'. The word quality comes from the Latin (*qualis*) meaning "what kind of". The quality of something can be said to be a part of its nature. Quality in the technical sense is largely a relative concept.

The relative definition views quality not as an attribute of a product or service, but as something which is ascribed to it—'the quality of your essay varies between good and excellent'. Quality in this sense is about being measured against criteria. It is not an end in itself, but a means by which the end product is judged as being up to (or not up to) standard. Sallis [14] explains that the relative definition of quality has two aspects to it. The first is concerned with *measuring up* and ensuring conformity to a predetermined specification. The question that is asked is 'Does this good or service do what is asked or expected of it?' This is fitness for purpose. This is sometimes called the producer definition of quality or the procedural concept of quality. Secondly, in an industrial setting, quality is achieved by products or services meeting a predefined specification in a consistent fashion. Quality is demonstrated by a producer having a system, known as a *quality assurance system that* supports the consistent production of the good or service to a particular standard or specification. Quality is also the ability of a product or service to consistently meet or exceed customer expectations [15].

Bilich and Neto [16] state that quality as a macro function of institutions must be present in the day-to-day running of an institution, in aspects such as establishment of policies, the decision process, selection of personnel, allocation of resources, definition of priorities and service delivery to satisfy customer requirements. In addition to this, the authors state that the quality approach as a strategic element has brought to institutions a new manner of conceiving quality as it engages the top decision-makers of the institution in the effort to better performance in service delivery. According to Dale [17], quality, reliability, delivery and price build the reputation enjoyed by an institution. Quality is the most important of these competitive weapons and is an extremely difficult concept to define in a few words in order to agree on a consensus definition; a trait it shares with many phenomena in business and social science [18]. TABLE 1 below shows the growth and development movement of quality in industries.

Rouse [19] defines Quality control (QC) as a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements

of the client or customer. Quality Control is similar to, but not identical with, Quality Assurance (QA). Quality control and inspection are processes that ensure that only products that meet a pre-determined specification leave the factory gate. Quality control is the oldest quality concept. It refers to the detection and elimination of components or final products that are not up to standard. However, quality control is an after-the-event process. It is divorced from the people who produce the product. Many companies are replacing or augmenting them with methods of ***quality assurance*** and ***quality improvement*** that seek to build quality into the production process by returning to workers their responsibility for quality [14].

2.1.2 Operational Definition of Terms

To avoid ambiguity, the following terms are defined as used in this study:

Quality: This is a measure of excellence or a state of being free from defects, deficiencies and significant variations brought about by strict and consistent commitment of public tertiary educational institutions through a refined process of systematic activities with adequate measures of maintaining continuous standards and improvement to produce high competent graduates.

Public Tertiary Institutions: These are the post-secondary educational institutions which include the public universities and public colleges of education in Lagos state.

Total Quality Management: Basically, it is an integrative philosophy of management for continuously improving the quality of products and processes. In academics (as used in this study), it is the refinement of academic system with introduction of standard input (society expected and field relevant curriculum), continuous improvement of standard within the academic system and the production of students that not only pass but pass excellently and competently well.

Teacher Education: It is the process of training that deals with the art and science of acquiring professional teaching competence, growth and development in the academic higher institutions. According to this study, teacher education refers to the training in Faculties of Education in Public Universities and Public Colleges of Education.

Quality Teacher Education: It is a process of training that deals with the science of acquiring necessary skills and professional growth, academic and emotional qualities of teachers for quality assurance and internal efficiency in teaching.

Practice: It is the application of TQM principles in tertiary institutions for continuous improvement of standard within the system and the production of students that not only pass but pass excellently and competently well.

From the discussions above the hypothesis is developed thus:

Ho1: There is no significant relationship between Total Quality Management practices and quality teacher education in public tertiary institutions in Lagos State.

Ho2: There is no significant relationship between Total Quality Management practices and quality teacher education in public colleges of education in Lagos State.

Ho3: There is no significant relationship between Total Quality Management practices and quality teacher education in public universities in Lagos State.

Ho4: There is no significant relationship between Total Quality Management practices and quality teacher education in Federal Government owned tertiary institutions in Lagos State.

2.1.3 Total Quality Management: A Historical Perspective

According to [13], in the early 1900's, Frederick Taylor, founder of the "Scientific Management" movement, promoted his "one best way" method as a set of scientific principles to measure the efficiency and productivity of any given task. Taylor's basic principles require four tasks that can be described as follows [20]:

1. the development of standards.
2. the fitting of a worker to a specific task.
3. the provision of means to encourage each worker to best utilization of his ability.
4. the organization controls the various phases of a project

Taylor is viewed as the "grandfather" of business process reengineering and the intellectual foundation for the work on business process change. In many respects, modern managerial practice grows largely out of Taylor's classical approach. In the late 1980's, the quality improvement movement and its potential impact on organizational theory and practice, often under the banner of Total Quality Management, appear to have several parallels with Taylor's principles [21]. In this context, Total Quality Management is more than just a slogan or a program; indeed, its movement professes a fundamental change in values, theory, and practice of modern organizations.

Edwards Deming, "the man who discovered quality" [22] and his principles with a focus on the customer and a potential impact on organizational theory and practice, developed a management theory which had a major effect on Japan where he was invited to teach about quality and productivity in the early 1950s. Dr. W. Edwards Deming persuaded and succeeded in convincing the Japanese business community that it was always cheaper to do the job right the first time than to let defects enter the production line. By focusing on quality and producing products that did not fail, could make them a force in the world market. The Japanese yielded to his words of wisdom by using Deming's ideas and principles on their quality voyage. Years went by and the Japanese's economic power boomed tremendously, bringing them from the ashes of war to an enormous industrial power in the world. Their success was linked to product quality [13].

Deming's management strategies are based on his "Plan – Do – Check – Act (PDCA)" cycle [23] and his famous "14-Points" to management to achieve this transformation [24, 25]. It was only in the late 1970s when many of their companies had lost both markets and market share to the Japanese that a number of major United States companies started to take seriously the quality message. According to [14], in the United States, the turning point is often said to have been a nationwide NBC documentary in 1980 called "***If Japan Can, Why Can't We****"*. The programme highlighted the dominance of Japanese industry in many US markets. The latter part of the programme featured W. Edwards Deming and his contribution to Japanese economic success. Since then the message of Deming and Joseph Juran, together with other quality experts, including Philip B. Crosby and Armand V. Feigenbaum, has caught the imagination of business both in the United States and in Western Europe. The Total Quality Management system is summarized in Fig. 2.0

2.1.4 Indicators of Analysis of Quality Management In Education

The quality of education and training is considered in all member states to be a concern of the highest political priority. High levels of knowledge, competence and skills are considered to be the very basic conditions for active citizenship, employment and social cohesion [26]. According to the presentation of UNICEF at the meeting of The International Working Group on Education, Florence in Italy 2000, UNICEF presented the meaning of quality education to include the following:

1. Learners who are healthy, well-nourished and ready to participate and learn and supported in learning by their families and communities.
2. Environments that are healthy, safe, protective and gender-sensitive, and provide adequate resources and facilities.
3. Content that is reflected in relevant curricula and materials for the acquisition of basic skills, especially in the areas of literacy, numeracy and skills for life and knowledge in such areas as gender, health, nutrition, HIV/AIDS prevention and peace.
4. Processes through which trained teachers use child-centred teaching approaches in well-managed classrooms and schools and skilful assessment to facilitate learning and reduce disparities.
5. Outcomes that encompass knowledge, skills and attitudes, and are linked to national goals for education and positive participation in society.

Therefore, it becomes apparent that the quality of education system is as a result of all the qualities of its individual constituting elements. There must be quality of management, quality of faculty, quality of examination and assessment, quality of performance (students and teachers), quality of infrastructures, quality of teachers and others. These are the indicators of quality management in education. Fig. 3 shows a simplified model of a secondary school. In Fig. 3, primary school leavers enter secondary school, taught by teachers and sit to either pass or fail examination. If passed, the student is ready to be received by the external customers (workforce, tertiary institutions, society and so on). If failed, the student is returned into the system; to re-sit or drop out to join the workforce as unskilled worker.

III. RESEARCH METHODOLOGY

The research design for this study is a descriptive research survey design. This research design describes a set of guidelines that connects theoretical paradigms to strategies of inquiry and methods for collecting empirical material. The study therefore attempted a description of quality teacher education in tertiary institutions in Lagos State employing the Total Quality Management concept. Thus, the study design attempted a correlation of quality teacher education and Total Quality Management Practices.

3.1 The Study Population

The population of the study included all the conventional public tertiary institutions in Lagos State. The population of the study included the Faculty of education in the universities and all colleges of education that are government owned. A total of five public tertiary institutions in Lagos State that constituted the population for the study included:

- Faculty of Education - Lagos State University (LASU), Ojo.
- Faculty of Education – University of Lagos (UNILAG), Akoka.
- Adeniran Ogunsanya College of Education (AOCED), Ijanikin.
- Federal College of Education (Technical) (FCET), Akoka.
- Michael Otedola College of Primary Education (MOCOPED) Inaforija, Epe.

3.2 The Study Sample and Sampling Technique

The study sample was constituted by the study population though the study respondents were purposively selected. Each university (Faculty of Education) consisted of 5 sample departments. From each of the departments of each university, 10 lecturers, 5 non-academic staff and 20 final year students were randomly selected in addition to the Head of Departments, Dean of the Faculty and the Vice Chancellor of each university as participants in the study.

The three Colleges of Education followed exactly the selection method with that of the universities except the inclusion of Provost instead of Vice Chancellor. Michael Otedola College of Primary Education has 5 sample Schools of study just like Adeniran Ogunsanyo College of Education while Federal College of Education Technical consisted of 4 sample Schools of study. One department was also randomly chosen from each school to be part of the study from where the participants were randomly selected. The distribution of the samples was shown in TABLE 3.

3.3 Research Instrument

This study is descriptive in nature and in order to test the hypotheses, a questionnaire was developed through as review of literature and the view of experts. The researcher constructed a questionnaire tagged Total Quality Management practices and Quality Teacher Education Questionnaire (TQMP-QTEQ). The questionnaire consisted of three sections. The questionnaire comprised 104 items in totality; nine items on the institution and the respondent, fifty-seven items on quality teacher education and thirty-eight items on Total Quality Management.

Respondents attended to the questionnaire by filling in the blank spaces and making a tick in the appropriate box that corresponds to their response to an item. In the Likert-type scale sections of the questionnaire, respondents made a circle round the figure that depicts their response to the various items therein.

3.4 Dependent and Independent Variables

Table 4 lists the dependent and independent variables that are part of this study. Six separate indicators of *Quality Teacher Education* were used as dependent variables. These indicators are quality learners, quality learning environment, quality content, quality process, quality lecturers and quality supervision and support of QTE. Variables measuring *Total Quality Management Practices* were also considered separately. The indicators for TQM Practices are management of leadership, measurement and feedback, continuous improvement, resource and infrastructural management, work environment and culture, education and training, and system and process of the institution operation.

3.5 Validity of the Instrument

Face and content validity was used to validate the instrument. The instrument was constructed with the assistance of experts in Department of measurement and evaluation , Lagos State University; the supervisor and some Senior Lecturers in the area of Educational Management using the following criteria: relevance of items to the purpose of the study and hypotheses, appropriateness of content and structure of the statement for face, content, construct and concurrent validity of the instrument. Validity was carried out to ensure necessary corrections and suggestions before final administration of the instrument.

Furthermore, factor analysis was employed using Kaiser-Meyer Olkin (KMO) value above 70 percent and Bartlet test of Sphericity with p-value less than 0.05. Results show that the indicators truly measure the construct. In this study, the KMO for quality teacher education (Section two) indicators were greater than 0.70, that is 0.885, 0.700, 0.768, 0.846, 0.883 and 0.744 for quality learners, quality learning environment, quality content, quality process, quality lecturers and quality supervision and support respectively. For Total Quality Management practices indicators, the KMO were found greater than 0.70, that is 0.811, 0.784, 0.841, 0.799, 0.719, 0.849 and 0.755 for management of leadership, measurement and feedback, continuous improvement, resource and infrastructural management, work environment and culture, education and training, and system and process of the institution operation respectively.

The result also showed that the Bartlet test of Sphericity were all significant at 0.000 for all sub-sections, which indicates correlation between variables and possibility of sharing factors.

3.6 Reliability of the Instrument

Cronbach's alpha coefficients were calculated to estimate the reliability of TQMP-QTEQ. Sekaran [27] advises that if Cronbach's alpha is more than 0.6, it means reliability of indicator is acceptable. The Cronbach alpha reliability test results from the data collected at the Faculty of Education in University of Lagos and School of Vocational & Technical Education in Michael Otedola College of Primary Education are presented in appendix II. Cronbach's alpha of 57 items used to describe quality teacher education is 0.838, and Cronbach's alpha is lower than 0.838 when any item is deleted. Analysis of result means quality teacher education has high reliability. Therefore, for this research, the QTEindicators constitute a reliable measure of quality teacher education. Cronbach's alpha coefficient was calculated in order to assess the reliability of Total Quality Management Practices indicators for this research. The average Cronbach's alpha reliability coefficient of 38 items used to describe Total Quality Management Practices is 0.879 and Cronbach's alpha is lower than 0.879 when any item is deleted. The result shows that Total Quality Management Practices variable has high reliability. Therefore, for this research, TQM practices indicators constitute a reliable measure of the variable.

3.7 Descriptive Statistics

The quantitative data collected under the survey were compiled, sorted, edited, classified and coded into a coding sheet and analyzed using a computerized data analysis package known as Statistical Package for Social Science (SPSS) version 21.0 for window.

Descriptive statistics were provided as method of data analysis for general information of respondents, quality teacher education and total quality management dimensions, and to answer the research questions. In testing the hypotheses, Pearson product moment correlation test was used to obtain the relationship between dependent and independent variables (that is, Total Quality Management TQM practices and Quality Teacher Education). Pearson's product-moment correlation analysis was therefore used to test hypothesis one through hypothesis five. The independents t-test was also used to test the mean difference of TQM practices and quality teacher education between Federal and State owned tertiary institutions and between Universities and Colleges of Education in Lagos State as put forth in hypotheses six and seven.

3.8 Results

Tables 5 to 13 present the analysis of general information on the respondents.

TABLE 5 shows that out of the total respondents in the survey, 157 (20.2%) participants are from University of Lagos, 158 (20.3%) participants are from Lagos State University, 145 (18.6%) participants are from Federal College of Education (Technical) Akoka, 150 (19.3%) participants are from Micheal Otedola College of Primary Education, and 168 (21.6%) participants are from the Adeniran Ogunsanya College of Education, Oto-Ijankin. This findings shows that majority of the respondents are from University of Lagos, Lagos State University and Adeniran Ogunsanya College of Education, Oto-Ijankin.

TABLE 6. indicates that UNILAG had highest numbers of staff (21.4%) that participated in the study, followed by AOCOED (20.8%), LASU (20.1%), MOCOPED (20.0%), and FCET (17.2%). This implies that UNILAG has the highest number of staff participants in the study.

TABLE 7 indicates that academic staff formed the majority (240 or 66.7%) of the staff respondents while non-academic staff were only 120 (33.3%). This means that majority of the respondents in staff cadre are academic staff. This group of people also formed the main thrust of the research being directly involved in the activities of the study variables.

TABLE 8 shows public Colleges of Education in Lagos State as having the highest number of participants representing 59.5 per cent (463) while faculty of Education in Public Universities in Lagos State accounted for 40.5per cent (315). The implication of this data is that majority of participants were from Colleges of Education in Lagos State.

TABLE 9 indicates that fairly equal number of final year students were chosen as participants from the five selected public tertiary institutions in Lagos State except in AOCOED which constituted the highest number of sample students. This implies that the students were given fairly equal opportunity from the five public tertiary institutions in Lagos State to be represented in the study.

TABLE 10 illustrates the quality management term adopted by the institutions. The study considered the terms quality control, quality assurance, systems thinking, total quality management and lean six sigma. As indicated onTable 4.6, majority of the respondents (232 or 29.8%) identified with the adoption of total quality management while others identified with the adoption of lean six sigma (189 or 24%), system thinking (149 or 19.2%), quality control (132 or 17%) and quality assurance (78 or 10%) in that order of magnitude. The result indicates TQM as a major quality management term adopted by all the institutions.

TABLE 11 shows the level of importance attached to the identified quality management terms by the institutions. As indicated on TABLE 11, the respondents attached highest importance to quality assurance (23.3%) followed by quality control (22.2%), lean six sigma (20.7%), system thinking (18.4%), and then total quality management (15.4%). This is an indication that majority of the most important elements that the institutions consider in achieving quality teacher education are of quality assurance and quality control. The little emphasis on TQM is due to the poor awareness of TQM practices by the institutions.

TABLE 12 shows that the modal category of respondents was final year students with 47.9% followed by academic staff at almost 31%. The non-academic staff comprised 15.4%. Cumulatively, 5.8% were Vice Chancellors/Provosts, Dean of Faculties/Schools and Head of Departments. This variety of rankings may reflect on the various tasks involved in the job positions held by different categories of staff.

TABLE 13 indicates that majority (50.8%) of the respondents have SSCE since most of the respondents are students, followed by Master's degree holders at over 34% while Ph.D holders accounted for only 7.5%. Respondents who have a National Diploma and Bachelors degree equivalent were almost equal and relatively fewer, an indication that for one to teach or lecture in the University, one must have attained a Master's degree or a Ph.D. Cumulatively, almost 92.5% had a Master's degree and below, implying that most of the respondent academic staff are yet to attain the qualifications for teaching at the postgraduate level which is the degree of doctor of philosophy.

3.8 Descriptive Analysis on Total Quality Management Practices and Quality Teacher Education Dimensions

This section intended to reveal the responses of management and staff, and students about Total Quality Management and Quality Teachers Education in totality. TABLES 14 and 15 show the results of means of perception of the respondents. TABLE 14 shows the descriptive analysis of responses on quality teacher education in public tertiary institutions in Lagos State. The results indicate that there is no difference in the perceptions of management and staff, and students about quality teacher education. The mean response of management and staff range from 2.61 to 2.75 while mean response of students range from 2.51 to 2.73. The management and staff scored highest on quality lecturers (*mean=2.75*) while the students scored highest on Quality Supervision and Support (*mean = 2.73*). The results imply that the respondents mostly emphasized on quality lecturers, and Quality Supervision and Support as most significant aspects of quality teacher education. Each of these dimensions has the highest average score of 2.73.

TABLE 15 shows the descriptive analysis of responses on Total Quality Management Practices in public tertiary institutions in Lagos State. The results show a difference in the opinion of management and staff, and students about Total Quality Management Practices. In TABLE 15, the mean response for management and staff is 3.27 while mean response for student is 3.01. The results in TABLE 15 further reveals that, the management and staff scored highest in education and training (*mean=3.44*) while the students scored highest in System and Process of the Institution Operation (*mean = 3.27*). The results indicate that the respondents considered education and training as well as System and Process of the Institution Operation as most emphasized elements of TQM practices by the tertiary institutions. The less emphasized elements of TQM by management and staff are continuous improvement and management of leadership. This is in contrary to the general view about TQM which placed the highest emphasis on management of leadership among other elements.

3.9 Correlation Analysis

Correlation analysis is a measure of the strength or degree of the linear relationship between two or more variables. The correlation analysis provides important implications for examining the relationships between dependent variable (quality teacher education) and independent variable (Total Quality Management Practices). One way of interpreting the strength of correlation coefficient is by using the following "Rules of Thumb" applied to the absolute value of calculated measure as shown in TABLE 16. The correlation matrix describing these correlations for the study variables and their dimensions are presented in Table 17.

TABLE 17 shows the Pearson's product-moment correlation matrix indicating the correlations between TQM Practices and quality teacher education dimensions. TABLE 17 shows that almost all variables are positively correlated to one another at 0.05 level of significance. The table reveals that management of leadership has weak but significant correlation with dimensions of quality teacher education namely quality learners (*r=.212; p<0.05*); quality learning environment (*r=.246; p<0.05*); quality content (*r=.254; p<0.05*); quality process (*r=.278; p<0.05*); quality lecturers (*r=.198*; *p<0.05*); and quality supervision and support (*r=.243*; *p<0.05*). Continuous improvement also has a significant positive correlation with the dimensions of quality teacher education. It has a significant but weak relationship with quality learners (*r=.172; p<0.05*); quality learning environment (*r=.181; p<0.05*); quality content (*r=.199; p<0.05*); quality process (*r=.226*; *p<0.05*); quality lecturers (r=.137 *p<0.05*); and quality supervision and support (*r=.172; p<0.05*). From Table 4.16 it is evident that resource and infrastructural management has a weak but significant positive correlation with the dimensions of quality teacher education: quality learners (*r=.238; p<0.05*); quality learning environment (*r=.317; p<0.05*); quality content (*r=.322; p<0.05*); quality process (*r.361; p<0.05*); quality lecturers (r=.298; *p<0.05*); quality supervision and support (*r=.291*; *p<0.05*).

Work environment and culture also correlates with some dimensions of quality teacher education. It has a significant but weak positive relationship with quality learners (*r=.159; p<0.05*); quality process (*r=.164; p<0.05*); quality lecturers (*r=.131; p<0.05*); quality supervision and support (*r=.136; p<0.05*). The results of the analysis as shown in TABLE 17 demonstrate a weak but positive significant correlation between TQM practices and quality teacher education. The significant correlation between TQM practices and quality teacher education confirms the underlying basis of this study that there is a significant relationship between Total Quality Management Practices and quality teacher education in public tertiary institutions in Lagos State. It mean that as the implementation of TQM increase so will quality teacher education increase.

3.10 Testing of Research Hypotheses

Hypothesis One

This hypothesis states that there is no significant relationship between Total Quality Management Practices and quality teacher education in public tertiary institutions in Lagos State. To test this hypothesis, data collected on Total Quality Management Practices and quality teacher education in public tertiary institutions were subjected to Pearson's product-moment correlation analysis. Data were obtained by pooling the responses collected from the dimensions ofTotal Quality Management and quality teacher education in public tertiary institutions.The results are presented in TABLE 18.

The result of the test performed indicates that there is a substantial, significant and positive relationship between Total Quality Management Practices and quality teacher education in public tertiary institutions in Lagos State *(r = 0.695; p<0.05).* This implies that the null hypothesis one which states that there is no significant relationship between Total Quality Management Practices and Quality Teacher Education in public tertiary institutions in Lagos State is rejected. The implication of this is that, Total Quality Management Practices have a significant influence on quality teacher education in public tertiary institutions in Lagos State.

Hypothesis Two

This hypothesis states that there is no significant relationship between Total Quality Management Practices and Quality Teacher Education in public colleges of education in Lagos State. The data employed were obtained by pooling the responses collected from the dimensions of Total Quality Management Practices and Quality Teacher Education in public colleges of education in Lagos State. To test this hypothesis, data collected were subjected to Pearson's product-moment correlation analysis. The results are presented in TABLE 19. It is shown in TABLE 19 that there is a low significant positive relationship between Total Quality Management Practices and quality teacher education in public colleges of education in Lagos State *(r=.315; p<0.05).* Hence, TQM Practices have an influence on quality teacher education in public colleges of education. Therefore, the null hypothesis two is rejected. The implication is that, TQM practices have an influence on the quality teacher education in public colleges of education in Lagos State.

Hypothesis Three

This hypothesis states that there is no significant relationship between Total Quality Management Practices and quality teacher education in public universities in Lagos State. To test this hypothesis, data collected on Total Quality Management Practices and quality teacher education in public universities were subjected to Pearson's product-moment correlation analysis. The data were obtained by pooling the responses collected from the dimensions of Total Quality Management and quality teacher education in public universities only. The results are presented in TABLE 20.The result of the test performed shows that there is a weak but significant, positive relationship between Total Quality Management Practices and Quality Teacher Education in public universities in Lagos State *(r = .245; p<0.05).* Therefore, the null hypothesis three which states that there is no significant relationship between Total Quality Management Practices and Quality Teacher Education in public universities in Lagos State is also rejected. Hence, Total Quality Management Practices have significant influence on quality teacher education in public universities in Lagos State.

Hypothesis Four

This hypothesis states that there is no significant relationship between Total Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions in Lagos State. To test this hypothesis, data collected on the Total Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions were subjected to Pearson's product-moment correlation analysis. The data were obtained by pooling the responses collected from the dimensions ofTotal Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions. The results are presented in Table 21. The correlation coefficient between Total Quality Management Practices and Quality Teacher Education is 0.352 which is significant at 0.05 level *(r=.352; p<0.05).* This implies that there is a low significant positive relationship between Total Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions in Lagos State. Therefore, hypothesis four which states that there is no significant relationship between Total Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions in Lagos State was rejected. Hence, Total Quality Management Practices have an influence on quality teacher education in Federal Government owned tertiary institutions in Lagos State.

IV. FIGURES AND TABLES

Table 1: Characteristics of different stages in Total Quality Management

Stage	Characteristics

QI (1910s) Quality Inspection	Salvage; Sorting; Corrective action; Identify sources of non-conformance
QC (1924s) Quality Control	Quality manual; Performance data; Self-inspection; Product testing; Quality planning; Use of statistics; Paperwork control
QA (1950s) Quality Assurance	Third-party approvals; Systems audits; Quality planning; Quality manuals; Quality costs; Process control; Failure mode and effect analysis (FMEA); Non-production operation
TQM (1980s) Total Quality Management	Focused vision; Continuous improvements; Internal customer; Performance measure; Prevention; Company-wide application; Inter-departmental barriers; Management leadership

Source: [28].

Table 2: Stages in Improving and Managing Quality

Stage	**Characteristics**
Pre – 1900	***Quality as in integral element of craftsmanship***
1900 – 1920	***Quality Control by Foremen***
1920 – 1940	***Inspection-based Quality Control***
1940 – 1960	***Statistical Process Control***
1960 – 1980	***Quality Assurance and Total Quality Control***
1980 – 1990	***Total Quality Management (TQM)***
1990 – 2000	***TQM and the culture of continuous improvement***
2000 – present	***Organization-wide Quality Management***

Source: http://content.authorstream.com/ppt/157007_633714122495836250.pptx

Table 3: The distribution of sample.

	UNILAG	LASU	MOCOPED	AOCOED	FCET
No of Department	***5***	***5***	***5***	***5***	***4***
Vice Chancellor /Provost	1	1	1	1	1
Dean of Faculty/Schools	1	1	5	5	4
Head of Department	5	5	5	5	4
Academic Staff	50	50	50	50	40
Non-academic staff	25	25	25	25	20
Final Year Students	100	100	100	100	100
Sum	182	182	186	186	169

	Sum Total: **905**

Source: Field Survey, 2013.

Table 4: Dependent and Independent variable

Instrument	**Variables**	**Indicators**
Dependent Measures		
Quality Teacher Education Questionnaire	Quality teacher education	Quality learners
		Quality learning environment
		Quality content
		Quality process
		Quality lecturers
		Quality supervision and support
Independent Measures		
Total Quality Management Questionnaire	Quality teacher education	Management of leadership
		Measurement and feedback
		Continuous improvement
		Resource and infrastructural management
		Work environment and culture
		Education and training
		Process of the institution operation

Source: Developed by the Researcher for the study, 2014

Table 5.: Sample Number by Institutions

Name of Institution		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNILAG	157	20.2	20.2	20.2
	LASU	158	20.3	20.3	40.5
	FCET	145	18.6	18.6	59.1
	MOCOPED	150	19.3	19.3	78.4
	AOCOED	168	21.6	21.6	100.0
	Total	778	100.0	100.0	

Table 6: Sample Number of Staff by Institutions

Name of Institution		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNILAG	77	9.9	21.4	21.4
	LASU	74	9.5	20.1	41.5
	FCET	62	8.0	17.2	58.7
	MOCOPED	72	9.3	20.0	78.7

	AOCOED	75	9.6	20.8	100.0
	Total	360	46.3	100.0	
Missing	System	418	53.7		
Total		778	100.0		

Table 7: Sample Number of Academic and Non-Academic staff

Number of Staff		Frequency	Percent	Valid Percent	Cumulative Percent
	Academic Staff	240	30.8	66.7	66.7
Valid	Non-Academic Staff	120	15.4	33.3	100.0
	Total	360	46.3	100.0	
Missing	System	418	53.7		
Total		778	100.0		

Table 8: SampleNature by faculties and colleges of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Faculty of Education in Public Universities in Lagos State	315	40.5	40.5	40.5
	Public Colleges of Education in Lagos State	463	59.5	59.5	100.0
	Total	778	100.0	100.0	

Table 9: Sample Number of Final Year students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNILAG	72	9.3	19.3	19.3
	LASU	74	9.5	19.8	39.1
	FCET	76	9.8	20.4	59.5
	MOCOPED	71	9.1	19.0	78.5
	AOCOED	80	10.3	21.4	100.0
	Total	373	47.9	100.0	
Missing	System	405	52.1		
Total		778	100.0		

Table 10: Quality Management Terms' Adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Quality Control	132	17.0	17.0	17.0
	Quality Assurance	78	10.0	10.0	27.0
	Total Quality Management	232	29.8	29.8	56.8
	System Thinking	149	19.2	19.2	76.0
	Lean Six Sigma	187	24.0	24.0	100.0
	Total	778	100.0	100.0	

Table 11: Quality Management Terms' Importance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Quality Control	173	22.2	22.2	22.2
	Quality Assurance	181	23.3	23.3	45.5
	Total Quality Management	120	15.4	15.4	60.9
	System Thinking	143	18.4	18.4	79.3
	Lean Six Sigma	161	20.7	20.7	100.0
	Total	778	100.0	100.0	

Table 12: Sample Academic Cadre

Sample Cadre		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vice Chancellor/Provost	5	0.6	0.6	.6
	Dean of Faculty/Schools	16	2.1	2.1	2.7
	Head of Department	24	3.1	3.1	5.8
	Academic Staff	240	30.8	30.8	36.6
	Non-academic staff	120	15.4	15.4	52.0
	Final Year Students	373	47.9	47.9	100.0
	Total	778	100.0	100.0	

Table 13:Sample Academic Qualification

Highest Academic Qualification		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WASC/SSCE	395	50.8	50.8	50.8
	OND	27	3.5	3.5	54.2
	NCE	8	1.0	1.0	55.3
	BSc/HND	24	3.1	3.1	58.4
	Master's Degree	266	34.2	34.2	92.5
	Ph.D	58	7.5	7.5	100.0
	Total	778	100.0	100.0	

Table 14. Descriptive Analysis on Quality Teachers Education

QTE	QL	QLE	QC	QP	QLEC	QSP	Average
Management & Staff	2.63	2.65	2.62	2.61	2.75	2.73	2.67
Students	2.51	2.68	2.72	2.71	2.71	2.73	2.67
Average	2.57	2.67	2.67	2.66	2.73	2.73	2.67

NB: QL - Quality Learners, QLE - Quality Learning Environment, QC- Quality Content, QP- Quality Process, QLEC- Quality Lecturers, QSS -Quality, Supervision and Support

Table 15: Descriptive Analysis of Total Quality Management Practices

QTE	ML	M&F	CI	RIM	WEC	E&T	SPIO	Average

Management & Staff	3.17	3.31	3.07	3.22	3.23	3.44	3.43	3.27
Students	2.98	2.91	2.99	3.05	3.03	2.99	3.11	3.01
Average	3.08	3.11	3.03	3.14	3.13	3.22	3.27	3.14

NB: MOL-Management of Leadership, MAF-Measurement and Feedback, CI-Continuous Improvement, RIM-Resource and Infrastructural Management, WEC-Work Environment and Culture, ET-Education and Training, SPIO-System and Process of the Institution Operation

Table 16: Rules of the Thumb about Correlation Coefficient Size

RANGE	INTERPRETATION
0<r<0.2	No or negligible correlation
0.2<r<0.4	Low degree of correlation
0.4<r<0.6	Moderate degree of correlation
0.6<r<0.8	Marked degree of correlation
0.8<r<1	High correlation

Source: Adapted from [29] in computational finance: Finance training course.

Table 17: Correlation Matrix for Quality Teacher Education and Total Quality Management Practices

	QL	QLE	QC	QP	QLEC	QSS	MOL	MAF	CI	RIM	W
QL	1										
QLE	.717**	1									
QC	.687**	.911**	1								
QP	.706**	.896**	.898**	1							
QLEC	.695**	.824**	.797**	.828**	1						
QSS	.716**	.849**	.809**	.821**	.841**	1					
MOL	.212**	.246**	.254**	.278**	.198**	.243**	1				
MAF	.062	.081	.096	.115	.059	.108	.926**	1			
CI	.172**	.181**	.199**	.226**	.137**	.172**	.935**	.959**	1		
RIM	.238**	.317**	.322**	.361**	.298**	.291**	.912**	.945**	.943**	1	
WEC	.159**	.108	.127	.164**	.131**	.136**	.954**	.938**	.951**	.920**	
ET	.042	.028	.101	.110	.002	.034	.944**	.939**	.963**	.922**	.96
SPIO	.066	.076	.089	.125	.056	.074	.935**	.948**	.959**	.926**	.95

**p<0.05 (2-tail test)

QL - Quality Learners
QLE - Quality Learning Environment
QC- Quality Content
QP- Quality Process
QLEC- Quality Lecturers
QSS - Quality Supervision and Support
MOL- Management of Leadership
MAF- Measurement and Feedback
CI- Continuous Improvement
RIM- Resource and Infrastructural Management
WEC- Work Environment and Culture
ET- Education and Training
SPIO- System and Process of the Institution Operation

Table 18: Pearson's Product-moment Correlation Analysis of Total Quality ManagementPractices and quality teacher education of public tertiary institutions in Lagos State

Variables	N	Mean	Std. Dev.	R	Sig.	Decision
Total Quality Management Practices	778	79.23	11.050	.695*	.000	Reject
Quality Teacher Education	778	70.67	13.362			

* Correlation coefficient is significant at 0.05 level.

Table 19: Pearson Product moment Correlation Analysis of Total Quality Management Practices and Quality Teacher Education in public colleges of education in Lagos State

Variables	N	Mean	Std. Dev.	R	Sig.	Decision
Total Quality Management	463	73.93	18.53	.315*	.004	Reject
Quality Teacher Education	463	47.64	12.21			

* Correlation coefficient is significant at 0.05 level

Table 20: Pearson Product moment Correlation Analysis of Total Quality Management Practices and quality teacher education in public universities in Lagos State

Variables	N	Mean	Std. Dev.	R	Sig.	Decision
Total Quality Management	315	248.02	16.940	.245	.011	Reject
Quality Teacher Education	315	371.98	51.674			

* Correlation coefficient is significant at 0.05 level

Table 21: Pearson's Product-moment Correlation Analysis of Total Quality Management Practices and Quality Teacher Education in Federal Government owned tertiary institutions

Variables	N	Mean	SD	R	Sig.	Decision
Total Quality Management	302	36.98	16.740	.352*	.022	Reject
Quality Teacher Education	302	24.71	10.514			

* Correlation coefficient is significant at 0.05 level

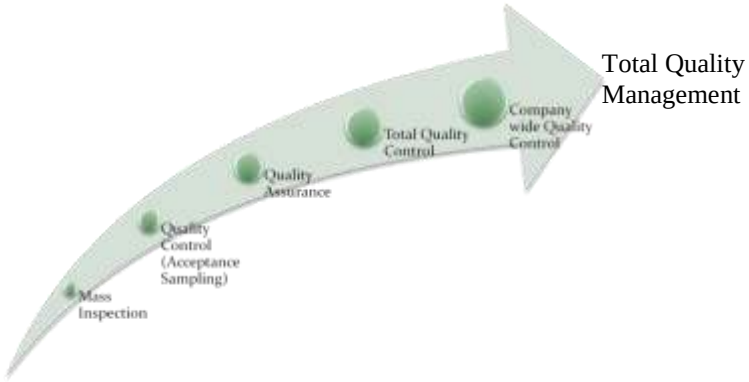

Fig 1.0: The hierarchy of Quality Concepts.
Source: http://content.authorstream.com/ppt/157007_633714122495836250.pptx

Total Quality Management

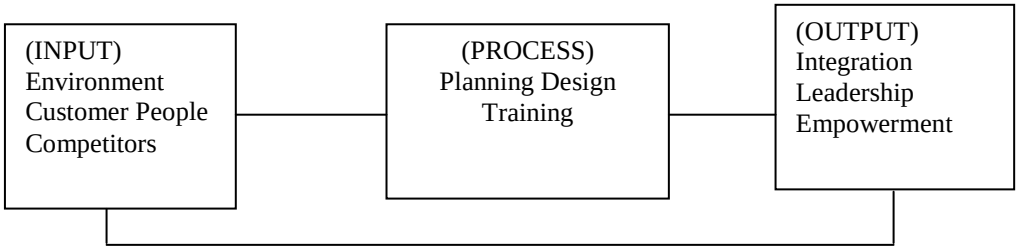

Fig 2.0: Total Quality Management System

Source: [30].

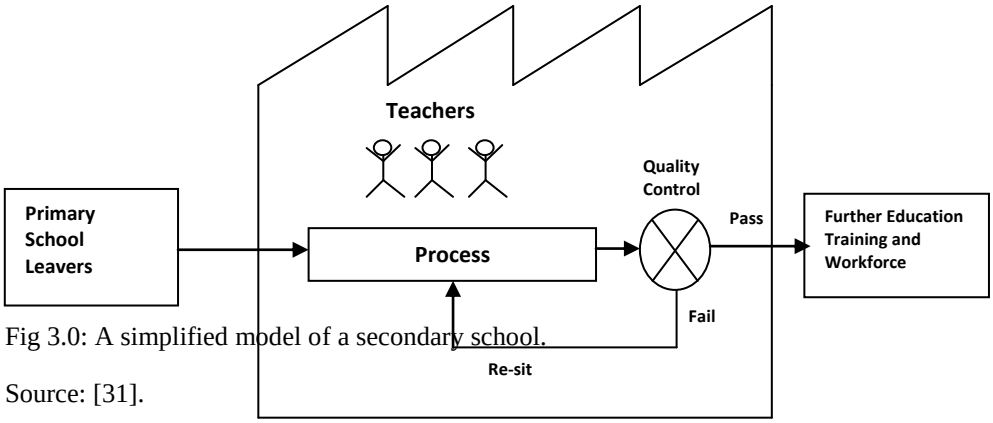

Fig 3.0: A simplified model of a secondary school.

Source: [31].

V. CONCLUSION

The research showed significant relationship between TQM practices and quality teacher education. With the abundant researches that had been carried out by many researchers on Nigeria universities and colleges of education (especially on state and federal government owned), the problems are found to oscillate between

management and resources; either wrong management and right resources or right management without resources or wrong management and wrong resources. The main components of TQM as drawn from the Deming's fourteen points focus on exactly the same areas of problem that have been raging the progress of the public tertiary institutions in Lagos state (specifically) and Nigeria (in general). TQM main components comprise: Management and Leadership, Measurement and Feedback, Continuous Improvement, Resource and Infrastructural management, Work Environment and Culture, Education and Training, System and Process of the Institution 'operation'.

Though the purpose of the study was to find out the extent to which quality teacher education correlates with Total Quality Management Practices, the study also found the importance and relevance of the components of Total Quality Management in providing quality to the teacher education. Eight research questions and seven research Hypotheses were formulated to cover the scope of the study. The significance of this study was to provide the government, parents, teachers, work force, the students and other stakeholders of education system an insight and understanding into the reasons for Total Quality Management to be the norm in the delivery of all education system services especially teacher education in tertiary institutions.

The reliability of the instrument using Cronbach Alpah's coefficient test was computed to be 0.838 for quality teacher education and 0.879 for total quality management Practices which connotes high reliability or consistency. The study also presented data and result analysis. It analyzed data on quality teacher education and Total Quality Management Practices. It correlated these two variables across the public tertiary institutions in Lagos state as demanded by the research questions and research hypotheses. The result shows that there is a significant, positive relationship between Total Quality Management Practices and quality teacher education in public tertiary institutions in Lagos State *($r= 0.695; p<0.05$).*

The Lagos state public tertiary institutions are very much aware of quality control and quality assurance as well as of TQM. As quality control and quality assurance focus on removing defective products (which are to be returned to the system), TQM sees these as wastes of resources and focuses on the process to produce defect-free products. Thus the Lagos State public tertiary institutions put TQM into practice to an appreciable extent in order to achieve Quality Teacher Education.

The results of the research show that an effective quality management is required to be put in place in all the public tertiary institutions in Lagos state. The limitation of quality assurance and control which are provided in Total Quality Management makes TQM the most effective quality management philosophy that can yield positive result. The TQM framework explains the procedure of implementation and the empirical findings including those in this study indicated the effectiveness of TQM in academic institutions where it had been used. The results also conclusively show that proprietorship and status of institutions are factors that impinge upon TQM as the latter affects Quality Teacher Education.

Based on the findings in this study, the following recommendations are made:

1. Total Quality Management is highly recommended to be practised in full capacity in all of the public tertiary institutions in Lagos state (and in all other tertiary institutions in Nigeria as a whole) with full support both financially and man-power wise from the Federal and State governments of the federation. However, TQM should be adquately implementated in tertiary institutions without bias for status or nomenclature.
2. Behavioural studies on students at fresh, middle and at final levels should be considered. This will enable disclosure of factors that force changes in students who were determined to be learners initially but lost focus on the way. In education, lecturers and students are the key; both together formed the definition for learning. Proper research should be put in place to study the behaviours of students in relation to their progress over time. The aim of Total Quality Management is to produce zero-defect graduates, in other words, those students who pass must pass excellently and competently.

This research and its findings have made modest contributions to knowledge in the area of the application of total quality management to quality teacher education. It has modestly extended the frontiers of knowledge in the following areas:

i. There is a relationship between TQM Practices and quality teacher education in public tertiary institutions in Lagos State, Nigeria.
ii. There is a difference in the attention given to institutions between Federal and State government owned tertiary institutions as well as between Colleges of Education and Universities. Therefore, status and ownership are factors in management practices among institutions.

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