QUALITY OF ACADEMIC CURRICULUM AND EMPLOYABILITY SKILLS AMONG UNIVERSITY SCIENCE GRADUATES IN THE SOUTH-WEST, NIGERIA

BY

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CERTIFICATION

I certify that this research work was carried out by **Olukemi Omolola OGUNNIRAN (**Matric.No.:54192) in the Department of Educational Management, Faculty of Education, University of Ibadan, Nigeria under my supervision.

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DEDICATION

This research work is dedicated to the Almighty God, who has made this desire of my heart a reality. May His Name be praised now and forever. I also dedicate it to my children, Temidayo, Temilayo and Temitayo Adelakin, for their unending love, encouragement and sacrifices.

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LIST OF ACRONYMS

NUC   National Universities Commission

NUCBMAS   National Universities Commission Benchmark for Minimum Academic Standard

NBS   National Bureau of Statistics

UNESCO   United Nations Educational Scientific and Cultural Organization

UTME   Unified Tertiary Matriculation Examination

QAC   Quality of Academic Curriculum

IR   Instructional Resources

IS   Instructional Materials

PF   Physical Facilities

HR   Human Resources

MT   Methods of Teaching

AS   Assessment Strategies

ES   Employability Skills

SIWES   Student Industrial Work Experience Scheme

FRN   Federal Republic of Nigeria

BMAS   Benchmark for Minimum Academic Standards

ABSTRACT

Employability entails a set of achievements to secure a job, while Employability Skills (ES) are innate potentials needed to function in a work place. Employability Skills (leadership, teamwork, oral communication, interpersonal and initiative) have been reported to be poor among university graduates. Previous studies on ES considered skills mismatch, assessment, impacting factors, career guidance but gave little attention to quality of academic curriculum (Instructional Materials – IM, Physical Facilities – PF, Human Resources – HR, Methods of Teaching – MT, and Assessment Strategies – AS). This study, therefore, was carried out to investigate the relationships between IM, PF, HR, MT and AS with ES among science graduates of universities in the South-West, Nigeria.

The study was anchored to Quality Enhancement Model, while the mixed-method design was employed. The multi-stage sampling procedure was adopted. The universities in the south-west, Nigeria were stratified based on ownership (federal, state and private). Seven universities were randomly selected from the strata – Federal (University of Ibadan, Ibadan), State (Adekunle Ajasin University, Akungba, Ekiti State University, Ado-Ekiti and Osun State University, Osogbo) and Private (Adeleke University, Ede, Caleb University, Imota and Wesley University, Ondo). All final year science students totaling 1259 and their lecturers (284) were enumerated. Employers of labour were randomly selected for the following sectors: Manufacturing and Construction (6), Agricultural and Forestry (3), Telecommunication (6), Health (3), Banking and Finance (5), Education (6) and Judiciary (6). The instruments used were Quality Academic Curriculum and Employability Skills Questionnaire for Lecturers (r=0.98), Students (r=0.80) and Employers (r=0.76). Key Informant Interviews were conducted with four employers of labour. Quantitative data were analysed using descriptive statistics, Pearson's product moment correlation, Multiple regression and t-test at 0.05 level of significance, while qualitative data were analysed thematically.

The participants' age was 23.0 ± 2.30 years, while 59.0% were males. Leadership ($\bar{x}$=3.36), self-confidence ($\bar{x}$=3.23), initiative ($\bar{x}$=3.15), interpersonal ($\bar{x}$=3.19), independence ($\bar{x}$=3.17) were high against the threshold of 2.50. Teamwork ($\bar{x}$=3.05) and information technology ($\bar{x}$=3.00) skills were fairly acquired, while instructional resources ($\bar{x}$=2.55) were fairly adequate. There were significant relationships between IM (r = 0.59), PF (r=0.68), HR (r=0.70), MT (r =0.54), AS (r = 0.70) and ES. The independent variables made a significant contribution to ES (Adj. R^2=0.72) $F_{(5,269)}$ =118.30, accounted for 72.0% of its variance. The IM (β=0.20), PF (β=0.21), HR (β=0.03) and MT (β=0.50) made relative contributions to ES, while AS did not. Significant difference existed between skills acquired by students in public and private universities (t_{1257}=2.05). The students from private universities ($\bar{x}$=66.61) acquired more skills than their counterparts in public universities ($\bar{x}$=57.13). Employers of labour embraced all the employability skills required for organisational enhancement.

Quality of academic curriculum influenced the employability skills among university science students in the South-West, Nigeria. Instructional resources and methods of teaching should be improved, while assessment strategies should be reviewed to enhance graduate employability skills.

Keywords: Academic curriculum, Assessment strategies, Employability skills, Science graduates in Southwestern Nigeria

Word count: 464

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INTRODUCTION

1.1   Background to the Study

Employability is a relatively new term not used in many developing countries, and has since remained a subject of immense debate and considerable concern, particularly in Nigeria. Every institution of learning is faced with the task of promoting the development of employability skills to make their graduates more acceptable to employers. Employers of labour expected that graduates would have the skills that would give them the expected kind of jobs in the labour market. Since employability had come to play a vital role among university graduates, institutions are now looking for ways to improve ongraduates' employability status. This development is as a result of the request from the employers of labour.

Meanwhile, it seems some employers only place less value on the certificates obtained by graduates than the actual practical experiences gained. In other words, the experience of graduates is seen as not having the same importance as the knowledge acquired through the course of study. Labour market and employer's requirements for graduates in terms of employability skills vary from one job to another. As the economy and business environment change, so also the skills and the hands-on experiences required by the employers of labour vary. Therefore, it becomes necessary for potential employees to flow with the trend in the work settings in which employability skills play a significant role. However, employers assumed that graduates are more academically oriented but found that there is a challenge when it comes to the demostration of some skills.

Considering the benchmark used in determining the quality of tertiary education, it appears that candidates' employability prospect is one of the major indicators used by employers of labour. Other determinants employed in measuring the quality of tertiary education included graduation and retention rates, highest level of education attained by students in ten (10) years after they first enrolled, transfer rates, preparation for careers,

job placement as well as research and development activities (National Centre for Public Policy and Higher Education, 2008). Hence, employability status of University graduates is fast becoming relevant in higher education programmes and strategies (YuzHuocai and Yulia, 2011). Employability relates to the issue of how prospective employees go through the processes of acquiring the skills necessary to find and thrive on the job. Similarly, employability is when one is considered to possess skills required to find a job, stay on the job or obtaining new employment when needed (Crossman and Clarke, 2010). It is, therefore, evident that the partnership between universities and enterprises remain essential for enhancing graduates' employability, since the main objective of universities is to produce qualified, skilled, globally competitive and locally responsive workforce for the labour market.

Accordingly, to be employed connotes securing a job and being employable means possessing pre-requisite attributes required to keep employment and advance in the workplace. Thus, employability cannot be equated with employment. Employment is a state whereby a person willing and able to work, can find a paid job or work (Pitan, 2011) whereas employability is the actual skills acquired by the students to be relevant in the world of work (Adedeji and Oyebade, 2016). Ananga (2015) on university education, employability and skill gap in Ghana stated that, employability entails producing an individual that is highly skilled, knowledgeable with a practical and intellectual way of thinking and ability to solve problems within the immediate communities. Similarly, McCowan (2014) on higher education and job crisis in Africa described employability as being in control of relevant knowledge, skills and other attributes for winning and retaining a gainful employment.

In addition, considering the increasing rate of unemployment amongNigerian university graduates, the National Bureau of Statistics (NBS, 2017) compared data from July, 2016 to July, 2017, when the unemployment rate surged from 13.3 per cent to 18.2 per cent. Therefore, there is need for an enhanced employability skills development, which is a concern to stakeholders. Despite an increase in the establishment of tertiary institutions in the country, there is no corresponding development of skills and thereby no decrease in the rate of unemployment. For instance, the establishment of universities in the last thirteen years, raised from 90 approved universities in 2008 to 197 universities in

2021 (National Universities Commission, 2021). The United Nations Educational Scientific and Cultural Organisation (UNESCO, 2018) stated that, as the rate of transformation in the education sector gets higher, the growth rate of economies and labour markets remain the same or even becomes lower. Griffin (2012) also agreed to the fact that, employability skills such as communication (oral and written), teamwork as well as decision-making are lacking among prospective employees. Therefore, the trend at whichunemployment becomes popular with graduates, created the need in encouraging the acquisition of transferable skills.

Furthermore, NBS (2016), stated that,as the economic life of individuals continue to nosedive, the population of those who are qualified and willing to work but could not get any job to do, rose to 22.45 million in the fourth quarter of the previous year compared with the third quarter of the same year having 20.7m representing 9.1 per cent increase. The employment crisis in Nigeria degenerated in2016 to 12.1 per cent while NBS unemployment watch report of 2015- 2016 (December- March) showed that individuals ready to work and qualified to do so, but had no job, were more than 1.45 million from the initial 518,000(NBS, 2016). It also showedthe laxity and lackadaisicalattitude on the part of the government in keeping up with the promise of creating more jobs by the end of 2015 in order not to allow unemployment rate to exceed 10.4 percent. To this end, the crisis of not being able to secure jobs really got worse. In the same vein, Longe (2017) reported more than five million of the 10 million graduates released to the labour market every year from more than 700 universities specifically in Africa, could not find jobs they were qualifiedly trained to do. This is attributed to skills mismatch, inadequate practical training, inadequate industrial hands-on experience and erroneousselections of professions.

Notably, employers of labour now find it difficult to give out jobs that are available even to graduates who come out with first class degrees. This is because it appears these university graduates do not have the skills required by the would-be employers when tested for job suitability (Pitan, 2011). In NBS (2016) report, a total of 52 million citizens within the active population did not have jobs and this statistics included the newly-qualified university graduates in all disciplines in 2016.

Employability skills play major roles in determining the 'career-ability' of university graduates (Varwandkar and Deshmukh, 2012). The potential of having employability skills is a necessity for every graduate intending to be part of the labour force. Adedeji (2014) stated that, due to the changes in the global trend at workplace, there was need for a change of skills requirement. This was due to the fact that, there had been a development of new technologies being adopted in industries. The new technologies had given rise to a new phase of development and, thereby, brought about the necessity for restructuring of work itself. This can be regarded as giving way for new proficiencies among the students in order to be employable. On the other hand, Kinash, Crane, Judd, Mitchell, Mclean, Knight and Dowling (2015) emphasised that, in order to be employable, students must extend themselves, by acquiring broad and full experience which is a higher education degree.

Traditionally, skills could be classified into two types: transferable and technical skills. The transferable/generic skillsare abilities and expertise that are relevant and helpful across different spheres of life. These include leadership, interpersonal, problem-solving, presentation, analytical, communication, information technology, decision-making, critical thinking, creativity, team work, adaptability, self-confidence, independence and initiative, which can be used across diverse occupations. Technical abilities on the contrary,are specifics and required within an organisation only, to perform well. This research focused mainly on transferable skills needed across occupations by employers. The employability skills are targeted through behavioural attributes and learning outcomes that are pertinent for the students in the sustainability of jobs in work place as well as their careers in life. Furthermore, ability to demonstrate these skills when acquired is also very important.In this respect, Ivey (2002) noted that, lack of up-to-date skills tends to be a menace for current and future jobs prospect.

In addition, academic curriculum encompasses all formal courses that students can undertake to earn their Bachelor's degree (Westminster School, 2017). Academic curriculum can also include graduation requirements in terms of number of units of courses that a student must have completed. In this study, courses in the science-based discipline (pure and applied) were considered. The academic curricula content is drawn on the basis of problems, themes, topics and lessons to be taught which cut across

traditional subjects in the hope of achieving some kind of unity (Nicholas, 2006) in a specific course of programme. Considering what a student is supposed to be taught and the expected learning outcomes can be regarded as the curriculum. These include the objectives of the instructions to be given, the lessons' contents to be taught, homework to be assigned, print and non-printed materials to be used for teaching and learning, quizzes to be administered and appraisal processes and procedures for students (The Glossary of Education Reform, 2015). Content is very closely related to methods. The methods used often have as much influence on what the students learn as does the content itself.

As a result of focusing on the science-based potential graduates, there is the need to briefly discuss what science discipline is and the inputs as well as process as it relates to academic curriculum. The field of science is a basis for every scientific progression which had played significant roles in human lives.When it comes to the teaching of science, it must be detailed with the students having the assurance that getting a job after graduating from school will not be difficult. Also, the atmosphere under which learning takes place must give room for the students to be creative, innovative as well as independent (NUCBMAS, 2015).

Science is an organised body of knowledge and it differs from other disciplines having well-known procedures for obtaining knowledge in both content and form. It involves processes whereby after establishing the body of knowledge, it can continually be refined, revised and extended. The two branches of science are empirical and formal sciences. Formal sciences include but not limited to mathematics-geometry-algebra and trigonometry, logic, theoretical physics and statistics while empirical sciences are applied sciences, based on experience and testable observations which entail both the physical and biological sciences (Adeleke University Directorate of General Education, 2020). Science curriculum on the other hand, has to do with different course areas and contents in the various universities in the science disciplines. These disciplines involve only the pure and applied sciences.

Science-based disciplines are not the most-sought-for courses in Nigerian universities because majority of the post-primary students prefer courses from Arts and Humanities. From preliminary investigations,this can be attributed to the

students'perception of science-related courses being difficult to pass and if not intelligent enough, one cannot be in science class. Among the top 10 most-preferred courses by applicants, Humanities topped the list with 42% having Mass Communication and Journalism as number one followed by Public Administration. The second of the top 10 was engineering with 14% of applicants seeking admissions while Computer Science barely made 7% (NBS, 2009). Despite the 60-40 government policy through the National Universities Commission on the admissions, staffing and resources to science-based discipline, admission appeared not to be encouraging. This can be viewed from the results of the Unified Tertiary Matriculation Examination (UTME) from 2011 – 2015. In 2011, only 23,771 applicants passed; in 2012, the number rose to 28,007 while in 2013, it was 31,055 applicants compared to 2014 and 2015 which are 32,293 and 32,791 respectively (Joint Admission Matriculation Board, 2016). The results from the UTME can be compared with number of applicants from 2012-2014 in which in 2012, the population was 48,211 while in 2013, the figure rose to 52,111 and eventually dropped to 49,184 in 2014. However, it becomes imperative to account for the 60-40 government policy on science-based disciplines since they are not among the top ten disciplines sought for by students. Therefore, there is the need for justification in terms of acquiring transferable abilities by students.

In science-based disciplines, the quality of curriculum determines the quality of skills given to the potential graduates in that field. Garvin (1998) sees and described quality in terms of academic curriculum as determined by coherence, relevance, rigour, current duration and flexibility. The content must be coherent to integrate beliefs and values as well as the linkages among course descriptions, learning outcomes, teaching methodology as well as assessment strategies. The relevance of the curriculum is an evidence of stakeholders' involvement in educationoutput which shows the capabilities and substance the students are made up of. Also, pertaining to comprehensivenessofcourse content, its flexibility to reflect delivery options and diverse methods as well as the evidence of current knowledge, are qualities that must be considered in other to produce employable graduates. Okebukola (2017) equated the curriculum of Nigerian universities to what is now known as the Benchmark for Minimum Academic Standards (BMAS). The BMAS has the major elements of standard

curriculum, such as topics to be taught, required minimum human and material resources for curriculum delivery, taught pattern, method of examination and graduation requirements. In implementing quality academic curriculum, the NUC benchmark must be put into consideration, to serve as a guide.

On the other hand, inputs of academic curriculum designed to produce employable graduates must be clearly understood. The inputs include the students, course content, learning objectives, workload and teaching duration. In addition, the indicators of quality of academic curriculum include instructional resources (instructional materials, physical facilities, human resources), methods of teaching and assessment strategies. These indicators are assumed to be the part of processes through which the inputs must be refined to produce graduates with employability skills. Students as input play a major role in laying basic foundation for knowledge acquisition. A student that is deficient in a major subject might find it difficult to cope with school workload. Teachers on the other hand, are expected to plan for the lesson, mark students' work, assess the students, organised and run other school roles and responsibilities (National Education Union, 2018). The objectives of the instructions can be seen as comprising what must be taught and achieved by the time a course is completed.

Furthermore, the learning outcomes of these disciplines are: to cultivate the idea of good and highthinking capacities and knowledge; exhibition of high competencies and skills; and transferability of these abilities to solve societal problems (NUCBMAS, 2015). And lastly, the course content which includes the course information, objectives, grading information, instructor's contact, and textbooks. If these inputs are inadequate or deficient, no matter how laudable the processes in achieving employability skills are, there will be poor outcomes and vice versa.

It is essential to consider the academic curriculum delivery system in producing employable graduates because, it is during this process that the adequacy of physical facilities and instructional materials, human assets,methods to adopt in teaching as well as assessment strategies are technically requiredin the production of employable graduates. In addition, the teachers are considered to be the driving factor for academic curriculum delivery system, without which the materials, methods and assessment cannot be effective in producing graduates with employability skills. Materials (instructional

resources) are educational assets that boost learning in the classroom (Robb, 2019). They are educational materials that can be used by students to enhance learning which can be attended to or operated upon(Aseem, 2014). However, the University of California Faculty Resource Centre (2019) asserted that, instructional resources must be made available to make it easier for teachers and support staff to enhance teaching and learning processes.Instructional resources to be considered in this study are physical facilities (Space and Equipment), instructional materials (Printed and non-printed materials)and human resources (NUCBMAS, 2015).

In methods of teaching, academic curriculum with its four phases of planning, monitoring, review and implementation is critical to employability status of the students. Methods of teaching as one of the indicators of academic curriculum must be adequately planned, with a view that the best methods to teach the students are adopted. These include but not limited to Inquiry methods, oral presentation; open ended laboratory activities, and demonstration methods.

Assessment strategies on the other hand, a necessary part of learning processcan become meaningful if used correctly. This is used for students' assignment and it is higher than assigning grades alone. It also entails giving remarks on the score given to a student as well as having conversations with students being assessed when their grades are down. The grading systems in Nigerian universities include the formative and the summative assessments.The types are chosen according to what fits a particular situation. The grading system of private and public universities in Nigeria varies in terms of what percentage is allotted to what and what constitutes the grading system itself.

The nexus among the indicators of quality academic curriculum, which is the delivery system in producing employable graduates, cannot be over emphasized.If inputsin academic curriculum are adequate and laudable while the delivery system is inadequate, employability skills will not be acquired by the students. Also, if the inputs are inadequate but the delivery system is adequate, employability will not be acquired by the students. It is evident that the delivery system of a curriculum anchors the students' ability to acquire employability skills. Whenever best methods are adopted to teach the students, using the learning objectives as guidelines, adequate instructional materials must be made available.Assessment strategies applied in grading the students must be

appropriate for assigning the grades. With the delivery system adequately provided for, competencies and abilities will be gained, which in turn, will make them employable after graduating from school. In support of this, the United States Department of Education (USDE, 2016) stated that, knowledge and skills can be acquired through education as well as career development.

On the other hand, Adedeji and Oyebade (2015) in British Council Report on 'Graduate Employability in Nigeria: Thoughts, Travails and Tactics identified some causes of employability to include gender, ethnicity, family connection, social class, university status, highly deficient and out-dated and irrelevant curriculum. Other factors identified were teaching-learning processes which are traditional and not market-driven, insufficient capacity to enhance quality, low quality of teaching and poor study environment with incessant strikes as well as no visible policy on university-industry relationships.

1.2   Statement of the Problem

Employability of university graduates had become a subject of great concern in recent times. It has been observed that employability of university graduates in developing countries of the world, Nigeria inclusive, is very poor. Owing to some factors that include the pattern of teaching, adequacy of teaching materials, organisational culture, evaluation techniques, staff motivation, quality assurance, quality of pedagogies and co-curricular activities. These factors were considered without recourse to the link among Instructional resources (Instructional materials. physical facilities, human resources), methods of teaching, assessment strategies and employability skills. More often than not, quality of academic curriculum had been identified to play a critical role in enhancing graduate employability. A curriculum that is not standardised may likely lead to non acquisition of required employability skills for the potential graduates to secure employment with attendant results of financial and emotional instability. The implication of this is that, the potential graduates, may take to social vices such as robbery, fraudulent acts, kidnapping for ransom, terrorism, child and drug trafficking to survive among others.

Majority of the literature consulted indicated fewer empirical studies, specifically concerning quality of academic curriculum indicators in relation to employability skills

of potential graduates in the field of science in Nigeria. Previous attempts have focused on skills mismatch, skills assessment, skills' impacting factors, career guidance and employability skills among university graduates with less emphasis on how the integration of all the variables of quality of academic curriculum(instructional materials; physical facilities; human resources; methods of teaching; assessment strategies) interpreted employability skills.The development, therefore, brings about the need to establish the influence of quality academic curriculum on employability skills among potential graduates of universities in Nigeria. This study, therefore, investigated the relationship between quality of academic curriculum and employability skills among potential science graduates of universities in the South-West, Nigeria.

1.3   Purpose of the Study

The research work, objectively and in abroader term investigated the relationship between quality of academic curriculum (Instructional resources, methods of teaching, assessment strategies) and employability skills amongpotentialscience graduates of universitiesin the South-West, Nigeria. Specifically, the study:

i.   investigated the levels of employability skills acquired by potential science graduates in public and private universities in the South-West, Nigeria;

ii.   ascertained the types of employability skills required by employers of labour from university science graduates in the South-West, Nigeria;

iii.   established the quality of academic curriculum(instructional resources, methods of teaching, assessment strategies) of public and private universities in the South-West Nigeria;

iv.   examined the adequacy of Instructional resources (instructional materials, physical facilities, human resources) needed for implementation of science curriculum in public and private universities in the South-West, Nigeria;

v.   investigated the relationship between instructional materials and employability skills acquired by potential graduates of universities in the South-West, Nigeria;

vi.   ascertained the relationship between physical facilities and employability skills acquired by potential graduates of universities in the South-West, Nigeria;

vii.   examined the relationship between human resources and employability skills acquired by potential graduates of universities in the South-West, Nigeria;

viii.   investigated the relationship between methods of teaching science courses and employability skills acquired by potential graduates of universities in the South-West, Nigeria;

ix.   established the relationship between assessment strategies and employability skills acquired by potential graduates of universities in the South-West, Nigeria;

x.   examined the relative contributions of instructional materials, physical facilities, human resources, methods of teaching, and assessment strategies to employability skills acquisition of potential graduates of universities in the South- West, Nigeria;

xi.   investigated the joint relationship among instructional material, physical facilities, human resources, and methods of teaching, assessment strategies and employability skills of potential graduates of universities inthe South-West, Nigeria.

1.4   Research Questions

These research questions were raised and answers provided for in the study:

i.   What are the levels of employability skills acquired by the potential graduates of science in public and private universities in the South-West, Nigeria?

ii.   What are the types of employability skills required by employers of labour from potential graduates of universities in the South-West, Nigeria?

iii.   What is the quality of academic curriculum of public and private universities in the South-West, Nigeria?

iv.   How adequate are the instructional resources (instructional materials, physical facilities, human resources) needed for implementation of science curriculum to produce employable science graduates in public and private universities in the South-West, Nigerian?

1.5. Hypotheses

These hypotheses were formulated and tested in the study:

H_{o1} There is no significant relationship between instructional materials and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

H_{o2} There is no significant relationship between physical facilities and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

H_{o3} There is no significant relationship between human resources and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

H_{04} There is no significant joint relationship between instructional resources (instructional materials, physical facilities, human resources) and employability skills acquired by potential graduates of universities in the South-West, Nigeria.

H_{05} There is no significant relationship between methods of teaching science   courses and acquisition of employability skills among potential graduates of universitiesin the South-West, Nigeria.

H_{06} There is no significant relationship between assessment strategies and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

H_{07} The relative contributions of instructional resources (instructional materials, physical facilities, human resources),methods of teaching, assessment strategies to employability skills development among potential graduates of universities in the South-West, Nigeria is not significant.

H_{08} There is no significant joint prediction of instructional resources (instructional materials, physical facilities, human resources), methods of teaching, assessment strategies on acquisition of employability skills among potential graduates universities in the South-West, Nigeria.

H_{09} There is no significant difference between employability skills acquired by potential graduates in public and private universities in the South-West, Nigeria;

H_{010} There is no significant difference between the adequacy of instructional resources (instructional materials, physical facilities, human resources) in public and private universities in the South-West, Nigeria.

H_{011} There is no significant difference in the methods of teaching science courses in public and private universities in the South-West, Nigeria.

H_{012} There is no significant difference between the assessment strategies use in public and private universities in the South-West, Nigeria.

1.6   Significance of the Study

The output of this study is expected to be useful in planning and implementation of quality curriculum to achieve enhanced employability of graduates of Nigerian universities. Specifically, the benefits will be of advantage to:

i.   **Policy makers:** It would help the policy makers to have a better understanding of planning for educational policies, which in turn should provide basis for quality academic curriculum. It would also identify the skills employers are required from their prospective employees.

ii.   **Administrators:** It would provide the basis for administrators to better understand which of the indicators of academic curriculum in terms of instructional materials, physical facilities, human resources, methods of teaching and assessment strategies,requires more attention in planning and implementation.

iii.   **Employers of labour:** It would create opportunity for employers to be involved in curriculum planning of universities by incorporating the required skills needed from their prospective employees. This can be achieved by involving the various regulatory bodies (Associations and Councils) in various science–based disciplines.

iv.   **Researchers:** It would give future researchers an insight into previous studies on curriculum and employability skills and other areas needed to be researched into. It would also give future researchers the basis to replicate this study.

v.   **Lecturers:** It would help the lecturers to adopt the best methods of teaching the potential graduates, what adequate materials to employ in teaching them as well as the appropriate grading system to choose in producing employable graduates.

vi.   **Potential Science Graduates:** It would assist thepotential graduates to have more knowledge of the skills they are expected to possess before graduation which is significant with the global best practises.

1.7   Scope of the Study

Geographically, the study covered 36 accredited universities in the South-West zone of Nigeria as at 2017, having the following states in its jurisdiction: Oyo, Osun, Ogun, Ondo, Ekiti and Lagos. The universities cut across federal, state and privately owned institutions. The zone was selected for the study because many of the universities in these states had developed and implemented science curricula that could lead to the acquisition of employability skills. The study focused on the potential graduates and the academic staff in the Faculty of Science of these universities during 2017/2018 academic session. Other categories of respondents in this study were employers of labour and officials of the National Universities Commission (NUC).

Faculties of Science were selected because they were peculiar to private and public universities in the South-West, Nigeria. Also, the choice of this selection was in line with the government's 60-40 Science-Humanities based policy on admissions, staffing and allocation of resources. Furthermore, the homogeneity of the learning objectives of science discipline provided justification for the parameters to be measured across board. In addition, the uniqueness of science curriculum that is based on its practicality is an added advantage. Equally, the basis of these curriculum-based learning objectives was pinned to the ideas of Benjamin Bloom and his cohorts who worked on the 'taxonomy of educational objectives'. This curriculum emphasises critical and analytical thinking skills and abilitiesthat are required for employability in the society and to the academic staff members who prepare the curriculum using the National Universities Commission Benchmark for Minimum Academic Standard(NUCBMAS) as a guideline.

In addition, the potential graduates of science must have gone through the required six months internship (Student Industrial Work Experience Scheme, SIWES) which would have accorded them the opportunity to exhibit or apply the soft skills acquired already in the classroom; and the students must have spent considerable number

of years in the university and are ready to be released to seek employment. Employers of labour in selected organisations were also captured.

The National Universities Commission was also covered since it is the regulatory body of all universities in Nigeria. In content scope, the study covered quality of academic curriculum, which is measured by Instructional resources (Instructional materials, physical facilities, human resources),methods of teaching science curriculum, and assessment strategies needed in achieving the goals. The five indicators were considered to be the delivery systeminvolved in passing the learning experiences to the potential graduates. What the curriculumcontains (content) was not covered in this study because the researcher does not have any authority to determine the content. This is because what goes into content is prescribed and controlled by the university regulatory body (NUC) in Nigeria.

1.8   Operational Definition of Terms

Major terminologies employed were defined technically and how they were used in the work:

Employability: Employability is the capability possessed by an individual, which makes him/her suitable to be employed. In the context of this study, employability means an ability to secure an employment after graduating from university having possessed certain skills required by employers of labour.

Skill: Expertise to do a task that comes from training or practice. In this study, skills refer to those attributes potential graduates have that enhance their opportunities to get jobs. The attributes are many, including self- awareness, self-confidence, adaptability, creativity, computer literacy.

Employability Skills: These are attributes required by employers of labour from their prospective employees in order to be employable and maintain employment while moving on in their life careers. These attributes are expected to be acquired while in the university through their comprehensive interactions with their coursecurricula. These include: leadership, interpersonal, problem solving, presentation skills, communication (Oral), analytical, information technology, decision-making, critical thinking, creativity, teamwork, adaptability, self-confidence, independence and initiative.

Science Graduate: Refers to a person recognised by a university in science-based disciplines as having satisfied the requirements of a degree course studied at the institution. In this study, the potential graduates in science-oriented disciplines constituted the science graduates.

Quality of Academic Curriculum: This refers to the attributes that the content of an academic curriculum must have which include coherence, relevance, rigour, flexibility and currency in order to develop employability in students as needed by employers of labour. In other words, the methods of teaching must be coherent, relevant to the needs of the students, rigorous, flexible to accommodate changes and must be current. This is also applicable to instructional materials as well as the assessment strategies.

Instructional Resources: These involve the instructional materials (IM) physical facilities (PF) and human resources (HR), used in achieving effective teaching and learning in the university.

Instructional Materials: These are physical resources intended to be employed in complimenting methods of teaching in the classroom which included: textbooks, science laboratory equipment, projectors, computers, journals, interactive board, films, slides, filmstrips, animation videos, pamphlets among others.

PhysicalFacilities: They are hardware used for purposes in organisations of something at any level. In this study, physical facilities in universities are regarded as buildings, furniture, laboratories, workshops, apparatus, equipment, classrooms and library which will motivate students towards their learning objectives.

Human Resources: These are assets that are inherent in the awareness abilities of the people. In this study, they are regarded as lecturers using various appropriate and defined methods to teach potential graduates in implementing the curricula in order to achieve the learning objectives which are the employability skills.

Methods of Teaching Science: These involve how the various topics set aside in the course outlines are being passed across to the potential graduates. These may be through inquiry methods, conducting experiments, lecture-discussion method, and observation methods among others.

Assessment Strategies: These connote different ways in which students' performances can be reviewed in the process of or after teaching and learninghad taken place. Performance review can be expressed in formative or summative terms.

Curriculum Implementation: This connotes how a set of courses and their contents were carried out through teaching. In this study, curriculum implementation has to do with how successful the curriculum content had been carried out by lecturers.

Learning Objectives: They are referred to as goals defining what the students would have gained after completing a programme. In the science-based disciplines, the objectives are: wide demonstration of practical training and applicability of ideas gained; development of abilities that will be useful to secure job opportunities; and provision of foundation knowledge towards further advancement in education among others.

Work load: This connotes the amount of work assigned to a worker for a stipulated period. In this study, workload means number of credit units being carried in a university system by either the students or the teachers in a semester or a session in cumulative. The work load of a teacher per week depends on whether he/she takes two or three credits courses. In total per week, a teacher must not take less than 12 credits which is the full load coupled with other responsibilities assigned by the appropriate authority.

Teaching Duration: This is the period allotted to both the teachers and students to be able to complete course content in a university. This is usually stated as 2 or 3 hours per week per course, which can run between 12 -15 weeks' time frame which serves as the benchmark for every university.

CHAPTER TWO

REVIEW OF LITERATURE

Chapter Two focused on literature review. The review discussed various concepts and theories to provide sound conceptual and empirical underpinning for the study. The theoretical and conceptual frameworks were also discussed to provide direction for the research.

The review is hereby presented according to:

2.1 **Conceptual Review**

    2.1.1 Employability Skills

    2.1.2 Quality Academic Curriculum

    2.1.3 Instructional Materials

    2.1.4 Physical Facilities

    2.1.5 Human Resources

    2.1.6 Methods of Teaching

    2.1.7 Assessment Strategies

2.2 **Empirical Review Studies**

    2.2.1 Instructional Materials and Employability Skills

    2.2.2 Physical Facilities and Employability Skills

 2.2.3 Human Resources and Employability Skills

    2.2.4 Methods of Teaching and Employability Skills

    2.2.5 Assessment Strategies and Employability Skills

2.3 Appraisal of Literature

2.4 Theoretical Framework

    2.4.1 Quality Enhancement Model

2.5 Conceptual model of input, process and output in Academic curriculum

2.1 Conceptual Review

This section reviews the general idea of authors on concepts such as employability skills, Quality Academic curriculum, instructional materials, physical facilities, human resources, methods of teaching and assessment strategies.

2. 1.1 Employability Skills

The essence of the university education system is to provide trained and educated personnel to meet the country's needs. Universities are also established to provide array of enlightening opportunities for individuals with diverse interests, skills to contribute to national development; employability skill are therefore, considered as important outcomes. Merrifield (2013) defined employability skills as attributes that come with trend of changes related to any employment one seeks for that include communication (oral and written), leadership, teamwork, initiative and analytical thinking. In corroborating Merrifield, the United States Department of Education (USDE, 2016) viewed employability skills as essential for attainment in the labour market at any stage in a work place, which one can learn in the classroom as well as during career development. However, Atkins (2013) viewed the attributes in terms of young adults that could not proceed further in their schoolings due to streamlining of such set of age group from the working class. Overtoom (2000) on the contrary, stated that, these abilities can be used from one job to another while Cole and Tibby (2013) in Kester and Aderinoye (2020) defined employability skills as a range of abilities or competencies that individuals must develop during life through education, training, work experiences and extra-curricular activities. In the same vein, Yaya (2004) asserted that employability skills are non-technical skills and competencies that are sought after by employers of labour. Equally, since the economy is changing, employability skills are very vital to match with the changing economy which can be achieved through education. As a result of this, employability skills appear to be a crucial element for university graduates on whether they will be employed or not.

Education is pertinent to every generation for cultural transmission, knowledge and societal values (Abari & Odunayo, 2012) which is the aftermath of strict admission interaction with other factors at the processing stage. Managers are bothered when many

efforts are expended to put potential employees rightly on concerns that are supposed to have been taken care of while in school which showed incompetencies. Adequate learning and employability aims must be encouraged by learning, teaching and assessment strategies that are in line with the curricular plans. The quality of graduates produced in Nigerian universities is undoubtedly a research area of great concern to educationists. Today's organisations are looking for the kind of manpower which will not just have the basic academic understanding and ideas but will be able to give precise skill sets as well as the elementary skills needed for their respective jobs (Varwandkar and Deshmukh, 2012). Since the campaign for quality teaching and learning had increased, so also is the increase for university education all over the world. It is pertinent for a government of every nation, irrespective of the costs, to make provision for education, not just any type but an inclusive and qualitative one. The degree of quality of human capital development is determined by the quality of higher education (Obadara and Alaka, 2013). This signifies that, employability, being those personal attributes and skills learnt over a period of time,will influence how quickly university graduates secure jobs as well as becoming successful in their various careers. This will definitely allow the graduates to be useful for themselves as well as the community and the society in general when they become employable.On the other hand, University of Exeter Centre for Teaching and Learning (2002) defined employability from three different perceptions namely: the Employers'; Students' and Institutions' perceptions.

Employers' perception of employability is about a potential graduate possessing basic skills and experience; Students' point of view of employability involves making themselves attractive and inviting to employers of labour in regards to skills and attributes, knowledge and experience so that they can get recruited into the labour force. Similarly, the institutions' perspective on employability is about the development of students through variety of strategies to enhance their learning, broaden their views and experience for them to actively join the workforce. But in practice, employability is about having the knowledge and understanding of the subject-matter; developing skills, both subject specific and personal as well as key skills. It also includes being able to articulate learning with work experience, which is done through internship and personal

development-reflective thinking which helps in having the appropriate personal qualities. In other words, employability can be described as a subset of employment.

Previous studies (Pitan, 2011; Al-Alawneh, 2014; Asuquo and Agboola, 2014) noted that certain factors must have been responsible for not being able to produce employable graduates. These factors include quality assurance, motivation of staff, contextual teaching and learning, co-curriculum management, culture of the organisation as well as evaluation techniques used in the preparation of students.

Hart Research Associates (2013); Drummed and Rosenbluth (2015) identified top ten qualities for prospective employees as listed by employers of labour to include communication(oral and written), decision-making, problem-solving, critical thinking, teamwork, conflict management, leadership, responsibility and initiative skills. These qualities are of great importance to managers of any establishment. However, researchers like Stuckey and Munro (2013) opined that skills gaps exist in the capabilities of the potential employees and what the managers would have preferred them to have. In the same vein, Jackson (2013) and Strachan (2016) emphasised that university graduates may possess these skills and might not be aware that they have them. It is necessary that the universities develop the means of educating the students about employability skills required of them (Harrison, 2017). No organisation will employ graduates who do not display certain skills and knowledge acquired in school. This is because these organisations would not like to incur excess expenses on newly-employed graduates by providing training that they would have acquired while in school.

Oyekan (2012) asserted that qualitative improvement and expansion of tertiary institutions are of great importance because knowledge and skills required in contemporary economic activities can only be effectively imparted and expanded upon at an advanced stage of learning. The main role of tertiary institutions is to produce the required high-level human resources for a sustainable economy. Other benefits, according to Obanya (2002), include enrichment of an individual through acquisition of intellectual skills for the pursuit of self-development, enculturation, development of affective traits as well as family-based lifelong learning skills. This will make onedevelop the spirit of enquiry and long-term thrust of knowledge. Employability is not just gaining employment but having the means to secure and retain employment (Hind and Moss,

2011) in Asuquo and Agboola (2014). It connotes an innate potential possessed by a graduate to obtain and succeed in graduate level positions. Similarly, Ruhizan, Seamah, Ramlee, and Kamaruddin (2011) see employability skills as skills required by employers of labour from their prospective employees aside the knowledge and skills related to the workplace. Burgaz (2008) on the other hand, acknowledged employability skills as qualities or attributes that applicants looking for jobsmust have to find one, stay on the job and even move from one job to another.

Olofintoye and Prince (2013) asserted that most Nigerian university graduates oftentimes might not match information received in colleges with that of the job market. Additionally, most of thegraduates (Bachelors, Masters, and Doctorates degree holders) stay jobless, likewise complaints of lack of job-related skills by employers of the ones that have jobs (Asuquo and Agboola,2014). Meanwhile, the modern day society can be seen as focussing more on quantity than quality of graduates produced in higher institutions.This development has produced graduates with certificates and diplomas without commensurate skills required to function in the market (Al-Alawneh, 2014).

Notably, context-globalisation had manipulated demand for higher education by promoting higher skill development between students and employers. This is as a result of higher education being thought to offer individuals new opportunities in relation to the know-how and assisting them in improving ways by which knowledge can be produced, accessed, disseminated, controlled and managed (Akinyemi and Bassey, 2012).

The employability skills needed by these graduates should be emphasised while the contents of the curriculum must not be market-blind. The skills needed in job market include the generic, core and process. Great-batch and Lewis (2007) viewed employability skills as ''transferable'' skills that are free of particular occupational sector and organisations. Generic employability skills are those abilities exhibited across different jobs, organisations and sectors. The skills are also known to be essential and are key competences. They are necessary not only to be used to get employed but for advancement within an organisation. These skills include but not limited to information technology, interpersonal, oral and written communication, teamwork, adaptability, self-confidence and independence. Knight and Yorke(2006) also identified some skills that

can be categorised as process skills to include critical thinking, analytical thinking, creativity, computer literacy, problem solving, decision making among others.

Some of these skills are discussed in terms of what is expected of a graduate when the skills are acquired.

Leadership skills: A leader motivates his team. This soft skill helps to positively interact with employees or team members. A leader must be creative and being creative is all about building up new ideas, having the ability to communicate clearly to the people he is leading and being able to provide adequate feedback. Delegating responsibilities to others, trustworthiness and commitment to his job and flexibility to solve problems where he works. Employers seek for these characteristics in their prospective candidate to be hired for a leadership role. This is among the most valuable skills required by employers of labour. Dabalen, Oni and Adekola (2003) affirmed that qualities of potential employees at the entry level of work havedepreciated over years and oral and written communication skills top the list. On the other hand, Speight, Lackovic and Cooker (2013) investigated various ways and concepts that can be employed in teaching these qualities or attributes outside the curriculum. Also, they emphasised the hidden approach where students systematically learnt the skills but not referenced by the teachers. The third approach used by them was embedding the employability skills into the curriculum which is common in Nigerian universities using Benjamin Bloom Domains of Educational Objectives.

Problem-Solving Skills: A graduate who possesses this skill must be creative in providing unique solutions to potential problems and needs. Problem-solving goes hand-in-hand with intellectual reasoning, which helps in solvingproblems that require logical reasoning to proffer best possible solutions. Problem-solving integrates other skills to include analytical thinking, oral and writtencommunication, decision-making and dependability. Difficult issues to be resolved might be systematic or mathematical but collaboration with other skills gives the needed and innovative solution. This skill requires time and practice to be able to develop it.

Information Technology: This is practical in nature and a graduate must have the understanding and the capabilities necessary to perform certain roles. This may include having the knowledge of some simple software applications such as Microsoft Word,

Excel and others. This skill is categorised with interpersonal skill. This skill is needed to interact with colleagues and to pass ideas to other team members. This is important in the hiring process of a new employee. Sometimes, combinations of skills are required in order to become employable.

Presentation Skill: This can be one-to-many discussions in a classroom or with colleagues at work. Whatever it takes, there is need to articulate ideas boldly and clearly to the people involved. Ideas can be laudable, but without effective conveyance, no one would appreciate such idea. The approach used in presentation and its tools can help to strengthen this type of skill.

Teamwork: Having the teamwork skill shows that one is able to communicate ideas and listen to others' suggestions. Team playing is appreciated by employers rather than being individualistic at work. Employers of labour value teamwork as a skill demostrated by potential employees.

Adaptability: It describes how much an individual is able to adjust to a course of action in order to suit a particular situation. This is a natural skill or, better regarded as generic skill. Due to some unforeseen and uncontrollable factors in the work place which one needs to adjust to, there is need for acquisition of this skill. This is one of the indispensable skills that keep the work place running and up-to-date at the same time in all its services. For prospective employee, this is important since new rules and regulations are being developed within and outside industries. So, it is pertinent to adjust smoothly and quickly to such challenges without difficulties.

Independence: This is the ability to assess and initiate things independently, use imagination and common sense to solve problems. Use of initiative here means an ability to deal with situations without any prior instructions. This is also about being able to achieve a set goal with minimum supervision. The skill is self-directed and self-motivated.

Self-Confidence: This type of skill increases with experience in having mastered particular activities. The skill is about feelings of trust in one's abilities, qualities, and judgement. Self-confidence can be built up by affirming and visualising what an individual wants to be as well as setting up to win. All the afore-mentioned soft skills are required of new employees by employers of labour. Merrifield (2013) submitted

thatemployability skills by graduates reporting that employability skills are in many forms and that these skills such as communication and teamwork are needed and must be aligned with subject disciplines. Also, Science, Technology, Engineering, and Mathematics Network (STEMNET, 2019) reported the top ten skills they will be looking for in potential employees as compiled by their United Kingdom-based companies. On top of the list is oral and written communication, interpersonal skills, problem-solving, initiative and teamwork. Similarly, Enyekit (2012) maintained that the trendy components of communication which works for everyone and are taught include: being able to interpret a message, dialoguing with others, understanding inscriptions and attending to what is being passed across.

Oyebade and Adedeji (2014) viewed employability as an attainment, skills, consideration and peculiar characteristics, assisting potential employees to secure a job and thrive in their selected profession. They argued that the graduates' employability status in higher institutions is still very low, owing to the poor preparation and very low university-industry linkage. They suggested that, entrepreneurship development programmes are necessities that cannot be undermined in any curriculum.This is to promote enterprise culture, which can include: self-reliance, risk-taking and an environment which rewards efforts and initiatives. Equally, Brown and Hesketh (2004) asserted that due to the changing nature of work, employability skills acquisition had become crucialto secure a job, maintain the job as well as moving from one employment to another.

In Nigeria, different sectors have contributed greatly to all spheres of the economy by making available amenities at the Federal and State levels but the Local level needs more efforts geared towards generating employments for young population. The local level must also made school products employable through appropriate infusion of technical, vocational and entrepreneurship skills' acquisition programmes. There is the need to motivate the youths to learn a trade as an additional skill to their formal education in secondary and higher levels. Further findings of Oyebade and Adedeji showed that the curricula had been more of theoretical than practical instead of providing useful and professional skills to them.

The Nigerian National Policy on Education (FRN, 2013) specified that, tertiary institutions aimed at contributing to national development through relevant manpower training, acquisition of productive, physical and intellectual skills for self-reliance. Meanwhile, the poor and unimpressive educational environment constituted a major constraint to the realisation of these goals. Pitan and Adedeji (2012) noted a mismatch between tertiary institutions' products and what is needed by the employers while employing organisations in Nigeria, seeks to identify and hire persons with the potential to produce extraordinary skills.

The former Nigerian President, Olusegun Obasanjo introduced entrepreneurship development in tertiary education in 1973 to inculcate basic knowledge, enterprise development and management in students. This program was created to give students experience in addition to theoretical learning as well as to improve practical skills of students for disciplines such as engineering, medical science, natural science, technology, applied science among others. The program supposed to serve as a connection between academic and applied education. Since then, entrepreneurial study has remained a core aspect of university curricula and serves as a prototype for business study, novelty and occupation advisory centres in Nigerian higher institutions. Policy on students' industrial work experience scheme (SIWES) put in place by NUC as part of the curricula for all Nigeria undergraduates to ensureschool-industrial linkage has not gone far as expected. This is due to the fact that appropriate agencies are not properly managed to achieve the objectives of the policy.

According to Akanmu (2011), higher institutions in most countries in which Nigeria is inclusive, rarely teach life skills as part of their curricula. Implicitly, therefore, higher education curricula have emphasised teaching of basic knowledge (cognitive) rather than holistic progress towards other domains: emotion/feelings (affective) and motor skill(psychomotor). Oyebade and Adedeji (2014) buttressed this position in their assessment of Nigeria's higher education curricula by observing that the system of education taught in institutions is not applicable to job market' needs and that the curricula are obsolete. They further stated that only the theoretical aspects of the curricula are being taught while the practical aspect is being neglected.

Another means of measuring employability-related learning is curriculum auditing. Curriculum auditing points to the need to rethink pedagogic and assessment practices. It is assumed that employability skills take time to mature and the need to replicate employability beyond individual programme components was suggested. They also view employability has been enhanced through personal development planning and argue that the successful implementation of employability lies on the level to which students (beneficiaries) see a "pay off" for the effort that they put in. They concluded by emphasising that, there is need to reverse the constant concerns about employability and suggest ways of enhancing the scheme.

Weligamage (2009) viewed employability as "organisation of plain mechanisms whereby learners' progress in the development of qualities set out to find a job". These attributes or qualities in the realm of education are pinned to develop individuals, capable of impacting all phases of university lifes, and exhibition of academic programmes as well as extra-curricular activities. The review of research findings by Weligamage (2009) showed the trainers' ascertained trainees' qualities of promptness, accountability, dedication and approach to the work of their wards. The research concluded that colleges are now integrating extra-curricular activities into their programmes and changing subjects' specific skills' development through specialised modules.

The skills needed by employers must be incorporated into the curriculum and implemented accordingly, if the problem of employability will be solved. The skills include: knowledge, thinking, personal attributes, practical, time management, teamwork, leadership,among others. These are expectations of employers from their potential employees. Asuquo and Agboola (2014) addressed quality education through improved curriculum and contended that, the essence is to provide millions of recipients with skills to tackle poverty, maintain improved status, mobility and decision-making for national and regional developments.

Brown and Hesketh (2004) in Asuquo and Agboola, (2014) broadly examined employability differences of university products in public and private sectors of South–South, Nigeria. The research design wasEx-post facto with a Multi-stage sampling of 1200 graduates in the labour market. Their results indicated that universities outputs, employability level are weak and that the ranking of university outputs in the country

were slightly different compared to their gender, type of educational organisation (private and public) and educational qualification. The result indicated that, regardless of the respondents' demographics, Nigerian universities' output maintains weak employability. They noted that a lot of factors ranging from graduates' capability, the value of training, content composition rather than their gender and educational credentials could account for the low rating.

In the same vein, Dabalen, Oni and Adekola (2003) in Asuquo and Agboola (2014) that the Nigerian graduates' employability is poor outrightly. Therefore, a lot of measures still need to be introduced by the government as a means of restructuring Nigerian universities curricula to address current economic challenges in terms of graduates possessing the right skills to secure employment in the labour market.

Adeyemo, Ogunleye, Oke and Adenle (2010) conducted a study with the aid of questionnaire administered on managers in community ventures, personal business, professional associations, non-governmental organisations (NGOs), and education sector and science graduates. The study population covered one hundred science graduates in various establishments. Two main factors were reported as the genesis of the growing dilemma of not being able to find any job qualified for to do. Problems identified include: slow growth rate of economy to take in high number of graduates entering the job market; a classic case of supply exceeding demand, and inability of universities to train students with appropriate skills of 21st Century competitive global economy, that is largely influenced by the use of information technology (IT).They observed that graduatesemployment opportunities cannot be attributed solely to the laxity on the part of authority in charge of its provision, rather it involves quantitative structural skills relation. The concern remains that, employers expectations vary, and cannot be easily ascertained, owing to a number of issues that may affect the need for recruitment. Therefore, universities responsibility as training institute is not limited to imparting academic skills; rather, the responsibility includes training personnel to be disciplined, by inculcating in them societal pleasing human characteristics such as honesty, hardwork and loyalty.

The findings of Adeyemo et al (2010) showed four skills were rated namely: problem-solving, ICT, self-directed, and analytical skills. The finding also substantiates

that the universities are still emphasising "theory and downplaying practical. They concluded that most of the graduates cannot solve problems or think analytically when faced with job situations due to the fact that they are not practically equipped or knowledgeable.

They further suggested that, universities may need to change their curricula periodically to certify that the teaching contents reflect advancing logical knowledge and worldwide market. It is very necessary that universities should centre on curricula updating and course content orientation to meet employers' needs, expand the coverage of training on the job as well as introduction of self-reliance programs. It will metamophorsised into the establishment of centre for initiatives and development in the universities. It has been observed that some public universities have made this a mega project and hope for sustainability of the centres. Private universities are trying in this regard but they only go for the internship programme; they do not create avenues for students to develop their personal skills in terms of using their initiatives to be creative. This is due to shortage of funds, as explained by most of these universities.

Good curriculum design that takes into consideration employers' need will assist the learners greatly in constructing, maintaining and developing a number of skilful practices (Knight and Yorke, 2006). Most of the students always look forward to the Student Industrial Work Experience Scheme (SIWES) period to get away from their usual academic environment. The fact still remains that SIWES cannot serve as the only experience or skill acquisition avenue for the students because, they were not properly monitored and beyond that, employers tend to manipulate reports in favour of the interns at times.

There should be other means to garner skills and experiences. In as much as SIWES is a laudable programme, the opinion being expressed in different quarters is that, professionals outside the university system should be engaged in monitoring and supervisionof program, probably by industrial training officials or other significant and relevant bodies. The thinking is that the program will boost the morale of the students and encourage dedication because an external person is involved from their usual lecturers they engage all the time.

In addition, the BMAS provides the minimum academic standards for all universities. Thus, ensuring that regardless of the institution, Nigerian universities products should develop an irreducible minimum knowledge and skills at the point of graduation which is taken as the core curriculum. This is the reason for putting the Graduates Need Assessment Scheme in place by the regulatory body responsible for the management of universities to verify whether stated learning outcomes have been acquired or not. Adeyemo, Ogunleye, Oke and Adenle (2010) asserted that how applicable, and the worth of post-secondary education amidst the creative world of today should be based on purpose and education contents. This indicates that, social expectations and skills required to function well in the working place could only come forth by applying accurate methods of teaching and students' learning programmes.

There must be an attachment to employability skills development in university curriculum. These skills should not be omitted from curriculum of each department and programmes. Ananga (2015) in British Council Report on "University Education, Employability and Skill Gap in Ghana noted that, there is the need for every department to provide the students with the attributes that will give them the opportunity to fit in into world of work by coaching them in proper communication, teamwork, public speaking, writing efficiency and critical thinking. It is important to note that, irrespective of efforts taken at incorporating employability into the curriculum, departments need to understand how each new course might address societal challenges before approval. Also, periodical review of content is needed to enhance and tailor courses towards emerging job opportunities. The policy implication of this is that, it will generate appreciable public confidence and produce skills development.

2.1.2   Quality Academic Curriculum

Quality can be described as a value placed on a product or service provided in an organisational setting with intent to facilitate absolute stakeholders' satisfaction (Chartered Quality Institute (2016). In managing organisational quality, this institute highlighted the termsto include being able to cultivate and implement real system control that is relevant to employee's requests; guaranteed commitment and continuous qualitative principles and methods of achieving improvements.

In the same vein, Garvin (1987) highlighted the meaningof quality via: adequate presentation, structures involved, how much should one depend on it, adherence, can it be used for a long time before change is introduced, how it can be maintained, how it looks in appearance, and what is observed to be quality. Thereare two beliefs involved in finding meanings to quality in any school environment.The beliefs laying emphasis on learners' growth of ideas as well as the positive roles played by emotional intelligence (UNESCO, 2016b). This indicated that quality is a significant factor of what is been taught in schools.

A report from the Ateneo DE Manila University Centre for Learning (2017) identified two components of academic curriculum to be core curriculum (skills acquired and knowledge gained) and major curriculum (contents taught). The study focused on the core curriculum and not the major curriculum. This curriculum helps potential graduates to develop a diversity of skills and attributes needed in becoming independent learners. When partnership is established between the actors of employability- primary actor (school, students) and secondary actor (employers of labour and parents), and the focus is on academic and personal competencies, these will assist the potential graduates to take their places in a contemporary society.

The course content, which is the curriculum, must be coherent in order to integrate beliefs and values as well as the linkages among course descriptions, learning outcomes, teaching methods and assessment strategies clearly articulated. The relevance of the curriculum is an evidence of stakeholders' involvement in the products of what is being taught which shows the substance students are made of. Also, comprehensiveness of course content, its flexibility to reflect delivery options and diverse methods as well as the evidence of current knowledge, are qualities that must be considered in other to produce employable graduates.

On the other hand, students as inputs to produce employable graduates contribute significantly to basic foundation building in knowledge acquisition. A student that is deficient in a major subject to gain admission into the University might find it difficult to cope with school workload. This is in regards to where maximum workload is require for a student coupled with fixing the area of his/her basic ordinary level result deficiency. Even with the maximum workload for students, teachers do not comply sometimes with

teaching duration of courses. It is either some topics are left for students to figure out themselves or students are being bombarded with so much information. Meanwhile, teachers have their maximum workload to carry per semester which can be between 12-14 credits.

Although, with the maximum workload for teachers, some still combine with administrative work within and outside their faculties. This can be overwhelming for teachers, and thereby might not put in their best. It can also become overwhelming for a student who is struggling with academic work. If these inputs are inadequate or deficient, no matter how laudable the processes in achieving employability skills are, there will be poor outcome and vice-versa. Quality is similar to distinctiveness, exclusivity and excellence, while standards of excellence serve as determinant of quality concept. The approach is thereby regarded as excellence standards approach (Dirk, 2019). Quality of academic curriculum is also viewed through learners' satisfaction, job market needs and academic contents of what is required to be a scholar in one's discipline.

Quality as a concept is embedded in quality assurance in which the community labeled as "fitness for purpose". Georgiadou (2016) viewed quality from the transcendental, user, manufacturer, product and value-based perspectives. Curriculum quality checklist provides a structure that reflects whether or not the school has dealt with the appropriate content concerns while planning for a programme. Camosun College, Centre forLearning (2017), identified qualities that a good curriculum must have to include:

i.   Coherence: It entails the articulation of beliefs and course description.
ii. Relevance: There must be evidence that stakeholders are involved in all the processes of development, assessment and making the results meaningful.
iii. Rigour: This has to do with the comprehensiveness of the content as well as the clarity and understanding of the curriculum.
iv. Flexibility: Individual's learning needs must be recognised as well as their abilities. The delivery option is also considered and there must be an appropriate use of assessment methods when needed,among others.

v.   Currency: There must be an indication that recentinformation and updated methods are used in the training of the students while the methods applied, must be current.

2.1.2.1   Goals of Science in Academic Curriculum

A quality curriculum has its goals appropriately stated and science curriculum is a good example. The goals of the curriculum give birth to its learning objectives. That is, what will be achieved after the contents are taught in the University.

Science constitutes different ideas andprocesses that established the acceptance of a structure that operates normally (Bybee, Powell and Trowbridge, 2010). Both basics are crucial and no one can advance in education without having the view of the processes. The ideas have to do with factual evidence and models verified a number of times. The essence of higher education is to prepare individuals for a gainful employment in the future (Livannos, 2010; Marita and Felix, 2010). This is so because it is next level for a better job placementas far as the labour market is concerned. Every citizen wants to be educated to the level that he or she will not have problems in measuring up with others globally. In support of Livanos(2010), Marita and Felix (2010); Kleijn, Mainhard, Meijers, Pilot and Brekelmans (2012) categorise goals as learning, assessing, and self-regulation. This means that students are supposed to learn the skills, being able to work with little or no assistance, likewise maintaining specific principles requiredof them to be certified afterwards.

Shernoff (2013) stressed that the ideal aim of schooling involved being able to perform certain tasks without assistance which delve more into the specifics of science. Furthermore, National Research Council (2007) cited in Bybee, Powell and Trowbridge (2010) remarked that curriculum should be designed to meet up with the qualities required to have different professionals in the field of science. This idea will go a long way in creating more of interests for deep understanding of the subject.

Similarly, National Policy on Education (FRN, 2013) highlighted the aims of the University as:

i.   Contribution to theimprovement of states by preparing near-topworkforce

ii. Provision of accessible and affordable quality learning opportunities in formal and informal education in response to the needs and interests of all Nigerians;

iii. Provision of great professional advicewith enduring knowledge of subjects that gives room for students to work on self-owned businesses in the future;

iv. Promotion, encouragement of bursary, as well as rendering of needed help to the immediate environment;

v.   Fortified, and strengthen generalunion of citizens;

vi. Encouragement of general, globalacceptance and alliance.

The aims are achievable through the adoption of:

1. Giving admission tooutstanding applicants;

2. Empowering the learners with excellent trainings and ideas;

3. Embarking on improved investigative process;

4.   Worthwhile principles, abilities, amenities and assets;

5. Relevant hands-on experience through the content to reflect the desires of potential employers;

6. Producing and circulating information that will add value to the general objectives, which will allow learners to thrive wherever they find themselves;

7. Well-structured, coordinated andsupervised Students Industrial Work Experience Scheme(SIWES);

8. Minimum school ideals by propermonitoringorganisations; and

9. Comprehensivereliable university entry levelproceduresnation-wide.

These are general goals of higher education which the science education coined its goals from. It is a discipline that shape individual learner in a different dimension through content, proceduresand methods (European Commission Report, 2015).

Every discipline has goals to be achieved. Science discipline is not an exception in its drive to produce employable graduates in all ramifications. There are many goals of science that are peculiar to all Faculties of science or Colleges of Applied sciences in the universities of South-West, Nigeria. The category of goals that is peculiar to these universities, were identified, by Bybee, Powell and Trowbridge (2008) as the objectives underlying science curriculum and instruction. These include:

i. Making sure students are trained in basic science subjects;

ii. Applying the ability gained (knowledge) to solve critical problems facing the society;

iii. Giving opportunity to achieve the analytical thinking skills;

iv. Enhancing critical thinking in the learners for good judgement;

v. Development of problem-solving skills to allow students to exhibit their leadership skills and

vi. Acquiringskills in using the scientific method.

These goals must be translated into objectives that will help teachers to prepare instructional objectives. At the end of the goals being translated to objectives, learners are to acquire knowledge and skills required from them which they can apply subsequently in their future endeavours.

The goals of science discipline in theuniversities of South-West, Nigeria are not out of place in terms of taking cognisance of such universities' mission and vision for their establishment. Bybee, Powell and Trowbridge (2010) corroborated Bybee et al (2008) by opined that, there are many goals of science teaching based on simple criteria:

- Goals must be all-inclusive torecognisedtargets and purposes of the subject being taught, clear enough to be readby all, and must not harbour any preference. There must be no allegiance to a particular method of teaching that must reflect differentiated ideas and concepts which can be certainlyusefulas instructional objectives.

Goals must inculcate the learning outcome or behavioural attributes expected at the end of the learning process which are employability skills. With the goals clearly stated, the four phases of the academic curriculum that will determine its quality can then take its toll.The learning objectives of science curriculum are deduced from its goals while educational objectives propounded by Benjamin Bloom and his cohorts laid the foundation of the goals. This is because, the curriculum emphasises critical and analytical thinking, and problem solving, creativity and initiative which Bloom's taxonomy verbs were used to create. These objectives bring about the production of a well- rounded individual.

2.1.2.2 Planning and Implementation of Academic Curriculum

Curriculum is a course – specifically, a regular course of study or training in a school or university. Attempts to define curriculum tends to be prescriptive, descriptive or a combination of the two (Yusuf, 2012). Prescriptive definition explains what ought to happen and often take the form of a plan, an intended programme or some kind of expert opinion about what needs to take place in the course of a study. Content (curriculum) is essential due to its ability to give detailed information grounded in various disciplines in which the values gained can also be advantageous to the society at large (Kolawole, 2015). In other words, it is not possible to have a meaningful school without a curriculum if indeed there is to be education. Yusuf (2012)viewed curriculum as a recommendedframe of proceduresand understanding that can be easily expressed.Akpale (2010) on the contrary, viewed curriculum as planned and unplanned educational experiences in which students and teachers work for the attainment of educational goals.

According to Wikipedia (2016), a syllabus (curriculum) consisted of different subjects and their contents, which are taught in a school system. Contents recommended are nationally designed to include topics assumed, and the information achieved. On the other hand, Kelly (2009) in Yusuf (2012) viewed curriculum as a set courses (subjects), to be fulfilled in a school system. She further explained this statement by qualifying it to involve subject taught in the class. It is a fact in university education that varieties of contents taught provides opportunity for learners to choose from various disciplines.

Prescriptive meaning of curriculum, offer a planned programme of what is intended to occur in the process of getting educated (Ellis, 2004).Indiana Department of Education (2010) in support of the prescribers view about curriculum, emphasised it to be an intended contact that learners have with tools, assets, contents of instructions coupled with processes for assessing the completion of learning purposes.

Descriptive meaning of curriculum, suggested what will happen when recommended contents are adopted. The meaning affords showing how the contents are taught and how reality works in the classroom.The key term in descriptive definition is more ofpractical. This definition is more than a prescribed one because it is a forced idea about an ideal situation and a status quo in classroom reality settings(Ellis, 2004). Hass

(1987) averredthat curriculum is a practical idea of importance gained by each learner undergoing a particular programme.

Brown (2006) corroborated Hass when he stated that, curriculum entails total students' involvement relating individual qualities to solving societal problems. Silva (2009) onhaving descriptive meaning averred that, it is about the application of the information acquired rather than the volume exposed to. Haas (1987) also pointed out that a wider meaning of curriculum entails, the totality of ideas gained while under training in the school which allows higher plans to be achieved.

Similarly,Tanner and Tanner (1995) in Hibahnaaz (2010) emphasised the curriculum to be a re-invention of information, ideas and practices whichenable individual concerned to cultivate the habits of demonstrating intellectual abilities. Kelly (2009) supporting Tanners' view, described curriculum as encompassing all ideas gained by learners to acquire capabilities in different varieties.

Olivia (1997) in Yusuf (2012) provided multiple meanings of curriculum as:

1. training acquired in school;
2. varieties of subjects taught;
3. content;
4. programme of trainings;
5. tools to be used;
6. developments arrangement;
7. intentions presentation;
8. schoolwork progress;
9. extra-curricular activities;
10. workers programs; and
11. classroom trainings acquired.

In a broader view, curriculum, seen a composite whole, include those ready to learn, the person giving the instructions, methods, as well as the output. Traditionally, it can be perceived as information passed from one generation to another in the form of organised knowledge.

Kolawole (2015) classified curriculum into three broad fields: a unit of study in the department, comprising subject areasoffered; study programme that specifies what is

done in a teaching and learning environment, how it is done, what it is done with, and how to be sure it is done properly; and finally, it is a course of study which people specialise in. Therefore, curriculum is the meeting point for the programme of teaching methods with learning experiences acquired (Dada, 1999 in Kolawole (2015).

2.1.2.3 Curriculum Typologies

i)   Explicit or written curriculum: This method contains a documented curriculum, text, or supportive materials selected to sustain the instructional schedule of school. It can simply be defined as documented evidences that contribute to formal instruction in the schooling experience.

ii)   An intended curriculum: The method provides detailed, recommended information, intentions on the school for use by a teacher.

iii)   Curriculum in-use: These are contents of thoughts and ideas from various materials. It is the actual content taught in the classroom. According to Cuban (2012), it is regarded as the real ideas passed on to the learners in the classroom not what is documented in the papers.

iv)   Received curriculum: These elements are the exact reality in the lives of the learners. It is the actual learning experience that can be applied to situations outside the walls of the classroom (Cuban, 1992,2012).

v)   Societal curriculum: Cortes (1981) in Wilson (2005) describes societal curriculum as huge, on-going, informal family curriculum, peer groups, neighbourhoods, religious bodies, organisations, mass media and other socialising groups.

vi)   Concomitant curriculum – Relates with emphasis on learning through family. This curriculumcategory may be received at worship centres and other agencies concern with teaching values, ethnics, morals and societal norms.

vii)   Phantom Curriculum: This includes prevalent information based on media exposure.

viii)   Hidden curriculum – Urevbu (1985) in Yusuf (2012) sees thiscurriculum category as what is not taught in the classroom yet played important roles in the school. Tanner and Tanner (1995) in Hibahnaaz (2010) tagged it ''collateral curriculum''. The authors argued that ''hidden'' implies deliberate cover up of some important

information unknowingly to the learners. Tanner and Tanner (1995) acknowledged that, this category of curriculum must be built into the intended experience the learners supposed to have. The curriculum sometimes account for the philosophical ideas being reflected by individuals in the future. The hidden or covert curriculum is a daily activity built-in as part of the school's arrangement.

Hidden curriculum includes messages and lessons benefited from simple school organisation. These are:

i.   Arrangement of the class according to numbers;

ii.   Self-controlled expression constructed in line with students' classroom comportment;

iii.   Maintenance of check-in and check-out orderliness among students and

iv.   The need for students to quietly raise hands in answering questions.

ix)   The null curriculum: It includes the contents not taught by teachers, thus giving students the message that these elements are not important in their educational experiences or in our society. Eisner (2015) advised on illogical curriculum that, the main point to consider is not being liable for what was taught but bearing the penalties of what was abandoned that was not taught.

The Eisner's standpoint represents a good example of the analysis of effect of academic curriculum on employability of Nigerian universities' graduates. If the curriculum captures the necessary quality contents of what the curriculum should entailed, taking into consideration the potential employers desires in their prospective employees, the challenges of universities' graduates not being employable will be over.

In other words, it is very imperative to mention that planning, monitoring, reforming and implementation of quality academic curriculum is important for graduate employability but what is more important here is the guidelines being used to plan this academic curriculum which is the benchmark. If the benchmark misses the contents of quality academic curriculum, in terms of skills acquisition, then the universities will miss out employable graduates.

2.1.2.4 Planning of Curriculum

Preparing for something can have a very difficult procedure and time consuming; a good strategy is the produce of that procedure (Gbamanja, 2002) in Nicholas(2006, pg13). Planning of curriculum can be overwhelming with the view that quality must be assured. This stage of curriculum design cannot be handled with levity because if the planning stage develops problem, all other stages will be imbalanced, and the purpose of planning the curriculum will be defeated.

In the same vein, Kolawole (2015) asserted that planning can be a very crucial process when it comes to developing a curriculum. It involves planning for human and materials resources, the availability of adequate manpower, materials to be used and time. Curriculum planning refers to the creation of curriculum. An architect of the content(curriculum) design act as the major implementer in bringing all the components together like thetopics,description components and assets among others (Oliver and Hyun, 2010).

A curriculum planner not only plans for the content but also for both the physical and human materials, which are major components of a planned curriculum. To plan curricula means to anticipate actions, directed towards desired goals (Lamm, 2009). Every topic in the proposed plan must be included when designing the contents. So also, cognisance of what quality is must also be taken into consideration.Its preparation must be in such a way that, lessons to be taught must be interesting, and teachers must adopt the best method in the classroom.

Curriculum planning has to be prepared in such a way for students to learn necessary skills without becoming bored. A curriculum may help teachers and other educators to evaluate the best strategies for effective classroom instruction. The current system of education is being controlled by the central and local authorities.National Universities Commission (NUC) oversees affairs of universities' curricula, funding, admissions, and others. The body gives the universities the minimum academic benchmark to follow; regulating the courses to offer in the universities and make sure that the minimum standard is adhered to.

Private universities engage in more elaborate curricula which have positive impact on the students, giving wide-range of knowledge to be planned for and eventually having well-rounded graduates. Curricula are planned according to the stipulation of the

NUC, but majority of the private universities have plans for more than just the minimum academic standard which would enrich the students morally, academically, intellectually and character-wise. In universities, curriculum planning, monitoring and implementation are done by the academic planning unit of each university that sees to the compliance of the academic policies of the regulatory body.

A vital reason for planning curriculum is to ensure that all thoughts, ideas and information required to pass knowledge unto the learners are reflected. It provides the direction for a larger goal. Curriculum planning needs a curriculum guide that acts as a lead to help in proper planning as well as guidance. According to Kolawole (2015), these are:

i.   A viewpoint declaration

ii.   Specific goal of programme

iii. Sequence of performance/indicators/objectives/outcomes

iv.   Content framework

v.   Yearly blocked plan

vi.   Assessment plan

Education programmes have intent, in other words,learningcapabilities are designed to complete aprecisemotive which is regarded as result. The degree of determination needs to be uniform with one another, which means aims must align with purposes. In the process of having reliability at all stages of planning, it can be very tasking. The curriculum guide developed; act as a plan for achieving results.

Knight (2003) as emphasised by O'Neill (2010) argued that, knowledge in different forms are difficult to pin to a particular viewpoint likewise the procedures might not be good enough for acquiring abilities.Knight further stressed that preparation for embarking on a task such as designing a curriculum begins with gathering all components needed to have a successful ending. He undoubtedly articulated the necessity for designing collective societal information. In addition, when a curriculum have elements of attracting learners, it would be effective in providing a learning environment for the society to experiment.

The approach used will help in providing an actualbasis for arranging what is being visualised, to have quality content preparation in our universities today. Ornstein

and Hunkins (2009, p.15) in O'Neill (2010) contended that, developing of contents (curriculum) can be translated to mean the way it is prepared for, carried out as well as the tools and methods used. They further stated that if there is a viable curriculum model, it will aid the developers to thoroughly figure out reasons for adopting certain procedures. Ornstein and Hunkins (2009) suggested that despite having laudable models, behaviours, attitudes and emotions were not part of elements being put into consideration when designing any curriculum. A good workable curriculum is that which is designed to make it possible, through its content, for a society to preserve and transmit its cultural heritage and also, render assistance requiredin modifying to accommodate the same, whenever new developments take place (Kolawole, 2015).

A good curriculum is also used to transform, reconstruct, change where necessary and improve the culture of the people through the process of education. Kolawole (2015,pg8) further stressed that a good curriculum should in content and design help the society develop its manpower through education and facilitate the process of a meaningful and practical instructional delivery and knowledge acquisition. It has become an obligation for education to develop its own manpower if the sustainability of the nation's manpower must be upheld. The development of its manpower through education starts from the contents or quality of what is being taught. Planning of such quality curriculum must be seen as the basis of the outcome of what end-product to be delivered. The planning of quality curriculum in Nigerian universities must be seen as the basis for the acquisition of what quality skills the students or graduates need to acquire to satisfy the demands of potential employers. If the planning is done shoddily, the implementation will also be poor and what needed to be achieved in terms of graduate employability skills will not be accomplished or attained.The curriculum development must have an organised and planned processes in terms of timing, training, know-how and reasonable costing; must be comprehensive enough to reveal what the society requires both locally and nationally; experts in curriculum must develop it in accordance with the global best practices and lastly, regular monitoring and reviewing of curriculumfor sustainability must be continually emphasised.

Kolawole (2015, p.46) identified participants in curriculum planning and development as the government, parents, professional associations, teachers, learners,

mass media, influential members of the society and the society itself. All these participants encompass what the student needs to be taught, that is the contents and what the labour market is looking for to eventually make such graduate employable after completion of a course of study.

In curriculum development, the content matters in order to forestall missing out the objectives of setting such curriculum, likewise the outcome of the learners and the skills that will make them employable in the labour market. According to Nicholas (2006, p.15) curriculum content consists of all the information to be assimilated, abilities to be learnt, andmoralsto be exhibited, designed for the purpose of being impacted on the students by their teachers.

Content consisted of all topicsand their extended form compiled according to what the students should be aware of fromthe known to unknown areas. This is also extended to areas that are of familiar terrain to learners of different classes having the hope to achieve some kind of unity; normally referred to as integration. Nicholas (2006) also identified three major sources of curriculum content to be the society, the learner and the subject matter in which other minor sources are subsumed under these three major ones. Quality curriculum content therefore, contains what is supposed to be taught, and what has been taught in the classroom which entails aims laid down by appropriate bodies as well as the output, which must be reflected in the ability of a curriculum that is workable (UNICEF, 2000). To be able to measure and ensure quality in a curriculum, it must be exhibited through its content, pedagogies, understanding of global perspectives and inter-cultural capabilities (UNICEF, 2000). Furthermore, UNICEF asserted that in all-inclusive perspective, what should be taught (content) must be in-depth and not broader; which means applying a funnel approach to cover areas of the curriculum that are germane in achieving capacitiesnecessary to function; the basis of this research. To buttress this, Glatthom and Jailall (2000) based their arguments on developing content that will facilitate the characteristics of each person involved, and carefullycombine the topics, as well as concentrate on grades, standards and student learning targets.

2.1.2.5 Monitoring of a Curriculum

Curriculum supervision entails every necessary step in the provision of curriculum and ascertaining whether these provisions are systematically expended. If the curriculum is not workable or something goes wrong along the line when it is being carried out, monitoring will provide feedback to the authorities in order to make amendments so that all the wrongs are perfected in the system. Italso involves the measures taken to find out if curriculum-in-use is appropriately and regularly implemented (Cape, 2008). Curriculum must be monitored in order to plan for a better future; to be able to allocate enough materials to accomplish effective teaching and learning; for continuous curriculum implementation; to expose staff to new development and innovation as well as determining proper assessment strategies for evaluation of students.The aspects of a curriculum that needs to be monitored include:

    i. Each subject;

    ii. Assessment procedures;

    iii. Partnership working; and

    iv. Extended curriculum provision.

The question still remains, which way the authorities (stakeholders) concerned in education will assist to convey the programmes developed?. For years, there had been the consistency issue in the curriculum to contend with. The process of having to put together the content brought about the genesis of how do we carry out what is being developed. The concept of curriculum monitoring is very essential and is regarded as the method to examine out of what is passed across as curriculum, what part is working and which part is not, so that it can be of benefits to the learners. The procedure seeks high quality and as a result, administrators can seek for the assistance of those that teaches in different subjects areas in supervision exercise. Curriculum monitoring may detect an effectively used strategy that is not appropriate for a programme or materials that is being used for.

Curriculum monitoring provides opportunity for staff development and also gives them the room to translate what is in the document into physical classroom exercise. When curriculum is monitored, it helps to identify the factors that can cause setbacks in the learning process in which authorities in charge can then proffer immediate solutionssuch as tools, assets among others. In monitoring whether the objectives set are in line of being achieved or not, the quality assurance comes to place in Nigerian

universities. Quality assuranceis a system in which both the delivery of services as well as the assessment of products is equated with the required, which gives room for accountability (Dirk, 2019). Every university in Nigeria whether public or private, must pave way for both the internal quality assurance as well as other recommended bodies outside the system.

The body that regulates quality within a system supposed to assess how adequate the learning objectives as well as the availability of resources provided for each programme by the universities purposefully meet the objectives (UNESCO, 2018). Articulating the quality regulatory body within a system with graduate employability in institutions of learning is essential. They are two considerable concepts when it comes to the employment of school leavers in job market. To integrate internal quality assurance and graduate employability, curriculum involving professionals; curriculum review and monitoring of the quality of internship and negotiations with managers in each discipline must be considered (UNESCO, 2018). These apply entirely to be the responsibility of the institutions or departments involved. This is done in partnership with the academic planning unit of each university or any other unit assigned to direct the adherence to the programmes with the objectives set in place. When the internally regulated body integrated certain culture into an organisation, and the procedures of management of the institutions, it is referred to as quality culture.

On the other hand, external quality assurance is done by the body that regulates the university system; the NUC. This is done majorly through accreditation which will show whether such institution is in compliance with the standard set by the regulatory body. Accreditation of the universities is more of a compliance issue in terms of implementation to meet up with the quality of the set standard. The Benchmark for Minimum Academic Standard (BMAS) is a document by the NUC, the body that regulates all the activities of private and public universities in Nigeria. In other words, it is a guideline that contains the minimum standards for every university to adhere to for their sustainability. The universities can go beyond these minimum academic standards in the various institutions being covered by it, but not less than the standard. In the same vein, the United Kingdom Quality Code for Higher Education (2012) acknowledged

quality assurance to include: quality academic principles and learning prospects; methodical improvement in curriculum as well as reaching the goal of the benchmark.

Finally, the European Commission Report (2013) recommended that the personnel that are involved in teaching, the learners, individuals that have completed their graduation requirements as well as the employers of labour, should be involve in all the stages of training the students. This report supported Nicholas (2006) while it was corroborated by Kolawole (2015) with respect to the various participants in the planning and implementation of quality academic curriculum.

2.1.2.6 Curriculum Reforms in Nigerian Universities

Higher education curriculum content and standards have become more and more international in the wake of globalisation of education, and are focused on producing professionals who can serve the ever changing modern democratic society within and outside their international boundaries (Msiska and Chulu, 2006). Due to the fact that curriculum had become the genesis of learning, it is strictly important to subject it to reformation which is a major focus in order to still retain its standardisation of all-inclusive.

According to Abbott (2014), there are different reform strategies that directly or indirectly influence the curriculum. These include requests forarrangement, ideas, assets, evaluation,and standardisation among others. Professional bodies, managers of organisations, governing authorities are contributors to curriculum content and its delivery system. These stakeholders rather than academics now largely determine curriculum content as against what prevailed for a long time. Higher education stakeholders accept that curriculum reform in structure, content, delivery mode, assessment and awards are essential to meeting the demands for increased participation. Others include, widening access to programmes, enhancing student mobility,employability without compromise to quality and standards, and without unattainable resource demand.

According to Msiska and Chulu (2006), in "Curriculum Reform and Quality Higher Education in the University of Malawi: A study of the current state of affairs with the objectives of establishing a baseline characterisation of the current curriculum,

assessing progress made towards curriculum reform in modularization and identifying scope for appropriate and timely curriculum reform. The methodology adopted was survey type and the findings showed that thecurriculum is specified with learning objectives, also, curriculum content and standards for levels of the curriculum are determined by a variety of influences, in which the major ones include: professional body requirements, academic staff experience, other higher education institutions and statutory body requirement, suggesting a traditional approach.

The responses suggest a need to keep on reviewing and aligning programmes and their curricula with changing times to ensure relevance. As far as the institutions of learning are concerned, a correlation must be provided between the amount paid and services rendered as the case may be in private universities.Peggy (2018) opined that for a curriculum to be successfully reformed there must be clarity in its objectives as well as consistency in its vision. Learners and instructors must be involved as part of designing and carrying out the curriculum that is to be developed. However, where problem lies is evaluation. That is, how the success or the process change is measured and what can be learnt from it.

Curricula are provided through organisations in which the university system is considered in this case. If decisions are to be made about how to change the curricula, there is need to understand the nature of such university, the conditions in which such university will embrace a change, and taking cognisance of the agents that will resist this change, what they are capable of doing and what will be left undone. It has been observed that reforms encounter various challenges from time to time and the rationale behind the large-scale reforms is economic rather than political (Morris and Adamson, 2010).It is interesting to know that curriculum has become an ideological battleground for competing policymakers for their own selfish interest. It is a battle between professionals who are the gatekeepers of education and policymakers. This will always call for a resistance to reformation in the educational system at any level.

A curriculum reform is a major task in any school system. Although, government as well as the school organisation can drive the reform agenda, different stakeholders might adopt entire different implementation strategies at different times. The different implementation strategies at different times will take toll on the curriculum as well as the

end-products the universities are looking forward to produce. In other words, there is bound to be variations in the products of these universities which will be as a result of different ways of understanding, interpreting, and implementation of the benchmark as well as the quality of the curriculum that transforms from the benchmark. These components will affect the types of graduates turned out into the labour market.Kennedy, Chan and Fok (2011), highlighted the failures of curriculum reforms that include:

  i.   lack of clarity of the innovations;

  ii.   schools and teachers lack of resources and support from government agencies;

  iii.   leadership problems;

  iv.   top-down model of change; and

  v.   the stress of public examinations in relation to university admission policies.

Policymakers often believed that 'while the road ahead was still a difficult one, there were some confidence that the reform agenda was achievable" (Kennedy, Fok& Chan 2006, p.118). Government should adopt implementation strategies which inclined towards a soft policy approach aiming at progression of schools and teachers in the context of a range of sufficient resource allocation but unfortunately, private universities cannot benefit from this.

2.1.2.7Implementation of Curriculum

This is the stage where the ''new'' curriculum is released for implementation; usually backed up with an enabling law to make sure its implementation by those who are expected to do so is uniform (Kolawole, 2015). It is a complete personnel development designed to give power to and certify that instructors are equipped with information required to teach and impact the demands of the curriculum.

Implementation becomes an articulated process found to be carried out between the authorities concerned as well as the teachers, and must be done appropriately. On the other hand, there have been reported cases of non-curriculum plan implementation which amount to sheer time wastage. Another issue is bothering on curriculum delivery. To have a successful curriculum, the plans must be implemented in the classroom in order to become impactful on target students. Curriculum can be laudable while the delivery process might be poor. To be able to teach what is documented as curriculum still proves

difficult considering added new ideas. These new ideas require systematic preparations and follow up.

Generally, there had been complaint of poor training among teachers that are supposed to carry out the immediate adjustment noticed. A university might have a laudable planned curriculum with quality contents but if the implementation is not properly done, there will be problems with the results or outcomes. Nigerian universities can have uniform quality curriculum contents but the implementation can be different due to certain contingencies. All the same, whatever manner the implementation takes, outcomes must be achieved positively.

Equally, if the curriculum is rich enough to have all the skills embedded in it and the teachers have necessary skills to teach appropriately with good pedagogies, the graduates would not have any problem with getting employed in the labour market.This is because, what is needed by the employees are already in the content being taught. On the other hand, if there is a problem with implementation in terms of facilities availability, staff or student ratios as stated by the NUC, the products of such universities might encounter problems of getting employed after graduation. This is the more reason for accreditation being carried out in all Nigerian universities to ensure conformity and it is a way of regulating standard and quality.

In this regard, Morris and Adamson (2010, p.183) argued that curriculum change and implementation in higher education was a reliance on symbolic policies which demonstrated scenarios of the government introducing a policy intention but not taking sufficient steps to ensure its implementation. Often, universities complained of lack of resources to carry out certain plans requested of them by their regulatory body. It is not uncommon to find public universities going on strike due to the government not fulfilling her part of the memorandum or agreement.

According to MinHo and Erry (2010) in Ornstein and Hunkins (2009) posited that making sure what is documented as curriculum is carried out demands teachers' awareness of trends of changes in their respective fields. Similarly, new information, actions and behavioural attitudes as well as new developments must be taking into consideration.They also made mention of implementation has been aninterpretative method, that showed how the use of assets in learning can change the viewpoints of

individuals. And lastly, acknowledged that bringing the contents (curriculum) into the classroom setting needs a lot of determinations and might cause a little bit of agitation on the part of the implementer. In order to reduce this, it is important to set goals that can be attained in a short term.

They acknowledged poor communication between different levels, deficiency in training, teachers' negative attitudes towards the curriculum contents, inadequate resources and insignificant funding allocation as limitations and obstacles to curriculum contents implementation. They also noted that, articulating guidelines on the part of the government as well as what happen in the school system are different things but teachers that are element in-between would carry out the intentions of the central authority. And lastly, there was an insufficient fund requested for curriculum construction which requires periodic meetings on the part of different stakeholders at different levels respectively. Sometimes, it often results in poor participation in curriculum implementation.

Sinnema (2009) developed a comprehensive method using different stakeholders from broader areas of specialisation. The author gathered data via categorisation of the schools into strata using discussion method, among 247 schools playing different roles. One thousand eight hundred (1800) responses were received in 176 schools. This was done with the aim of finding the kind of support educators received and how important they supposed the support, can help in making sure that the documented content is carried out successfully. Findings showed that educators' remarks suggested the need for prevalent approval of how the curriculum should be applied and the readiness to go about it.Instructors acknowledge how flexible the content can be at times, its appropriateness to information age, as well as the help given to schooling. In conclusion, respondents indicated that several parts of the content that are germane continued to be challenging inoperation.

2.1.3   Instructional Materials

Considering instructional materials as extremelyessential,mustreflect how adequate and its relationship in quality curriculum implementation. It takes different degrees, forms and shapes. Akpan (2005) referred to them as "Instructional Materials", and Okoro

(2011) citing Obanya (2002) in his perspective of terminology called them "Curriculum Materials" and "EducationalTools" respectively, as a result of giving room for students to learn in a better manner and enhancing the approach that the teachers applied in passing the information to the students. In support of this, Agun-Obu (2008) viewed the tools to be "EducationSupplies" thataidpupils to excel.

These tools are used to aid teaching so as to excite learning. They include books, pictures, cardboards, filmstrips, tapes, civicitems among others. These are information bearing tools specifically designed to fulfil teaching and learning objectives. Okeke (2005) described them as real and improvised resources (that can be seen and touched) meant to be used for enhancement of teaching and learning. In support of these views, Agina (2005) in Achimugu (2017) described the tools as what can be touched, accompany with producing sound, what can be seen alone without giving out sound as well as audio-visual. In corroborating Agina (2005) and Oladejo, Ojebisi and Isola (2011) termed the education supplies as devices that enhance teaching by making what is being thought more understandable. On the other hand, Afework and Asfaw (2014) reiterated that teaching and learning might not be visible without making reference to student textbook, teacher's guides' reference books and maps which enhance students' academic achievement.

In the same vein, Atkinson (2000) in Likoko, Mutsoso, and Nasongo (2013) , classified material resources as textbooks, charts, maps, audio-visual and other electronic instructional materials such as tape-recorders, television and video tape recorders while Lahina (2017) stated that the use of instructional materials in teaching science is very important because it provides a concrete basis for conceptual thinking which motivates people to learn and captures pupils imagination if used correctly.

Conversely, Adeogun (2010) found a connection that binds training tools with school achievement. The author concluded with the submission that assets owned by each school will determine their attainment in education.Adeogun (2010) also revealed almost non-existing materials in schools controlled by the government and that they are being deprived of necessary materials that can make teaching worthwhile.Eshiwani (1984) in Likoko, Mutsotso and Nasongo (2013) professed being able to facilitate good information and training with resources (subject teachers) must be provided to make the course

interesting. Muthamia (2009) contended by saying that, without suitable and appropriate resources, learners might find it difficult to get the best from their teachers due to not being able to be resourceful enough.Interestingly, these instructional materials in most cases are lacking and this leads to abysmal performance on the part of the teachers. The available resources are being over-utilized or ineffective and inother situations, some are obsolete. All these inefficiencies will have an effect on the type of graduate produced in the sense that, if instructional materials are not enough or unavailable as stipulated by the NUC benchmark, it signifies that such curriculum requesting for these materials are not qualitative enough and then the unemployed graduates are produced. It is not uncommon for employers to train their newly employees to suit their needs but the fact still remains that certain basic skills are expected from these graduates which must have been acquired while in school.

If the NUC benchmark regarding the placement of resources in schools are not met by these institutions, there is higher possibility that the curriculum in such areas will be adversely affected, which in turn will take an adverse toll on the category of school leavers being turned out. If teaching and learning processes are still regular traditional, not technically focused nor market-driven, there is a big problem with universities products. A resource in a nut shell is,any material and asset that can be used by individuals or group of individuals to work well. These resources may be considered to bepeople, concreteamenities and archival collections (NUC, 2007). UNESCO (2000) acknowledged that the essence of using resources to enhance teachers' methods is to have a reasonable outcome. The study carried out by Adeyanju (2002) revealed that, all the students going through processes of becoming a teacher and others that are already qualified attached benefits to the use of resources because it is about talking less and practicing more.It is also anything that has support and contributes in instructional process. In the same vein, Smith (1972) in Linkedln Corporation (2019) stated that instructional resources include all printed materials, facilities in terms of space and human resources. All these resources must be made available within the four walls of a school system and that to facilitate their optimum use, curriculum planners must be familiar with the various techniques for assembling, evaluating, and sharing formula for these resources. Similarly, Kimeu, Tanui and Alex (2015) also pointed out in a study that,

students' attainment in school was poorly impacted due to deficiencies in the provision of tools needed.

The main motive why students are taught in the classroom is to learn and when learning had taken place, attitudes of learners will change. This is done through adequate planning for achievable instructions taking cognisance of the materials to achieve this. Ishola (2010) referred to these materials as ingredients in teaching and learning which enhance students' academic performance as well as making teacher's explanations of ideas and concepts understandable. Instructional materials are very germane when it comes to proper implementation of employability driven curriculum. These include printed and duplicated materials, still and projected display materials, computer-mediated materials and technological instructional media. Others are visual, audio, audio-visual, electronic media, reagents and consumables for laboratories. United Nations Educational Scientific and Cultural Organisation (UNESCO, 2000), is of the opinion that materials that are printed-books alike act as ingredients to enhance learning of the students for maximum outcome. Hence, when materials are adequately planned and provided for, students will learn and acquire the skills needed to forge ahead in future. An example of this is where reagents are needed for science courses in the laboratory. If it is not available, it will impact negatively on the skills to be acquired. The students will find it difficult to acquire laboratory-based knowledge, needed for a holistic learning in the chosen field of study. In essence, instructional materials must be adequately planned for to be able toexecute properly the course contents. These materials have to be monitored and reviewed so that the obsolete instructional materials can be replaced with updated ones. Without the instructional materials being taking care of in the process of implementation of curriculum, development of employability skills will not be achieved. Obsolete materials cannot be used to produce new results. It is important to know that the quantities, qualities and adequacy of resources available to any educational institution will determine how such institutions will perform, in terms of the competency abilities of students required by people that will employ them after graduation.

The availability of these materials remains important for effective and efficient curriculum implementation; therefore materials must be adequately provided for. Bamiro and Adedeji (2010) asserted that resource allocation in higher education is among the

emerging issues in current literature. This is because many problems of schooling are related to allocation and utilization of educational resources. They stressed further that quantities and qualities of resources available to any educational institution will determine the success of such institution in producing employable graduates. They are of the view that perhaps, inadequate resources and inefficient utilization of the available resources could be the major factor responsible for this poor quality of graduates, which has consistently been at an alarming rate and had led to discontentment and disappointment among the education stakeholders in Nigeria. Isa and Yussouf (2015) acknowledged that these materials are used for specific purposes in teaching and learning processes. These include but not limited to: model designs; prospective offer throughdirectinformation; displaying of tested ideas; for technicalinnovative exploration; survey and abilities to develop logical approaches.

The resources can be combined or individually adopted to aid learning. Simply put, teachers' methodologies in the adoption of materials to aid learning are in various dimensions to reflect a permanent behavioural change in individuals. The study of Effiong and Igiri (2015) explained that instructional materials contribute significantly to teaching and learning process. These materials enhance students' memory in a period where everyone believes what is thought in school is only theory but not practical.Hakielimu (2008) and Laddunuri (2012) concurred about the inadequacies of materials to teach and learn that include textbooks, equipment among others. This can be attributed tonot providing enough means on the side of the authority concerned hence, limiting the students' attainment in the post primary classes.

Similarly, the adequacy of the instructional materials will determine the extent to which quality curriculum will be implemented in order to appropriately acquire stated goals in the curriculum by the students which is employability skills here. If the curriculum is laudable enough and there is no adequate instructional material, which is an ingredient to quality academic curriculum to carry it out, there will be difficulty in implementation. This does not matter whether it is a private or public university. The tools to be adoptedmust have elements of enhancing and providing a wide curriculum coverage as well as boosting effective execution. To this, Okoro (2008) observed insufficient materials in every science oriented curriculum. This curriculum

finalizessubjects, actions, ideas, and principles as well asdesires to be improved upon using materials.Many people are bothered about the outputs that are turned out every year form institutions of learning and still express great worries on the place of curriculum to the economic advancement of our nation (Babatope, 2010). The problem is also linked with the setbacks received from not having any sit tightset-ups (Muktar, 2007).

Anyakoha (1980) and Uzoezie (1992) in Okoro (2011) laid emphasis on insufficient tools to carry out science oriented subjects at stages of schooling. The preparation and adoption of resources for teaching learners cannot not be overemphasised, due to the benefit gained from assisting them to retain what is taught and learnt. In view of this, Mkpa (2005) opined that "Learners retain 20% of what they hear, 30% of what they see, 50% of what they hear and see, 70% of what they hear, see and talk about, 90% of what they hear, see, talk about and do."

The primary concern of education industry is to produce graduates whose training will be useful for individuals and societal development. Instructional strategies must consider learning and instructional materials at teacher's disposal to enhance learning. The learning tools also serve as support for knowledge acquisition like employability skills as the case may be in the tertiary institutions. The standard and amount of knowledge acquired by the students have often been said to be in consonance with instruction effectiveness (Abolade, 2010). This is the more reason for Abolade to have divided these materials into three major categories namely, printed, non-print materials as well as community resources.

He also went further to say that it can bebeneficial for educational materials to be well prepared and yet unsuitable for intended purpose due to the fact that the material has failed to demonstrate relationship between instructional objective and the capacity of the educational material. The way instructions are being disseminated in higher education, most importantly the university system has lost its values and this had contributed to not being able to function well in our universities. The plausible excuses for this problem are finance paucity, and unskilled personnel in using quality process to pass ideas (Ololube, Egbezor and Kpolovie, 2008; Ololube and Egbezor, 2009). Gisterea (2013) in corroborating this statement asserted that for fruitfulcompletion of learners to understand what they are taught, it iss pinned to the process of passing the ideas to them. What

makes up instructional materials in teaching must be consisted of all means of communication that can assist in supporting learningaccomplishments which can help in implementing the goals of curriculum in achieving skills required by the employers of labour.

Wambui (2013) emphasized that the amount of resources required will be determined by the number of students, and ensuring of adequacy of instructional materials means the science oriented subjects are more of learners' focused. Meanwhile Kosgei (2015) is of the opinion that resources are important in execution of curriculum and also helps in learning for integration purposes. At the same time, the resources provide the students with hands-on information.

Wambui (2013) stressed further that the quality of curriculum given to students rested on availability and sufficiency of instructional material, and direct what is taught towards innovative ideas in achieving stated abilities. Simply put, curriculum of these subjects supposed to reflect all the processes students must have satisfied in the bid to have the transferable skills.

Any process the students go through in school should equip them with necessary information in the subject area. Furthermore, Wambui (2013)'s opinion, on science classroom setting suggested that, it should not be deficient of materials required which can become a problem in Nigerian schools. If the teachers are not competent, materials would not be adopted. Its usage can be felt if the individuals concerned begins hand-on in which will definitely bring out the values. Onyeike and Onyeagbako (2014) maintained that National universities Commission (NUC), that centrally responsible in controlling all universities in this nation, should ensures that educational facilities such as textbooks, mass media gadgets, computers among many others should be adequately provided for so that the quality of university output can meet up with the world best global practices.

Clearly, attainment of goals of University curriculum needs the combined efforts of all individuals in the sections of the system. In order to maintain quality in all ramifications of such system, considerations must be given to economic and scientific resources likewise;university must increase its endowed chairs and professorships particularly in Nigerian universities.

2.1.4 Physical Facilities

In any school system, the quality of its physical facilities showed the egotism of the school and the admirations people have for its students. The quality of its environment in terms of facilities seems to strongly impact what is taught.To get value on how a facility will performance in any institutions of higher learning had become a matter of concern of education stakeholders. This is due to the fact that, there is the need to increase the provision and maximise the value for facilities. Hence, facilities in education are related to student's performance directly and vice versa (Vidalakis, Sun and Papa, 2013). Abbasi, Malik, Chaudhry and Imdadullah (2011) categorised school physical facilities ranging from electricity, toilets, physical structures, archival records areas, field where physical exercises can be carried out, rooms where experiments are done, which allows a school to function. Ayoo (2000) in Kapinga (2017) stated that areas where students are taught, furniture, where students can look-up for information as well as conveniences are vital to students'accomplishment. It is also assumed that, facilities have great positive impact on what is taught which in turn determines how well a student will perform.

Corroborating Ayoo (2000), Nirav (2010)referred to physical facilities as equipment needed for achieving educational knowledge. Nirav further stated that where the students learn, must be given priority and an adequate number of classrooms should be provided. Laboratory which is also an essential part of schoolshould be adequately equipped. Syakima, Sapri and Shahril (2011) stated that, various services are made available in publicly controlled institutions and these are identified as sitting areas for workers,careservices, and workrooms. The identified services must be sufficient in number and maintained accordingly (Ibrahim, Osman, Bachok and Mohammed, 2016).

Similarly, Akomolafe and Adesua (2016) also categorised physical facilities to include school building, where students can look-up for information, sitting areas for learners among others are believed toinspirelearners when it comes to learning. If institutions do not have adequate facilities that will match enrolment rate, the teaching and learning process may invariably be adversely affected. Ogunniyi (1982) acknowledged the part played by workrooms in using scientific procedures, the more reason for Adedeji (1998) to have mentioned that, sufficient supply of the amenities are as good as the school operatingimpressively. In corroborating their views, Adewunmi

(2000) showed a correlation of obtainable physical and students' accomplishmentswhile Ajayi (2000) emphasised the essence of providing enough amenities to help the instructors do their work better.

On the other hand, literature (Adeboyeje, 1984); Adedeji, 1998); Owoeye, 2000; Ajayi, 2002 in Ekundayo, 2010 submitted that, there is a positive relationship between school facilities and school effectiveness. In the same vein, Bakari, Likoko and Ndinyo (2014) explored the presence of impact of amenities on students' excellence in some government controlled institutions and the findings signalled that learners' accomplishments were better over a period of timewith sufficient resources. Also, schools with deficiency in what it takes to aid students' learning swayed with time despite new reforms to meet the societal expectation needs in Kenya. In Nigeria on the contrary, tertiary education in general are confronted with issues of not enough provision of capital to run the system, issues of not enough provision of capital, obsolete and almost non-functional structures and amenities, which have adversely affected the academic performance of students (Isa and Yussouf, 2015). Providing valued-facilities in adequate measures, allow for the intentions stated in the content of subjects realistic and that a direct relationship existed between physical resources and learning outcomes (Kenneth and Jeffrey, 2006) in Isa and Yussouf (2015). So, appropriate and sufficient valued resources are key elements in letting the learning outcomes are realised (Adeogun, 1999). In support of this, Odeh, Oguche, Ivangher and Dondo (2015) highlighted some facilities as supporting system for students' attainments in any learning environment as different structures, workrooms, materials needed to occupy open spaces for workers and learners' alike, sitting areas, where learners look-up for information among others. When these materials are provided, it will enhance how learners achieve their focus. (Odeh et al, 2015).

In addition, Akomolafe and Adesua (2016) statedthat, services and tools are not provided for generally in Africa and Ondo state in particular, and the facilities are poorly present, thus, influenced adversely how the students performed.Ndirangu and Udoto (2011) on the other hand, submitted that there is a reasonable matching idea among what constitute teacher's working well, students' accomplishments and making provision for enough amenities to integrate these factors. Owoeye and Yara (2011) using elementary

school pupils acknowledged that there is a nexus between how well the pupils performed and the services and tools available to them to learn with. The authors further showed that, providing comfortable sitting arrangement and spacious environment for the pupils improved their learning outcomes.Nevertheless, the buildings was not considered as an element that impacted how well a pupil will perform because according to Owoeye and Yara (2011), it has not been proven that when you expend more money on building an edifice in a learning environment, would contribute to how the learners will perform in the long run. Akomolafe and Adesua (2016) also agreed to the fact that, using appropriate amenities while learning will enhance the processes involved. If they are not available or inadequate, students might lose interest in learning and the learning outcomes will not be achieved which are employability skills. In a study conducted by Kenya National Examination Council (KNEC, 2010) maintained there were minimal attainment of literacy and numeracy skills which was attributed to acute shortage of physical facilities. It is important to note that inadequate physical facilities impact negatively on learners' achievement. Similarly, Khan and Iqbal (2012) acknowledged that, without provision of desired tools and structures in their measures for valuable learning, it will be difficult to reach the focus point. This is the more reason; they considered learning as difficult process which needs standardised buildings as well as classrooms with their facilities.

Also, Onyeike and Onyeagbako (2014) maintained that the National universities Commission (NUC) has a major role to perform in making sure those physical facilities such as libraries that are well stocked and workshops are adequately provided for in every University. Meanwhile, the NUCBMAS (2015) outlined the physical facilities that all the universities in Nigeria must provide for to ensure proper implementation of the programmes. These include: office spaces, classrooms, laboratories, lecture theatres, studios, resource rooms, workshops, auditoria, equipment and internet access. Others include: software materials, media services for instruction and research and libraries. The quality of output produced in the University cannot be stronger than the teaching and research environment provided in the system hence NUC in collaboration with government and major stakeholders should intensify their efforts toward the provision of educational facilities in which physical facilities is part of(Onyeike and Onyeagbako, 2014).

In the same vein, Oyedeji (2012) in Isa, Yussouf and Gwamna (2017) asserted that facilities provided for learning are reflections of the value attached to stages and processes involved, therefore, physical facilities need to be adequately provided and utilised towards student academic performance. Conversely, Uwezo (2016) noted that many children access primary education but the quality of primary education was found wanting. Poor outcomes of learning are driven by pressure from inputs which are also applicable to all levels of education in the country. On the other hand, Mackatiani (2017) stated that with inadequate physical facilities, effective learning attainment cannot be realised.

Education as a multifaceted practicemay be subjective to different factors in any environment which can be formal or informal. (Murimba, Moyo,Pfukani and Mtembo, 1995). The essence of education is learning and teachers must be actively involved; there must be textbooks and other printed materials, educational technology and physical amenities. Akomolafe and Adesua (2016) stated that these amenities consisted of school land, buildings, lecture theatres, furniture, workshops, schoolrooms, academic library, experimental rooms and other facilities that can inspire students to learning. Physical space is crucial for ensuring that students participate reasonably in learning activities. These facilities must be provided in order for the teachers and students to optimise their productivity. In any school system, university inclusive, physical facilities must be created in such a way to be useful in the manner that might be desired and also make positive contributions to learning (UNESCO, 1997). It is required because studies have shown that inadequate facilities impact negatively on learner's achievement (Mackatiani, 2017). Also, students will find it difficult to acquire knowledge needed for a holistic learning in the chosen field of study. However, Saeed and Wain (2011) asserted that availability of physical facilities impact significantly students' achievements. To neglect physical facilities in achieving the learning outcomes (employability skills) is a disregard to the physical hitches to be encounter in teaching and learning. Sometimes, instructional objectives changes, which can lead to changes in some physical structures of the school. Hence, physical facilities such as classrooms are very important and need to be provided for in order to be able to meet up with what the curriculum intended to achieve so that students can acquire the skills they are required of.

2.1.5 Human Resources

The term human resources was subsequently in use during 1910's to 1930's to promote the idea that human beings were an object of worth, that should be promoted to realise human dignity. This changed in the early 1950's as human resource management developed view of people as a means to an end for employers (McGaughey, 2018).Business Dictionary (2019) clearly stated that, those that work in organisations are sources of abilities and informationthat inspire others while Wikipedia (2019) defined manpower as individuals that work in organisations as well as the economy. Other terms used instead are manpower, talent labour or personnel.

Among scholars, the first use of human resources in its modern form was in 1958 report by economist Wight Bakke (Kaufman, 2008). Due to the misunderstanding that erupted among people given out jobs and those working for them, the concept gained in popularity couple of years later (Maughans, 2015). In higher education, human resources are people that are found to contribute progressively particularly to university outcomes. They are supposed to have required qualifications and skills, not just any but need to be highly skilled staff according to the National universities commission benchmark for academic standard (NUCBMAS, 2015).Akudolu (2010) opined that individuals are essential componentsthat assist in building a nation and that schools are not exempted.Similarly, Ekankumo and Kenebaradikumo (2011) maintained their views about how well the teachers competencies, values and improvement on the job from time to time can initiate the process of learning with the students.Competent lecturers that are committed to do their jobs will produce students who will be absorbed into the labour market and not only that, but also be useful for themselves as well (Unwin, 2015). It is important that students demonstrate the skills they have acquired to their potential employers before being offered a job. Blaxell and Moore (2012) on the other hand, asserted that academics must demonstrate and use all their skills and methods to teach the students so that students will purposefully develop their own skills and attributes. They further stressed that one possible way of doing this is through the use of high quality portfolio. This will allow the students to showcase their skills developed while in school and that the academics as well as curriculum designers must look into opportunity of providing the students to develop skills and attributes.

The type and strategy of organisation affects the human resource planning in the sense that if organisations are the types that promote its human resources, efficiency and quality output will also be promoted from the side of the workers (Onyeike and Onyeagbako, 2014).The NUCBMAS (2015) stipulated what the Nigerian universities personnel should look like in order to promote quality but amazingly, this regulation is not being followed. There appears to be enough personnel in some disciplines while other disciplines have to overload the fewer personnel made available to them by the university. This is sometimes attributed to inadequate funding to employ more hands.However,Bamiro and Adedeji (2010) are of the view that perhaps, if resources are inadequate and the available ones are not efficiently utilised, this could be the major factors responsible for poor quality university graduates. This has consistently been at alarming rate and had generated a lot of discontentment and disappointment among the education stakeholders in Nigeria. The NUCBMAS (2015) resource requirement for human resources includes:

Academic Staff:

These include the Graduate Assistant, Assistant Lecturers, Lecturer 11, Lecturer 1, Senior Lecturer, Associate Professor (Reader) and a Professor.

Non-Academic Staff:

These are the varioushigh-ranking experts in their fields, high-rankingsecretarial officials, and the support staff (low-ranking)

Human resources must be adequate to keep each department of the university up and running in terms of teaching and learning.Human resource as an essential indicator of instructional resources comprised of individuals with common vision working together to achieve common goals (Wikipedia, 2019). In education, the outcomes (employable graduates) from the school system become the future success of communities as well as the success of the socio-economic situation of a nation. The teachers and the support staff, likewise the students have so much to give into letting the goals of the university become reality. Considering this high stakes, it becomes necessary to dwell judiciously on the knowledge and strength of the education workforce to better serve the students. According to Hansen (2013), human resources are commonly presumed to play a key role

in school turnaround. Examples of human resources in education are the teaching and non-teaching of post-secondary institutions, principals, teachers and support staff of primary and post primary education as well as other special schools stipulated by the national policy on education. Human resources in this study, referred to the academic and the non-academic of universities in South-West, Nigeria. Academic staff in the universitiesare the lecturers that prepare students for learning activities and also make sure that the objectives pertaining to the instruction to be given are realised. Activities cannot be done in isolation without the help of the non-academic staff because their functions are interwoven. The NUC guidelines for academic standard stipulated the levels and qualifications of academic staff, requirements for promotion from one level to another as well as staff-rank mixes and ratios. On the other hand, the non-academic staff has three levels to fill in each department which include senior technical, senior administrative and junior staff. However, Runhaar (2017) emphasised that human resources management hold the key to enhancing students' achievements due to the role being played in the success train of teachers and students alike. When the welfare of individuals working in a University environment is not neglected, it will enhance lecturers' and universities performance. Students learning outcomes will also be achieved which are employability skills of graduating students.

2.1.6Methods of Teaching

Different school of thought had delved into the learning of key elements of methodical practices and skills as well as various ways of studying science nature (Stannovich, 2003; Grandy and Duschl, 2005; Proctor and Capaldi, 2005) in National Research Council (2007). There is a consensus stating science consists of conventional way of teaching as well as using already prepared workrooms manual that needs to be diversified.Science needs to be experimental, vigorous, and based on evidence (Handelsman, May, Beichner, Bruns, Chang, Deltaan and Gentile, 2004). They went further to say that, there is reluctant adjustment exhibited in the process of learning in which suggestions were offered in terms of manpower necessary, fund agencies and professional organisations. This is to expedite change on science education and make procedures and analyses effective.

Furthermore, Odom and Kelly (1998) and, Bartz and Miller (2005) stated that teaching presumption rested on teacher talk, textbook derived lessons, curriculum proficiency emphasis and the need to view students as passive learners with 'blank slates'. So a teaching presumption (constructivist theory) on information based results may support practices,and then incorporate actions that give room for investigation which is one of the 5 –E's of learning and supported by Blooms (Odom and Kelly, 1998, Spraque and Dede, 1999; Bartz and Miller, 2005).

Methods of teaching must be adequately planned, with a view that the best methods to teach the students are adopted. These are different ways in which a teacher passes the learning experience to the students. These include but not limited to Inquiry methods, oral presentation; open ended laboratory activities, and demonstration methods. The methods adopted must ne learners' needs focused. Teachers using these methods must make sure that methods are properly monitored to achieve the learning outcomes, if not, review is necessary in finding out what methods are working for the students and which ones are not. If the methods are not working, then the probability that the teacher will embraced the working methods is higher. The purpose of these phases is to make sure that the learning outcome is achieved, which are development of employability skills. Furthermore, research driven teaching methods must be all inclusive to achieve the learning outcome of the curriculum. The curriculum must be the type that must reflect students' core abilities to succeed in college as well as beyond (Forman School Centre for Excellent Studies, 2017).

In the same vein, Stanford (2012) opined that traditional system is where teachers used the lecture system for teaching science. The author noted that the drawback of this system is that, it does not make learning interactive. The modalities used for learning persuadea learner to repeatedly go over what is taught and concentrating on writing down what is dictated in the class rather than making science interesting. Stanford recognized some teaching techniques to include:

i) **Peer-Peer Teaching:** This method allows students to be engaged with members of the class. It involves a kind of procedure which inspires discussion on materials that are technical as well as facilitation of teamwork to learn new information.

Teamwork among students is a behavioural attributes that must be inculcated in their day to day learning in the classroom.

ii) **Current Events Tie-ins:** This method permits tying of recent events into science lectures and experiments. Teachers may use recent event while discussing oil spillage as it affects living and non-living existentialities. Other natural disasters such as tornadoes, hurricanes, earthquakes may be included in this type of discussion.

iii) **Hand-On Activities with Follow-Up Work:** This is a subtle way of exposing students to science. This encourages teacher to facilitate mixing of chemicals in a laboratory and plan and expand experiment in physics class as well as introduction completing a group project.

On the other hand, Schroeder, Scott, Tolson and Huang (2007) revealed during analysis of their study, that six categories of teaching strategies to include: i) Questioning (0.74), ii) Manipulation (0.57), Enhanced materials (0.29), Inquiry (0.65), Collaborative learning (0.95), Instructional technology(0.48). The inference drawn from the study indicating that effectiveness of alternative teaching strategies in science was generated. LinkedIn Corporation (2017) explained some strategies of teaching to include:

i) **Inquiry approach:** To use this approach in teaching science, a teacher needs to organise activities that will allow students to develop some tasks such as, a) recognize challenges b) make enquiries c) apply laboratory procedures d) provision of steady clarifications. Procedures in using probing method include i) carrying out different tests b) application of gained abilities must be focused on. The 5- E is another approach that can be used for promoting systematic analysis. This 5 –E stands for Engage, Explain, Explore, Elaborate and Evaluate.

ii) **Incompatible occurrence:** This involved unpredicted or inconsistent occurrence which is pinned to the emotional undertone of individual learner. This is done through reflecting teaching as strategies for scholarly write-up (Salandanan, 2008).

Other strategies of teaching science are: equal participation, lecture and students' recitation, simulation-modelling, a real life phenomenon, field trips, concept mapping,

problem-solving methods, inquiry activities, reflective teaching and micro-teaching (Marzur, 1997; Hake, 1998; Feynman, 2001, Wieman, 2005).

The National Research Council (NRC, 2013) in the United States of America, advocated for shifting from textbook style to hand-on experience but not only hands-on but minds-on as well which is behavioural attributes acquired through quality curriculum in the university system. This is to prepare graduates for job opportunities as well as maintaining the jobs they acquired. The NRC (2013) also suggested other strategies of teaching science to be Inquiry, Guided Inquiry, Discovery/ problem solving method, open ended laboratory activities, and analysis of result of activity, cooperative learning and field trips. Since procedures involved in getting information desired can be by investigation, which may also combines thoughtful reflections guided by critical thinking skills (National Academic of Sciences, 1995; Chip, 1997 and Martin, 2000).

The methods of teaching is like Howard Gardner Multiple Intelligence Theory which states that, instructors should be able to make judgements when combining different topics, explanations, assets and schools of thought, so as to achieve desired results (Bartz and Miller,2005).

2.1.7   Assessment Strategies

Assessment is a critical part of learning process required to gauge performance against instances of learning outcomes and determining appropriate progression to the next level (Oxford Brookes University Centre for Teaching and Learning, 2017). Assessment will be meaningful in learning process if the result of assessment being used and followed up correctly by teachers (Mushon, Lestari, Supriyanto and Baroroh , 2015). It is more than a test of final learning process, and so has to be integrated part of a learning that is capable to inform, guide, and increase the learning the learning result of students(Purnomo,2013).

This is appropriate with Pantiwati's submission (2013) in Irwanto, Nugraheni, Puspita, Astuti and Prasentyo (2015) as explained that, assessment is capable to increase student's cognitive ability in school so that learning process and result assessment are two components that cannot be separated. Learning result assessment aims to evaluate the

student's result attaining, thoroughly from cognitive dimension (Knowledge), Affective dimension (Attitude), and psychomotor dimension (Skills), (Irwanto et al, 2015).

Similarly, Queens University LearningCentre (QULC, 2015) in measuringwhat the process of valuing how well students' are doing, concluded that, it is a significant component for teachers and students alike. These entail components such as essay, portfolio, tests, performances, presentation, proposals and many more. In the same vein, Science Education Resource Centre (SERC, 2019) opined that assessment needs not take time away from learning rather it must involve learning experiences. Dynamism in the process of knowing how well the students are doing in their learning, can stimulate the best way of assimilation that will showcase their capabilities for future use. However, Yorke and Knight (2004) asserted that assessment methods sometimes are not coherent with curriculum that is employability sensitive and that assessing employability is essential if the problems of technicalities are to be resolved. Dynamism in valuing learning process, brings about being able to interact with other students very well (teamwork), opportunity to weigh how learning process becomes advantageous in the future, and makingprogressin the accepted manner of scripting (oral and written reports).

SERC (2019) identified ways to assess students learning to include: i) Scoring rubrics' (Letter grades) which assist students focus on content; ii) Instructional rubrics' to teach students skills on a body of evidence; iii) Concept maps which gives the students ability to draw reasonable inferences from observations; and iv) portfolios that improve student metacognition.

The process of valuing how well students have done so far with learning and the quality of curriculum can be improved through i) employing a dynamic valuing process that will match the aims of studying ii) stating clearly all the contents learners are supposed to be worked through and iii) mapping out the strategies that will allow the learners to be aware of how well they are performing (QULC, 2015). The main purpose of assessing students' work is to encourage them to have uninterrupted learning, and to guide against any response that can reduce their inherent drive to study.Teacher must therefore, strive to be fair and consistent when assigning grade to a student's work.For instance, in science-based disciplines, more of observation, demonstrations, laboratory reports, research reports and presentation are being used which are formative in

nature.These assessment strategies must be adequately planned for, monitored very well to be sure that it measures what it supposed to and reviewed on the need basis so that the learning outcomes which are employability skills can be developed.When students are assessed properly, they will be aware of their strengths and weaknesses and where they need to brace up as well as what skills had been achieved by them.Assessment must centre on educational outcomes that matter most, not just on those things that are easiest to test and quantity.The goals should be the incorporation of principle for effective classroom assessment. One of the learning activities that can train students to develop their three competencies is practicum activity in the laboratory (Sunyono, 2008).

In the study of Ferris (2010), a reasonable observation was madeconcerninglearner's performance at the laboratory with the written assessments including laboratory reports. The performance difference indicated practical work as a different competence domain than other assessments. This observation provided practical appreciation, although nothing more formal of the division of educational outcomes in the areas of reasoning, emotional as well as useful talents (Krathwohl, Bloom and Masia, 1973; Bloom, Engelhart, Furst, Hill and Krathwohl, 1979). Practicum activity requires process skills' approach, because through skill process, students can discover and develop the fact, concept, and scientific skills (Jelita, 2013).

In support of this, Subali (2014) explained that the learningmethod abilities are mental aptitudeswhich are valued by employing manual investigations. Clarification question is a type of written test in which difference students' process skills in science are measured (Fatmawati, 2014). The 21st century is a new era of science development in every sector. Analytical thinking skills objectively include various science process skills aspect and science practicum learning in the laboratory. This is because laboratory activities are effectively able to develop intellectual ability, scientific enquiry, and students' skills in solving problems (Hastuti, 2014).

Learning has to be a temporary or permanent change in behaviour and this change in behaviour includes all aspects of behaviour if someone learned something, he or she will experience behaviour changes through attitude, skill, knowledge and many more. The 21st century is a civilisation that needs competency to interact with other people and

work in a team. In the world of education is development of technology and science that needs to be supported by adequate skills.

Irwanto et al (2015) explained that the main skills that are on the rise as prerequisites to have a job in this age are:

i.   Good expression (communication);

ii. Being able to proffer solutions in difficult situations ;

iii. Working together to bring out good ideas (collaboration);

iv. Creating useful ideas

v.   To be able to breakdown a whole into components (analytical).

Biggs and Tang (2007: p.23) in their book titled " quality teaching and learning in higher education" suggested that there is an alliance connecting processes involved in learning, valuing what has been learnt and future results, as inner theme in improving students'knowledge. The themes in steadiness and alliance in curriculum design are reiterated by literature (Ramsden,1992); Steffe and Gale, (1995), (Laurillard, 2002), by stating that specific focus should be influenced by dynamic value attached to what has been learnt, so as to encourage the learners (Boud, 1995; Toohey, 1999; Gibbs and Simpson, 2005).

Other scholars however suggested that though universities may wish that their students perform better but the practices involved in valuing what has been taught still not give room for such intentions (Boud and Falchikov, 2005). Bryant and Clegg (2006) are of the opinion that rather than the value processfocusing on improving and accessing judgements, it is based on what an individual knows and the amount of information one is armed with. There are two major ways in which students are assessed in Nigerian University system which is supported by the National Universities Commission Benchmark for Academic Standard. These include both formative and summative assessment strategies.

2.1.7.1Formative Assessment

Regier (2012) defined foundational assessment process as what forms the basis of other processes in using of evaluation techniques to acquire learners' information on how they have done so far with their learning. It is the responsibility of the teachers to put together

all that are necessary or required to be of benefits to learners. They must also tailored them towards what has been stated for achievement in the curriculum which is learning outcome in terms of skills needed to be acquired. The essence of this assessment is to make the learners to be conscious of how far they have gone when it comes to skills learnt and what still remains to be achieved.

Foundational assessment activities offered reactions and evaluate scholarship progress to motivate students to higher levels (Queens University Learning Centre, 2015). The concept is an essential part of teaching and learning and does not contribute to the final mark given for part of the course unit taught (Villannueva, 2015).Equally, Carnegie Mellon University (2016) opined that the objective of the formative assessment is concerned with checkingfrom time to time the learners' performance, by providing reactions at all times to enrich the learning process.

Foundational assessment:

i. assists pupils in identifying what they are good at doing and what they are not;

ii. assists the tutors in recognising areas that learners needs to try more.

According to Aranas (2017), techniques use in evaluating learners must address the three major areas of learning (stated by Bloom) and that combining these areas must yield fruitful results.

These are some formative assessment strategies that can be used:

i. Observation

ii. Questioning/Interviews

iii. Discussion

iv. Checklist

v. Demonstrations

vi. Visual Representation/Concept Maps

vii. Peer/Self-Assessment

viii. Student Practical

ix. Questionnaires

x. Problem-Solving

xi. Laboratory reports

xii. Research report and presentation

Regier (2012) reinstated that approaches used in measuring how well learners had performed are applicable as a link between what is taught and gained, and also the final outcome of such learning.This method can be employed while teaching and when feedback is given, brings about new approaches to perform better.The use of this kind of measuring process is expected to give those that engage in teaching ideas related to their students' learning. Instructors' sometime need to re-assess their teaching processes and approaches use and thereby device another at a later time if the impact are not felt by the students. Results of this kind of measuring system drive instruction and it is about student involvement.

In addition, this type of approach in assessing students can also be employed by learners to facilitate their efforts in realising the results needed. When it is incorporated through practices, it will bring about fresh thoughts on changes needed in what is taught and learned. It is about student's timely adjustment to changes in the learning situation (Garrison and Ehringhaus, 2011). In achieving the focused outcome over a given period, adaptability is a key factor. Exhibiting change in the process of acquiring knowledge might help to master curriculum outcomes.

2.1.7.2CumulativeAssessment

Cumulative assessment has to do with the degree to which a learner was able to meet all the prerequisites employed in knowing how well such learner must have performed a school unit (Villanueva, 2015). This is also used in quantifying achievement, reward achievement and means for data selection. It also provides ideas on the difficulties facing the students in the process of learning.

Queen University Learning Centre (2015) considered this type of worth of being educated as what provides the end results based on capabilityand or accomplishment. The Centre acknowledged concepts tests- multiple choice questions, knowledge survey- a survey of course content, Exams- quizzes, tests, exams, oral presentation, peer review, written reports to be summative assessments. In the same vein, Gadbury-Amyor (2012) sees the objective of summative assessment as evaluation being carried out using a criterionat the end of completing a module which can be mid-semester, long essays.These

garnered ideas can also be applied as foundational in the process of other modules to be taken in the near future.

In corroborating Gadbury-Amyor, Oxford Brookes University Centre for Teaching and learning (2017) identified essay, assignment, individual projects, group project or assignment, Dissertation, Examination, Viva and peer review. Measuring the valuing process of students learning are carried out from time to time for the purpose of finding out the aspects of learning they are able to cope with as individuals at that period. Some schools of thought believed that, measuring how far students have been performing can be visualised from the items given to them. This is to find out the level of information the learners must have gained owing to their relevance to classroom programs (Garrison and Ehringhaus, 2011). Classroom assessment can be relied upon to be used for knowing the worth/value of what students have gained. This appears endless, as Garrison and Ehringhaus highlighted assessment as:

i.   the reviews carried out by the authority in a state

ii.   provisional yardstick for determination of value

iii.   review attempted by providing answers to some question items by learners, after the content is partly completed

iv.   writing of elaborate papers after the entire content is exhausted

v.   giving of marks to show learners examination records

In corroborating Garrison and Ehringhaus, the Glossary of Education Reform (2013) explained that finding the worth of a student through the abilities gained after being taught, is a necessity which constituted what must be acquired at the end of a program. It went further to explain summative assessments based on these criteria:

1.   the outcomes are regarded as marks which are faceted students' result spread sheet components;

2.   when contents are completed, and the types of assessments being used in evaluating the extent of students' learning. This is useful in knowing how a particular course of study is achieving the stated aims.

Classroom assessments include:

i)   End of unit or chapter tests or mid-semester tests

ii)   Semester finale review

iii) Finalecourse evaluation

iv) Portfolios of student- projects

It should be noted that universities embrace some yardsticks in observing how well students learn and were taught,which the curriculum is drawn from. It also determines whether they are on track of understanding content materials to be judged with after being taught. The idea of investigating the extent of learning can be employed as foundation for further adjustments to approaches used as construed by people engaged in mentoring of the learners.

The National Universities Commission Benchmark for Academic Standards (NUCBMAS, 2015) also has its stand on this by identifying what summative assessments are made up to be:

i. Attendance and participation

ii. Quizzes

iii. Tests

iv. Assignments

v. Mid- semester examination

vi. Final semester examination

vii. Final projects

These must be fulfilled before a class of grade or degree can be awarded to a student which will indicate that the students must have been aware of the goals of the course of study in the university and must have had the knowledge of them as well as the the ability to demonstrate what they have learned. Classroom assessment is germane and remains tenable way of measuring activities of learners in relation to the yardsticks given.

The two main types of assessments (formative and summative) that constituted the basic collection of measure of materials, must structure very well, and prompt adjustment to be applied when necessary (Garrison and Ehringhaus, 2011). According to Oxford Brookes University Centre for Teaching and Learning (2017), assessments used in Nigerian institutions were imitative of British ideas, which did not focus on the benefits students' will derive from formative assessments but on having more scores.

In the case of this research, the learning outcomes are the employability skills possessed or acquired by the graduates. If the assessment is according to the objectives

set to be achieved, the learning outcome will be positive and vice-versa. When students need to check their scores after a certain examination, it usually creates worries for them. Some of them do feel bad sometimes due to the scores attained. They also see their scores asthoughts for the need to push harder in their studies. Evaluation of student work is more than assigning grades rather it entails explaining teacher/students worth, and sharing information with one another in an exciting manner. Therefore, the objective stimulates uninterrupted learning and avoid ruthless feedback (University of Southern California Centre for Teaching and Learning, 2009 pg1M 4.4).

According to Boyet (2012), evaluation is a process that contains a series of steps to establish objectives; classify the objectives; define the objectives; select indicators and compare data with the objectives. Comments are to inform students on ways of ensuring future improvement which will be of many advantages to the learners.University of Southern California Centre for Teaching and Learning (2009) suggested that:

i.   Comments may justify and explain the assessors' chosen grade. In a situation whereby students perform below the expectation, he/she reserves the right to question the grade unless there is side comment made by the examiner.

ii.   Comments are important because they allow the students to get reaction for continuous positive modifications. They will also become aware of changes to attain standards through course.

iii.   When comments are properly laid out, it may stimulate students to perform excellently in future endeavour.

2.1.7.3 Grading System in Nigerian Universities

The grading system is a way of evaluating what the students have learnt in terms of continuous assessments which include quizzes, tests, assignments, mid-semester examination and the final examination. As the case may be, in the field of sciences and basic medical sciences, it can include practical projects as well as clinical studies.

The Director of Academic Planning, University of Ibadan observed that all grading systems have Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA). The grading system in use in all universities in Nigeria is a five-point grading

system, except for University of Ibadan   that is still using a seven-point grading system which has been in use since the inception of the university.

He further stated that currently, the issue of a seven-point grading system is been addressed. In United Kingdom, it is 4.0 grading system and in United States of America, 5.0 grading system is in use. University of Ibadan authority noted that the graduates of the university who travelled abroad are having problem with getting admission abroad. The NUC benchmark grade point is 5.0 and the policy is being reviewed so that University of Ibadan graduates can be competitive when they go outside Nigeria.

The one time examination that takes the bulk of the marks is also being looked into. Interestingly, the NUC is not looking at this area, yet the standard should be between 30 and 40 per cent. Discussions are on -going because if a student is ill during an examination, the students' performance will be affected which implies that such course becomes an automatic carry over for such a student which should not be. He concluded by stating that this one-time examination also gives room for "**la cram, la pour, la forget**" in which the knowledge that is supposed to be impacted on the students does not have any positive influence since they cannot recall anymore what was crammed just to pass or get a good grade.

Some employers of labour are so particular about the class of grade that a prospective employee made from the university. In the university system, for example, graduates given priority for employment after their service year were those that had a 6.0 from 7.0 point grading system and in 5.0, must have had between 4.5 and 5.0 CGPA, which is a first class grade.In other words, the benchmark grading system can be stated to have effect to some extent on the employability of a graduate. At the same time some, employers will not consider the grade or class of graduates but will be particular about the skills acquired by the students while in the university.

Table 2.1 Approved scoring and grading by NUC

(i) Credit Units	(ii) Percentage Scores	(iii) Letter Grades	(iv) Grade Point (GP)	(v) Grade Point Average (GPA)	(vi) Cumulative GradePoint Average (CGPA) Multiply(i) and(iv)/TCU for courses registered till date	(vii) Class of Degree
Vary according to contact hours allocated to each course per week, semester and according to student workload	70-100	A	4	Derived by multiplying i and iv and dividing by total credit units	3.5-4.0	1st Class
	60-69	B	3		3.0-3.49	2ND Class Upper
	50-59	C	2		2.0-2.99	2ND Class Lower
	45-49	D	1		1.0-1.99	3RD Class
	0-44	E	0		<1.0	Fail

Source: National Universities Commission approved guidelines for course system and grade point average in Nigerian universities. Revised October 2015

Table 2.1 presents the scoring and grading system as given by the NUC Benchmark. It is a four point grading scale for classification of University degrees in Nigeria. It shows how the Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) are calculated after the completion of a programme to evaluate the appropriate degree class any student. It should be noted that any student whose CGPA is less thsn 1.0 shall not be awarded a degree.

2.1.7.4 Continuous Assessment

Continuous assessment is the educational policy that created standard of measuring students' performance continuously over a period of time (Wikipedia 2016). The Director Academic Planning, Redeemers University explained in the interview conducted that there is a new academic standard called the benchmark and the academic curriculum has to be in conformity with it. This has been in use since the inception of the university, it is applicable to every university in Nigeria; and it is likely to still be in operation for sometimes. Conformity to the NUC benchmark must be the watchword of all universities in Nigeria.

Each learner is assigned with certain credits' unit at the completion of the subject matter (semester finale). Examinations take the structure of written papers, oral examinations, practical, submission of projects, assessment of course work, or a combination of these. The Director of Planning, University of Ibadan added that NUC recommended benchmark for continuous assessment is between 30 and 40 per cent.

The grading system in the universities is not an "almighty June "that was used in the past because it is believed that assessment should be tailored towards the philosophy of student's learning outcome. It is not a failure; it is a test of whether or not teachers are doing the right thing. When multiple assessments are given, one would be able to know the state of knowledge whether or not learning is occurring or has taken place. Pedagogical training is very important here, the syllabus is compulsory, in it the teachers are expected to have more or less spelt out what is required for the students so that they will know what they are offered and how to get the good grades. Most individually as well as government owned institutions, now give more push discouraging having just one mid-semester test to serve as continuous assessment. Continuous assessment has different modalities; it can be open book assignment, group discussion that will add up and other forms.

Continuous assessment constitutes 40 per cent of the total score for a course that does not involve practical and for courses that involve practical, it is 60 per cent, in some private as well as public universities. This varies from institution to institution in the sense that some will make continuous assessment 30% and the examination will be 70

per cent. In some universities abroad, continuous assessment can attract a score that will be up to 60%,while examination will be 40 per cent.

A Typical Continuous Assessment:

Class attendance and participation	5%
Quizzes and Test	10%
Assignments	10%
Mid-Semester	15%
Final Semester Examination	60%

In some other private universities, students are assessed based on combination of the following methods:

i.   Unannounced quizzes

ii.   Class Examination

iii.   Homework Assignments

i.   Mid-Semester and Final Examination

No percentage is awarded to any of the criteria. Each college/school/faculty decides what percentage to be allotted to the continuous assessment. Sometimes the teachers are to use their discretion in allotting percentages to each of what makes up for the continuous assessment.

Some of the grading system in place at the universities has to do with the issue of review and NUC guidelines. Through the review and putting the environment into consideration, that is the Nigerian space, uniqueness of institutions comes in and in the bid to create a mark for each of the university, this informs the grading system to put in place, which the NUC will review and affirm the appropriateness or otherwise.

The grading system is very important to any university as well as the students because this is what determines what class of degree a student will graduate with. The fact still remains that there will be a need to conduct an employer's rating in finding out the correlation of quality of the turn-out produced these by universities with different grading systems taking cognisance of the components of the grading system to degree class attained. A graduate who came out with a first class grade should be able to exhibit first class quality.

Meanwhile, it has been observed that some graduates cannot defend the class of degree awarded. This has nothing to do with whether a student finished from public or private university. There are other factors responsible, such as attitude of parents towards education and social economic status of parents. Chansarkar and Rautroy (2006) noted anexisting positive relationship of scores received after taking a test with scores in cumulative class activities. Thus, classroom activities assessment could be described as means of helping students to improve their grades.

2.2   Empirical Review

This section reviewed the research methodology and the findings of authors that were conducted on the dependent and independent variables such as instructional materials and employability skills; physical facilities and employability skills; human resources and employability skills;Methods of teaching and employability skills; assessment strategies and employability skills.

2.2.1   Instructional Materials and Employability Skills

Ezenwa (2018) conducted a research that assesses how learners in the lower classes of post primary schools were taught using learning aids in Imo State. This was used considering French content (curriculum) so as to be able to improve upon the learners' communication skills. Only 360 pupils and 15 teachers from 20, 384 junior secondary schools where French is offered as a subject were randomly sampled. Two types of instruments used were made of 10 items each. Percentages, tally ratings and differentials were employed in analysing the data. Findings showed a provenvariance of instructional materials for teaching secondary school curriculum for French in different schools and that different instructional materials used to teach French such as textbooks brought about the acquisition of language skills for communicating.

Adebayo and Adigun (2018) carried out a survey in Nigeria on the impact of instructional aids on students' academic performance in physics in secondary schools in federal capital territory at Abuja. Aim stands to examine the availability, application,the impact and the extent it can be obtained to improve students' academic performance in physics. Descriptive research survey was used and 3,150 post primary senior schools with

their teachers (163) were sampled. Questionnaire used for students contained 60 items while that of the teachers has 15 items respectively. Data analysed with frequency counts and percentages. Study showed a proven variance in academic performance of students which instructional aides were used to teach them. Shortages of instructional aides were also shown.

In a study conducted by Nartey (2018) using descriptive survey design investigated instructional materials and students performance in physics in senior high schools of cape coast metropolis, Ghana. The population was the science students and physics teachers in the metropolis. Only 160 science students and 13 physics teachers were sampled. Instrument was questionnaire. Data analysed with frequency counts and percentages. Findings showed that the extent of usage of all the instructional materials is very high except the projectors and the laboratories and that teacher revealed that all other instructional materials are adequately used. The extent of using relevant instructional aids correlates with learners' attainment in physics.

In the study of Lyimo, Too and Kipng'etich (2017) on perception of teachers on availability of instructional materials in some schools district in Tanzania, utilised descriptive research design using both quantitative and qualitative methods. Only 318 respondents were randomly sampled from the total population of teachers (1049). Frequency and percentage were employed to analyse the questionnaire data while interview schedules were analysed through thematic approach. The result showed that supplies printed were not enough as well as the geographical learning aids. This is as a result of not being able to match the quantity of supplies with progression in the number of learners which can also automatically affect the academic performance of the students.

Adedeji and Oyebade (2015) in British Council report on Graduate employability in Nigeria: Thoughts, travails and tactics using both qualitative (interview, student focus group) and quantitative data. A total number of 1,036 students were randomly selected for questionnaire administration across the three universities selected namely: University of Ibadan (517 students), Imo State University (240 students) and Bingham University (270 students). Seven faculties were covered (Arts, Education, Science, Agriculture, Social Sciences, Business Management and Law). Majority of the students interviewed were full time, and 57.7 per cent were females. Data were analysed using mean score and

chi-square while the rest also analysed thematically. The findings showed that, in the process of producing an ideal graduate, some skills are missing in the work of some faculties/departments. Such skills include reading skill, language skill, and practical skills among science and engineering faculties. Inadequacy in acquisition of these skills were attributed to lack of reading materials and culture of reading, poorly equipped language laboratories and workshops. These in one way or another did affect the production of employable students. In addition, the curriculum of the universities is also out-dated and not comprehensive enough to enhance graduate employability skills.

In a study conducted by Arop, Umunah and Effiong (2015) investigated the effect of instructional materials on teaching and learning in Oju local government area of Benue State. Survey design was adopted using questionnaires for students and teachers. Only five (5) schools were sampled combining all the subjects (100). Chi-square with percentages was used. Study showed a substantial correlation between what is taught and learnt in one of the subjects (social studies) and the importance attached to the competency of the teachers, handiness of the resources and their applicability.

A study conducted by Omoebe and Akanni (2015) in Ebonyi State, Nigeria, dealt with effect of instructional resources on students' achievement both in physics and chemistry at post primary senior colleges. It was to determine in physics, what effect resources would have on learners' attainment.Quasi-experimental design was adopted. Four (4) post primary senior colleges were randomly sampled. The study also used intact classes. These four colleges were categorised into controlled (2) and treatment (2). Physics achievement test (PAT) was the only instrument used. Mean score, standard deviation and ANCOVA were adopted. Findings indicated physics students educated with instructional resources attained greater and better marks than the other students taught without instructional resources.

Aina (2013) conducted a research on the uses and improvisation of instructional materials and the implications on teaching and learning of physics in secondary schools in Kwara State. Descriptive research design was used. Questionnaires were adopted having 64 items and run through physics teachers (23) and their students (39). Data analysed with percentages and frequency counts. The study showed that, teachers made

use of the tools they can produce locally, due to not being able to get the original ones as well as the ones that are obtainable cannot be used as expected.

2.2.2 Physical Facilities and Employability skills

In the study of Lyimo, Too and Kipng'etich (2017) on perception of teachers on availability of physical facilities in some schools district in Tanzania, utilised descriptive case research design using both quantitative and qualitative methods. Only 318 respondents were randomly sampled from the total population of teachers (1049). Frequency and percentage were employed to analyse the questionnaire data while interview schedules were analysed through thematic approach. The findings showed that there are not enough spaces to accommodate the amenities needed. No cross ventilation in the sitting areas meant for the students. This translates to the fact that when amenities needed are not provided, students' attainment is negatively affected in the area being considered.

Maingi, Mulwa, Maithya and Migosi (2017) investigated how well learners were disciplined by the amenities they are exposed to at the government controlled colleges in a region in Africa. Research design was descriptive in nature and sixty eight (68) principals, three hundred and fifty (350) teachers as well as three hundred and eighty (380) students were randomly sampled by strata. The use of questionnaire, observation and scheduled interviews with key informants wereengaged. Analysis was through frequency counts and inferential method that is correlational in nature. Findings revealed a substantial connection of how well learners are disciplined to sufficient provision of college amenities.

Mackatiani (2017) conducted a study on the influence of physical facilities on quality of education in Kenya using mixed method approach (quantitative and qualitative approaches). The study design was descriptive using questionnaires (two types) and an observable schedule. The population comprised of 800 primary schools. Using Krejcie and Morgan (1970) sampling guide, 36 primary schools which involved 36 head teachers and 144 class teachers were selected. The total number of sample size was 180 while data analysis was done with means, frequencies, standard deviation and regressions. Findings

showed the valuedtraining executed was determined by how obtainable the amenities are, likewise the level at which they were preserved.

Shad, Khan, Khan and Khan(2013) investigated the essence of having a valued training in elementary schooling at Khyber Pakhtunkhwa.Employed descriptiveresearch method. One hundred (100) school heads, and their three hundred (300) instructors were randomly sampled. Questionnaires of two types were engaged as instrument. Inferential analysis was used in the work. It was revealed that college amenities such as qualified personnel,spaces in the sitting areas for learners were enough while the siting areas for the workers, areas where students look-upfor information among others were adequately obtainable to a substantial category. So also, the elementary schools did not have a designated room for giving first aid treatment to children whenever they sustain any injury while in school likewise workstations to improve on the literacy level of pupils.

Anifowoshe and Lawal (2013) investigated the level at which higher institutions possess physical amenities. The work was done in Nigeria and the population constituted of thee students fromfederal University of technology. Collection of data was done using questionnaire and data analysed with frequency counts and regressions. Findings showed the level of amenities is inadequate.

Sawyerr and Yusof (2013) investigated students' aims of accomplishments and those amenities required of them to function.Descriptive survey method was adopted. Questionnaires were distributed to elicit information while analysis was engaged by using chi-square. Infrastructural facilities development variables like buildings, transportation, recreation and other facilities having significant relationship with variables of academic goals were revealed.

The research of Duyar (2010) explored the correlation ofhow the training is being conveyed to the situations of amenities found in colleges to in the United State of America. The study looked at the training values of some amenities situations and how they affect the way being conveyed using the structures of 3 (three) learners and colleges. Multivariate correlational research design was used while the data was analysed with mean and multiple regressions. Findings indicated school facilities conditions (walls, windows, doors, air conditioning; classrooms) substantially predicted instructions at the colleges understudied. The result also showed part of the considered amenities were

indicators connected with the way the training is valued.On the other hand, Babatope (2010) investigated the problems of facilities and the way forward in South Western Nigerian Universities. Random sampling was employed in questionnaire distribution. Analysis was engaged using percentages and frequencies. The result revealed that the value and worth of colleges were enhanced through sufficient amenities provided and applying the culture of taking good care of all that were provided.

The study of Ekundayo (2010) explored the connection that learners' attainments have with amenities available in the school.Descriptive method was used. One thousand and two hundred (1,200) teachers from sixty (60) government controlled post primary colleges were sampled using different procedures according to their strata. Respondents' information collected was with questionnaire. Analysis was carried out with percentage, frequencies and correlations. The result showed learners' attainments have good connection with college amenities to enhance the levels of learning. The implication of this is that, levels of learning will be improved upon if amenities found in the colleges are provided for the way they should and are also properly engaged.

The work conducted through Fabiyi and Uzoka (2009) investigated the procedures to be employed in terms of amenities in order to be able to accommodate the progressive nature of students' number in providing valued training. Research was expressive in nature and universities considered were based on ownership strata and Lagos state institutions were used.Eightteen (18) heads of departments formed the sample size.Pearson's Product moment correlation was used to test the only hypothesis while simple percentages and t-test were used to answer the three research questions raised. Result revealed that most physical facilities like workrooms, where people look-up for information, and classroom, had become old-fashioned and modification of the amenities will have a long way to support greater achievements in students learning. The findings also showed that where collections of books are being used by students had some outmoded books and also,the laboratory equipment was also out-dated.

2.2.3 Human resources and Employability Skills

The study conducted by Okpokwasili (2019) examined how well the students are doing in their learning abilities and how they are being trained. The study took place in both

Rivers and Bayelsa States respectively. Three (3) universities were selected. The work was a correlational one. Only 277 lecturers from these universities were selected. Means scores, deviation of standard and Pearson's product moment correlation were used. Finding showed there are a great correlation between attainments of students in the disciplined area (LIS) and how the training is acquired as well as how it is applied and their expressive abilities.

Donald, Baruch and Ashleigh (2017) explored human capital and employability skills among undergraduates. Role of jobs guidance as well as proprietorship were also ascertained. A cross sectional study was conducted using the undergraduates (387) at a United Kingdom University. The findings revealed that human capital is a very important component that impact employability skills in a positive manner. This will inform the stakeholders in better preparation of students for labour market using better informed strategies.

Chowdhury and Miah (2016) study offers a multi-dimensional employability skills scale development method. The study explored the attributes needed to get a job newly; the views of learners andmanagers of jobs; and various cadres involved in handlingpersonnel.A 30 item, seven dimensions, and another 26 item six dimensional employability skills requirement scale use for entry level human resources position as perceived by employers and students in Bangladesh. Sample sizes were 174 and 446 respectively both from managers and university students. The findings revealed that there were significant variations in ESR inhandling new cadre employees'situations.Job managers viewed information on subject, application and being able to be attentive to information passed as significance. Attributes like pro-activity, negotiation ability, being able to apply common sense in difficult situations are desired by learners.

A funnel approach was adopted in reviewing empirical studies on human resources as well as assessment strategies and employability skills. In the process of reviewing empirical studies on the two independents variables linking the dependent variable, it was discovered that, there is a dearth of literature on them. Meanwhile, there are literatures on the variables with no existing literature linking the present study independent variables to the dependent variable. So, this study will serve as one of the empirical study in the area in the near future. However, none of authors has been able to

combine quality academic curriculum and employability skills most importantly among science students and in particular, South-West of Nigeria despite the tome of literature. This study therefore, investigated the quality of academic curriculum and employability skills among university science graduates in the South-West, Nigeria.

2.2.4Methods of Teaching and Employability Skills

Goodwin, Goh, Verkoeyen and Lithgow (2019), explored teaching and learning research on how potential employees who are still under training can learn to juxtaposed the attributes with the labour market prerequisites by using experimental research (experimental group and control group). The study adopted electronic assessment and Situational, Task, Action, Result (STAR) format over a period of half a year(six months). Study combines practical and instructional design. Forty four (44) different courses with three thousand and four hundred (3,400) students in a University in Canada were sampled. The findings revealedcapability of talents delivery as the only predicting factor having priorexposure to the STAR format. Also, other factors such as program and year of study do not influence articulation.

Mahajan (2017) conducted a study on the procedures involved in vocational training attributes, and the impression it has on thefulfilment of picking an institution. The research was carried out in North-Maharashtra University. A qualitative research through a survey was used and quota sampling technique was used to sample 664 students using structured and closed ended questions measuring employability skills. Questionnaires were sent to the students through e-mails. The findings revealed that students were interested in soft skills like creativity, self-confidence and that conspicuous different views were exhibited by learners in the bid ofconstruing the constructed attributes. And those undergraduatesdesired technical education schools thatdeals withattributes that are connected with what their intentions were.

In the study of Murugavel and Clement (2015), investigation was carried out on English Language as a part of curriculum in India which a key is factor in acquiring employability skills as well as finding a job placement. The study adopted watching the learners in their natural setting, key informant guide and questionnaire. They included different engineering colleges while 200 responses were given willingly from these

participants. Frequency count, percentages (quantitative data) were used to analyse the data as well as qualitative analysis for the interviews. The findings revealed that there is a clear cut difference in what actually happens in the class while the students were taught and the approach applied. Also, a hole existed between self-confidence as an attribute and the methodology employed for students in engineering. The findings also exposed the training needs of teachers so that they can do better in passing the attributes needed by their students.

Udofia, Ekpo, Nsa and Akpan (2012) conducted a study on instructional variables and students acquisition of employability skills in Vocational Education in Nigerian Technical Colleges. The study focused on quality of teacher and methods of teaching as assessing training materials for students to acquire employability skills in Akwa Ibom State. The research is correlational.Students' questionnaire that contained 28 items was used. Those that participated were 240 technical two students which were randomly sampled. Data analysis was engaged regressions, mean, and Pearson's product moment correlation. Result showed a substantial connection of acquisition of skills by students with teaching methods.

The study of Ruhizan, Seamah, Ramlee and Kamaruddin (2011) on development of generic employability skills through peer interaction and contextual teaching and learning explored the final year civil, electrical and mechanical students in community colleges in Malaysia. Sample size was systematically randomised which was 250 out of students' population of 275. This was determined using the guidelines of Krejcie and Morgan (1970). A sample size of 256 was needed for the student population of 759. Questionnaire was employed to measures 10 different employability skills. Data analysed with descriptive statistics (frequency count, mean and percentage) and inferential statistics (ANOVA, regression) of SPSS 19 were used to analyse the data. Findings revealed significant correlation existed between peer interaction, contextual teaching and co-curriculum management, to the variance in employability skills.

Baker and Henson (2010) conducted a study on encouraging attributes formation in a research-intensive college. The study took place at University of Nottingham, United Kingdom. The study adopted an action research methodology. The findings revealed that different factors are responsible for the establishment of programmes in this

University and that developing employability initiatives in higher education is very paramount.

Riebe, Roepen, Santarelli and Marchioro (2010) in their study titled "Teamwork: effectively teaching an employability skill, presented a scenario of teaching the attributes with students attending a college and undergoing some training in business that will allow them to work in collaboration. Questionnaire led the students and others on collaboration. Electronic assessment (2) was able to monitor how the group ability is encouraged and also gave report back to the students.Intuitive weblogs was also used in providing insight into students' perspectives. The findings revealed that team surveys aided students' engagement in teamwork. And that the students' experience of working in teams provides a clear, conceptual framework for developing collaborative attributes.

Robley, Whittie and Murdoceh-Easton (2007) conducted a study on mapping generic skills: a recommended methodology in United Kingdom medical curriculum by embedding generic skills into undergraduate's medical study at Leeds school of medicine. The medical students were selected as the components of the programme. The program was done in a clinical setting to bring about some attributes that are innate in medical students.The methodology adopted was primary data, key informant guide, student focus group and questionnaire using project supervisors and students, and running the programme over a period of one academic session. The findings revealed that mapping generic skills proves valuable by embedding the skills in the programme to evaluate its success through the stakeholders.

The study of Gallowey, Anderson, Brown and Wilson (2005) investigated the access to the likely training on becoming self-reliance in order to bring about the attributes as well as the perception in learners towards its value in the society. This work took place in America. The methodology adopted was longitudinal, and collaborative in nature. Students of four universities were randomly selected in which a questionnaire based methodology using 519 students were sampled. The findings revealed that entrepreneurship education seems to have much potential to develop skills appropriate for the enterprise economy.

2.2.5   Assessment Strategies and Employability Skills

Deeley (2014) investigated anabysmaleducation procedure in promoting behavioural attributes through summative Co-assessment. The study focused on both formative and summative co-assessment of students in different employability skills. Eight in depth semi-structured interviews were conducted individually with each of the students on the course. Interview guides were used for the learners as well as focus group. Concept maps were drawn for each group. The interviews were thematically transcribed. The results revealed that students had never experienced oral presentation as a method in summative assessment while verbaliseddemonstration of foundational valuation was experienced at lower levels in college. As a result, they were able to report self-confidence in their self-assessment.

The study of Bakar and Hanafi (2007) on assessing employability skills of Technical- Vocational Students in Malaysia utilised simple random sampling technique for third year students of technical training institutes. The sample size was 162 students of the institute and the adapted instrument from SCAN to giveinformation about employability skills. Data analysed with mean score. The result revealed mean score for the whole employability skills was very high and that the variable with maximum means scoreis theworth of individuals.

Cassidy (2006) conducted a study using noble valuation of tertiary institutions in promoting attributes.That isearl assessment as a strategy to developing employability skills. This study took place in Stanford University, United Kingdom. The study adopted structured peer assessment method in assessing students' attitude toward members of the class judging the worth of each other in their class work. Study was able to pool together both controlled/regimented interviews in a longitudinal procedure and also questionnaire that reveals who an individual is. Forty-one second year undergraduate students taking psychology took part in the grading each other's work. Findings revealed learners'confident behaviours toward grading each other's work. Also, students expressed worries over not being able to judge each other's level of abilities. The findings revealed further that focus should be on evaluative skills of students which will equip students with regular employment related skills.

A funnel approach was adopted in reviewing empirical studies on human resources as well as assessment strategies and employability skills. In the process of reviewing empirical studies on the two independents variables linking the dependent variable, it was discovered that, there is a dearth of literature on them. Meanwhile, there are literatures on the variables with no existing literature linking the present study independent variables to the dependent variable. So, this study will serve as one of the empirical study in the area in the near future. However, none of authors has been able to combine quality academic curriculum and employability skills most importantly among science students and in particular, South-West of Nigeria despite the tome of literature. This study therefore, investigated the quality of academic curriculum and employability skills among university science graduates in the South-West, Nigeria.

2.3   Appraisal of Literature

The review of literature affords the opportunity of having the ideas and knowledge of areas already covered in literature on the variables of the study and areas that have been unable to cover. The pattern employed for the literature review in the study, showed the outline of literature concerning both dependent and independent variables. This was arranged into different sub-headings with the objective of providing discussions on the studies related to quality academic curriculum (instructional materials, physical facilities, human resources, Methods of teaching, assessment strategies) and employability skills.

The literature recognised that employability skills are necessary transferable skills that every potential graduate must possess so as to find a job (Overtoom, 2000; Yaya, 2004;Merrifield, 2013; Oyebade and Adedeji, 2014 and USDE, 2016).Employability skills are the attributes that can be used over different occupations and they are required by employers of labour. They all agreed that, employability skills are innate and intellectual attributes possessed by graduates in preparation for the labour market (Obanya, 2002; Burgaz, 2008; Weligamage, 2009; Ruhizan et al, 2011; Oyekan, 2012; Asuquo and Agboola,2014).   Employability skills, if not acquired by the university graduates can result into not being able to be gainfully employed by the employers of labour. Skills that are seen as highly been sought for by employers of labour include communication (oral and written), working together for a common purpose

(teamwork),decision making, responsibility and initiative, adaptability (Hart Research Associates, 2013; Jackson, 2013; Drummed and Rosenbluth, 2015; Strachan, 2016; Harrison, 2017 and STEMNET, 2019). However, Atkins (2013) sees the employability skills as a way of marginalising the young people. On the contrary, some authors agreed that employability skills are steadily deteriorating (Dabalen, Oni and Adekola, 2003; Adeyemo et al, 2010; Merrifield, 2013; Agboola and Asuquo, 2014; Oyebade and Adedeji, 2014).

Previous studies conducted on curriculum showed quality curriculum to be meaningful for teaching and learning when it is coherent, relevant, rigorous, flexible and current (Camosun College Centre for Excellent in Teaching and Learning, 2017). Also, goals in acquiring employability skills must be embedded when curriculum is being planned for (Bybee et al,2010; Livanos, 2010; Marita and Felix, 2010; Kleijn et al; 2012; FRN,2013 and European Commission Report, 2015). The goals included: skills achievement in the use of science analytical tools as an empirical field of study, development of analytical skills and confidence in students through provision of adaptable practical oriented education (National Universities Commission, 2015) among others. In lieu of the curriculum, instructional materials, physical facilities, human resources, methods of teaching, and assessment strategies are variables that determined the acquisition of employability skills by the students.

Literature reviewed on instructional materials acknowledged material resources such as textbooks, filmstrips, tapes, maps, charts, pictures, newspapers, diagrams, periodicals, television, video tape recorders, still and non-still materials that can make teaching and learning possible (Likoko et al, 2013; Okoro, 2011; Agun-Obu, 2008; Okeke, 2005 and Agina, 2005). In the same vein, Abolade (2010) reiterated that, there are three categories of instructional materials namely printed, non-printed and community resources and that it is expedient for educational materials to be well prepared and suitable for intended purpose. However, Oladejo, Ojebisi and Ishola (2011) and Lahina (2017) maintained that use of instructional materials helps teachers to make the lesson more clearer to learners and that in teaching science, instructional materials are very important to students.On the other hand, (Hakielimu, 2008; Adeogun, 2010; Laddunuri, 2012; Kimeu, Tanui and Alex, 2015) revealed that instructional tools has a connection

with students' attainments and that the school with more resources perform better. No wonder Muthamia (2009) reiterated that teachers can only be active and creative when sufficient and up to date amenities are provided.Bamiro and Adedeji (2010) asserted that resource allocation is an emerging issue in current literature. This is because many problems of schooling are related to allocation and utilisation of educational resources. However, (Afework and Asfaw, 2014; Effiong and Igiri, 2015; Isa and Yussouf, 2015) explained that instructional materials contribute significantly to teaching and learning process in terms of academic achievement. This indicated that, adequacy of instructional materials will determined to some extent how well a quality curriculum will be implemented.

To this end, Okoro (2008, 2011) observed that inadequate laboratory and materials, equipment affect teaching and learning in every science oriented curriculum. The learning tools serve as support for knowledge acquisition like employability skills. Gisterea (2013) also mentioned tools and methods to predetermine a viable way of passing information. Also, Wambui (2013) asserted that quality of curriculum given to students rested on tools that are obtainable and its sufficiency meanwhile inadequacy of the tools can create problems.

Empirical review on instructional materials and employability skills by Ezenwa (2018) on evaluation of instructional tools by instructors in Imo State, an expressive research, using cluster procedure for students in the junior secondary school. The study was about enhancing their communication skills in French curriculum. Only 360 students and 15 teachers were sampled out of 20,384 students in all. Percentages, t-test and mean ratings were used for analysis. The findings showed a significant difference in instructional materials for teaching French content. The use of textbooks to teach students brought about acquisition of language skill for communicating. This study only acknowledged the use of print materials as categorised by Abolade (2010) but failed to include non-print materials and community resources. The current study is filling this gap through giving of consideration to adequacy of printed and duplicated materials, non-projected materials, still projected display tools, computer mediated tools, physical as well as human materials.

In a study conducted by Nartey (2018) using descriptive survey design investigated the use of tools and attainments of learners in high schools of cape coast metropolis, Ghana. The population was the science students and physics teachers in the metropolis. Only 160 science students and 13 physics teachers were sampled. Simple percentages and frequencies were employed for the analysis. Findings showed a very high extent in the use of instructional materials except for projectors and the laboratories and that teacher revealed that all other instructional materials are adequately used. The findings further showed a substantial connection existed in the performance of physics students and extent of using relevant instructional materials. In the same vein,the studies of (Adebayo and Adigun, 2018; Arop, Umunah and Effiong, 2015; Omoebe and Akanni, 2015; Aina, 2013) used the same method of data analysis and research survey design to carry out studies on instructional tools and learners; training attainments. From the findings in these studies,it was revealedthat instructional materials influenced academic performance but the studies failed to acknowledge that academic performance is synonymous to employability skills since the studies were carried out in senior high schools and majorly in other parts of Nigeria except the South-West. Present work considered the gap occupied using all students of physical sciences as well as their instructors'residing in South-West geo-political zone of Nigeria.

However, investigation conducted by Adedeji and Oyebade (2015) on Graduate employability in Nigeria: Thoughts, travails and tactics used both quantitative and qualitative data. Only 1, 0365 students across three universities were randomised. Mean score, chi- square and content analysis were used for data analysis. The findings showed some skillswere missing in the work of the universities and that lack of reading materials, poorly equipped language laboratories and workshops are responsible for the students not being able to acquire the employability skills needed. The current study filled the gap by identifying the skills students have acquired and those unable to be acquire.

Literature reviewed on physical facilities acknowledged that physical facilities in education are related to students' performance (Vidalakis, Sun and Papa, 2013; Owoeye, 2000; Ajayi, 2000; Adewumi, 2000; Adeboyeje, 1984; Nwankwo, 1982). And those physical facilities were categorised into buildings, libraries, computer room, laboratories, classrooms, furniture, toilets' which a school needed to function very well (Abbassi,

Malik, Chaudhry, 2015; NUCBMAS, 2015; Akomolafe and Adesua, 2016). Likewise, Nirav, 2010; Abbasi et al 2011; Akomolafe and Adesua, 2016 and Kapinga, 2017maintained that physical facilities are backbone of any school. However, Ibrahim, Osman, Bachok and Mohammed (2011); Ogunniyi (1982) and Adedeji (1998) reiterated that these amenities therefore, requires sufficient provision and continuous maintenance. Meanwhile, Ndirangu and Udoto (2011); Ekundayo (2010) and Owoeye and Yara (2011) submitted existence of positive link of college effectiveness with college amenities.Reinforcement was by Bakari, Likoko and Ndiyo (2014) while Odeh, Oguche, Ivangher and Dondo (2015); Isa, Yussouf and Gwamma (2017) asserted students' attainment in school being determined by physical facilities and must be adequately provided for.It was very obvious that, inadequacy of facilities will have negative impression on students (Isa, and Yussouf, 2015) and more reason for Akomolafe and Adesua (2016) and Onyeike Onyeagbako (2014) to have said that the presence of different amenities are germane in encouraging teaching as well as learning.

Empirical review on physical facilities and employability skills by Ekundayo (2010); Lyimo, Too and Kipng'etich (2017) and Maigi, Mulwa, Maithya and Migosi (2017) worked on expressive research with, questionnaire and mixed methods. Analysis was done withdescriptive and inferential tools. Results showed the connection of the level of academic achievement and discipline with sufficient amenities. The current study also used descriptive as well as inferential statistics. However, Ekundayo(2010) laid emphasis on the psychomotor and affective domains of reasoning but this study emphasised the three domains in learning that included cognitive learning. Also, the studies did not provide sufficient information on the learning outcomes of academic performance to be synonymous with employability skills. These are some of the gaps the current study was able to fill.

Studies of Mackatiani (2017); Shad, Khan and Khan (2013) and Anifowoshe and Lawal (2013) used descriptive survey research design, mixed method approach and questionnaires to elicit information from the respondents. The findings showed that availability of physical facilities influence quality of education. There was limited information on linking the physical facilities to learners' accomplishments. A gap being filled through the current study.Similarly, studies of Sawyerr and Yusof (2013); Duyar

(2010) and Babatope (2010) investigated facilities and academic goal achievement and delivery of instruction using descriptive method of correlational type. Data analysed through multiple regressions and descriptive tools. Findings showed facilities have significant relationship with variables of academic goals; facilities positively predicted the delivery of instruction. Current study supported Sawyerr and Yusof (2013) but Babatope (2010) and Duyar (2010) only looked at the problems of facilities and delivery of instruction without taking into consideration the learning outcomes. This was the gap being filled by the current study. Finally, Fabiyi and Uzoka (2009) used descriptive research design to examine how physical facilities can help in offering quality education. Pearson's product moment correlation, percentages and t-test were used to analyse the data. Results revealed physical facilities will support academic achievement of students. The study focused on facilities as enhancing quality education but failed to provide information on learning outcomes as a function of quality education. The current study filled this gap.

Literature reviewed on human resources recognised the concept to mean people, resource that resides in the knowledge skills as well as workforce of organisations (NUCBMAS, 2015; McGaughey, 2018; Wikipedia, 2019). No wonder, Akindolu (2010) agreed that without human beings, a nation's wealth cannot be constituted. Ekankumo and Kenebaradikumo (2011) and Unwin (2015) also maintained that both quality of teaching and lecturers depend on professional development. However, Blaxell and Moore (2012) asserted that academics must demonstrate and use all their skills and methods to teach students so that they can develop the skills and attributes needed for labour market. Equally, showcasing the abilities acquired while in school by the learners is also essential (Unwin, 2015) to their potential employers. Onyeike and Onyeagbako (2014) however reiterated that, efficiency and quality output will be achieved from the side of the workers if organisations promote motivation among its human resources with academic institutions inclusive. Bamiro and Adedeji (2010) are of the view that if resources are inadequate, and the available ones are not efficiently managed, it might lead to producing poor quality of university graduate.

Empirical studies reviewed by Okpokwasili (2019) investigated manpower training needs and students' academic performance using correlational study research

design. The findings indicated some areas of capabilities that needed workforce training which influences learners' accomplishments.The study did not provide sufficient information on other skills but only on communication skill. This indicated that the students would acquire communication skills alone because the human resources needed for teaching were trained on this. On the other hand, the study left out other skills with the implication that students will not acquire other skills. The current study filled the gap by identifying other skills that the students must have in which their teachers might need training on.

Donald, Baruch and Ashleigh (2017) study explored effect of human capital on employability skills. The study was cross sectional and the findings showed that human capital is a very important component that impact employability skills in a positive manner. The study did not provide sufficient information on the types of employability skills that were impacted positively meanwhile the current study identified 15 employability skills. The study carried out by Chowdhury and Miah (2016) investigated employability skills entry level, students and employers perception. Survey method was used. Findings showed employers prioritised subject knowledge and applying knowledge over other skills. Learners gave priority to application of intelligence as well as collaborative work among others. In the current study, the employers' prioritised teamwork followed by initiative and interpersonal skills respectively while leadership skill top the priority list of the students.The previous and the current studies took place in different countries with variations in employability skills listed.

Literature reviewed recognised that science consists of convectional lectures and cookbook laboratory that needed to be changed in terms of methods of teaching (Odom and Kelly, 1998; Handelsman et al, 2004; Bartz and Miller, 2005) and that the drawback of this system will not make learning interactive (National Research Council, 2007 and Standford, 2012). They agreed that in teaching science courses, it must be experimental, vigorous and evidence based for skill acquisition attainment. The work considered filling the gap by finding out which experimental method of teaching science courses brought about acquisition of skills to the students.

Methods of teaching science courses recognised by literature are peer-peer teaching, discrepant event, current events, inquiry approach, questioning, among many

others (LinkedIn Corporation, 2017; Stanford, 2012; Schroeder et al, 2007; Wieman, 2005; Salandanan, 2000 and Marzur, 1997). They agreed that these methods of teaching can generate effective teaching in achieving the goals of skill acquisition in the field of science. One of the previous studies on methods of teaching indicated that combining methods with what the students need plus the resources available for teaching will achieve desired results (Bartz and Miller, 2005).

Empirical review on methods of teaching and employability skills by Godwin et al (2019) using STAR format and online survey for over a period of six month revealed that previous exposure of students was a significant factor influencing students skill acquisition. Therefore, the need for continuous exposure to situational, task, action result (STAR). Studies conducted on approach to employability skills in technical education by Mahajan (2017) showed that students are interested in skills such as creativity and self-confidence. Other employability skills recognised in literature were not mentioned in this study. The current study filled the gap by identifying 15 employability skills that students acknowledged they were able to acquire to a large extent.

The study of Murugavel and Clement (2015) attempted to fill the gap of employability skill acquisition by considering the role of language as part of curriculum which germane in employability skills acquisition as well as finding job placement. Although the study of Udofia et al (2012) focused on the quality of teachers and methods of teaching as assessing training materials for students to acquire employability skills. The study attempted to find a correlation between instructional variables and students acquisition of employability skills. The findings showed substantial connection of capabilities gained by students with teaching methods teaching methods in vocational education among technical colleges in Akwa Ibom, Nigeria. The study failed to establish the precise methods that contributed to acquisition of skills by students. A gap was filled by the work in showing that a particular teaching method would significantly influenced acquisition of skills in the South-West, Nigerian universities which are Inquiry methods. Ruhizan et al (2011), Baker and Henson (2010), Rieben et al (2007) and Gallowey et al (2005) used primary data, questionnaires, interviews and focus group methods to conduct studies on different methods of teaching to acquire purposive employability skill. The findings showed teaching methods having substantial connections with aided

employability skills such as teamwork. This study was carried out in countries of the world rather than Nigeria. The current study was narrowed to Nigeria and a geo-political zone which was the gap the study attempted to fill.

Literature reviewed on assessment strategies and employability skills indicated that assessment will be meaningful in learning process if it is followed up correctly by teachers (Mushon, Lestari, Supriyanto and Baroroh, 2015). Also, Irwanto,Nugraheni,Puspita, Astuti and Prasentyo, 2015) noted assessment to be capable of increasing a student's cognitive ability and that learning assessment aimed to evaluate the student's cognitive dimension (knowledge), Affective dimension Attitude) and Psychomotor (Skills). According to the Queens University Learning Centre (QULQ,2015), asserted that, quality of curriculum and its assessment procedure can be enhanced by providing feedback to the students and how they will demonstrate the learning as well as selecting the assessment that matches the learning objectives. Ferris (2010) observed great difference in written assessments including laboratory reportsand learners' performance at the laboratory. Since practical activity requires process skills approach, there is need for the students to discover and develop the facts, concepts and scientific skills (Jelita, 2013).Formative assessment include observation, discussion, checklist, peer-self assessment, questionnaire, laboratory reports, demonstrations, problem solving are recognised by Aranas (2017); Carnegie Melon University (2016); Villannueva (2015); QUCL (2015); Regier (2012) and Garrison and Ehringhaus (2011). On the other hand, summative assessments are assignments, quizzes, tests, mid-semester examination, final examination and final project (National Universities Commission Benchmark, 2015).

Empirical review on assessment strategies and employability skills by Bakar and Hanafi (2007) on assessing employability skills of technical-Vocational students used simple random sampling technique to sample 162 students using SCAN as instrument. Data analysis employed mean score. Results showed employability skills mean was high likewise the personal quality has the highest mean score. This study failed to use any assessment strategy that can bring about the acquisition of employability skills. The current study filled this gap by considering both formative and summative assessments to determine acquisition of employability skills by students.

In Cassidy (2006) empirical study on developing employability skills using peer assessment in higher education, the study adopted structured peer assessment method. The findings showed when learners are given opportunities to judge the worth of each other; it brings about the good behaviour in them. The findings showed further focus on evaluative skills of students which will equip them with regular employment related skills. This study only focused on an assessment strategy and an employability skill. The current study filled this gap by considering other assessment strategies and employability skills.

It is evident in all the studies that the rate of acquisition of skills by students in universities is low and suggestions were made on how to include skills' acquisition in the curriculum. However, indicators that were taken into consideration included quality in academic curriculum indices (adequacy of instructional materials, physical facilities, and human resources, methods of teaching science courses, assessment strategies and employability skills). A funnel approach was adopted in reviewing empirical studies on human resources and employability skills as well as assessment strategies and employability skills. In the process of reviewing empirical studies on the two independents variables linking the dependent variable, it was discovered that, there is a dearth of literature on them. Meanwhile, there are many literatures on the variables with no existing literature linking the present study independent variables to the dependent variable. So, this study will serve as one of the empirical study in the area in the near future.This study therefore, investigated the quality of academic curriculum and employability skills among university science graduates in the South-West, Nigeria.

The study should assist the stakeholders of education (policymakers, administrators and students) in providing basis for better planning, adaptability of better curriculum policy, areas of policy that require more attention as well as the relevance of skill acquisition to the potential employers and the larger population.

2.4   Theoretical Framework

There are many models proposed by different authors that are appropriate for this study. The theoretical framework considered for this study emanated from quality Enhancement model adopted from Middlesex University, London.

2.4.1   Quality Enhancement Model

The quality enhancement model is a model by Georgiadou (2016) which has four indicators namely Plan (P), Do (D), Check (C) and Act (C). This model showed that, there are standards that every policy is measured against when it comes to quality of academic curriculum and employability. Curriculum is planned with quality in content while goals and objectives are checked to be in place after implementation has taking place.

Different institutions implement in different ways; thereby outcomes will definitely be different. When the objectives and goals contents are implemented through quality pedagogies, quality results will be achieved. Implementation at different times may lead to positive or negative improvement in quality. Positive improvements are realised to enhance quality of the curriculum through quality implementation. This therefore helps in realising the goals of having such content, which are employability skills needed by the graduates. This is a feedback to the planning initially made so that what needs to be done to improve the quality can be implemented. With time, quality will be achieved, if standards are followed. This is because the process of quality enhancement is a dynamic interaction of variables in other to achieve expected outcome.
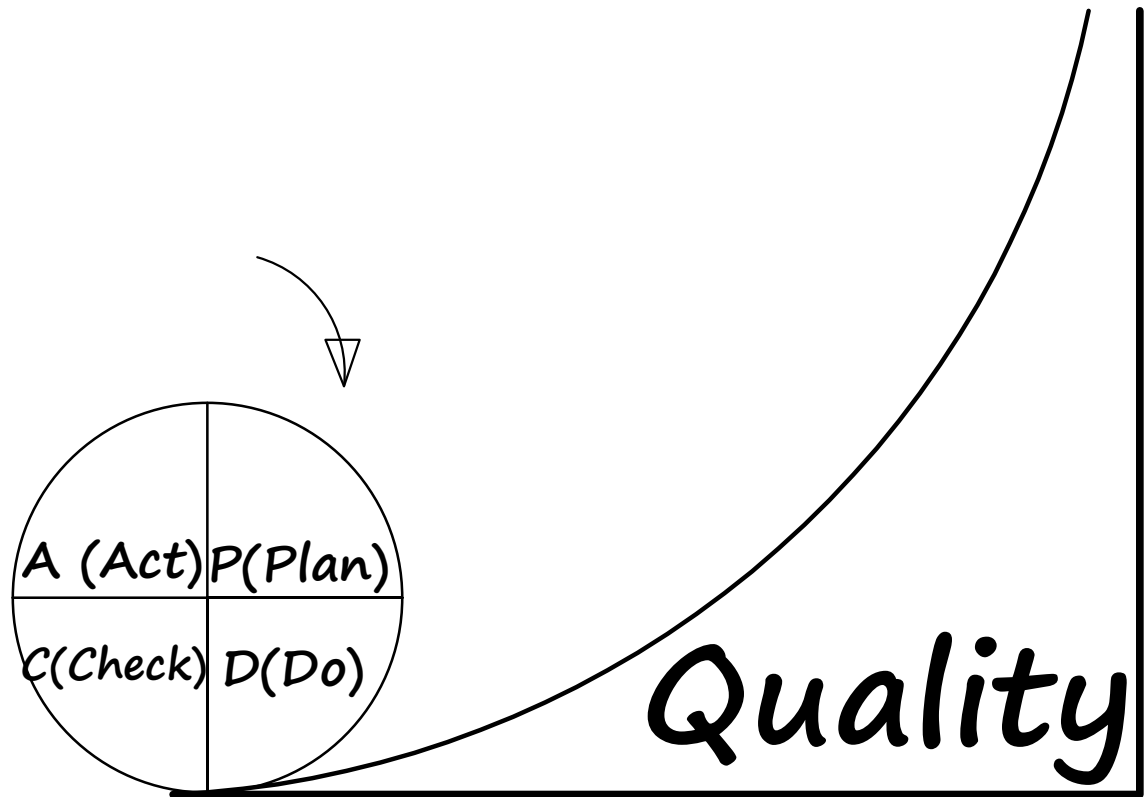
Figure 2.1:   **QUALITY ENHANCEMENT MODEL**
Source: **Adopted from Middlesex University London (2016)**
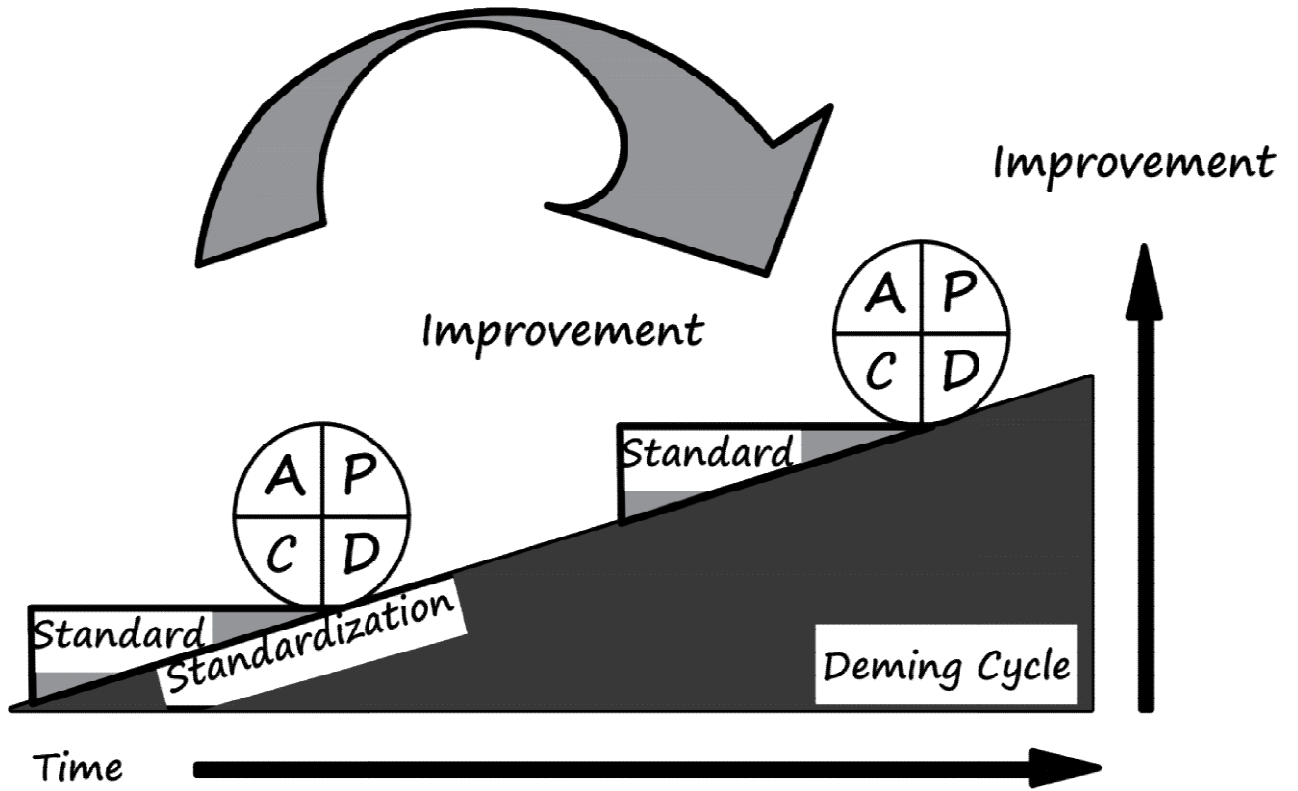
SCALE: **1:20**

Figure 2.2: **PCDA and Standards**

Source: **Adopted from Middlesex University London (2016)**

SCALE: **1:20**

2.5   Conceptual Framework of the Study
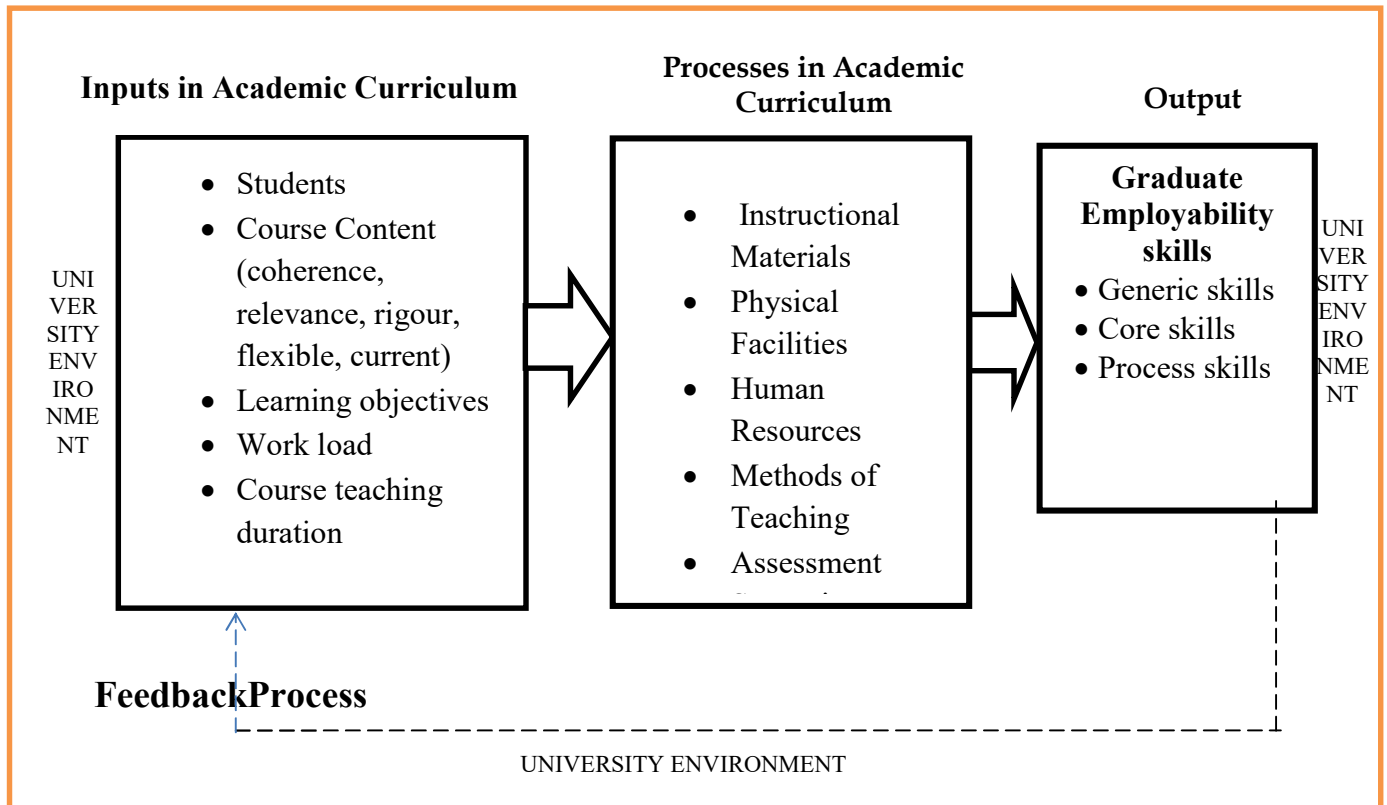
Fig 2.3 Conceptual Framework

Source: Researcher's conceptualisation – Fieldwork (2017)

The conceptual model (Fig.2.3) described the inputs in quality academic curriculum to include students, course content with its qualities (coherency, relevancy, rigour; flexibility and currency), learning objectives, work load and course teaching duration with indicators on employability skills (dependent variables) through quality processes of instructional materials, physical facilities, human resources, methods of teaching as well as the assessment strategies(independent variables). The inputs are assumed to have relationships (positive or negative) with acquisition of skills by Nigerian graduates in public and private universities with each university having her respective characteristics. If the inputs in academic curriculum are appropriate, up-to-date and no flaws and the processes involved in having quality academic curriculum are not adequate, the outcome of the learning process which is graduate employability will not be achieved. This will definitely be as a result of inadequate of poor processes involved. Also, if what constitutes the process is not available, implementation of quality curriculum might be difficult.

On the other hand, if the inputs are intact in the university system and the processes are adequate and being implemented accordingly using quality assurance as a checkmate, the desired learning outcomes will be achieved, which is tantamount to the abilities gained. Processes employed by universities in the implementation of the quality academic curriculum or otherwise, will determine the outcome of how employable graduates would be achieved. To consider a curriculum as a quality one, it must fit the purpose of its planning, there must be performance indicators, and it must add values to the lives of the students and skills needed to be employable after graduation must be embedded in such curricula. The universities interact with one another to improve their performance in terms of learning outcomes.

If cognisance is taken of the inputs as well as the processes involved in implementing quality academic curriculum, from my point of view; if quality of academic curriculum thoroughly implemented through adequate inputs and rigorous processes, this will produce a better and competitive university graduates that will be readily prepared for labour market. This will occur because the school-industry linkage would have been created while curriculum are planned, monitored, reviewed and implemented to suit the demand of the employers in terms of the required skills to

compete in the labour market as well as other inputs taking into considerations. Graduates are better equipped for future labour market and challenges ahead when all these inputs and processes in academic curriculum are fully adhered to irrespective of each university characteristics. Meanwhile, given that universities might not be able to implement at the same level and with equal strength, this will bring about variations in universities' outcome.

CHAPTER THREE
METHODOLOGY

In this chapter, the various procedures adopted in gathering data for the study were presented.

3.1   Research Design

This work is correlational in nature using descriptive research design. Pre-established instruments were developed, to show the connection or link in combining existing variables. The researcher has no control over these variables, but only reported what had happened. This method helped to identify the relationships between the quality of academic curriculum (instructional materials, physical facilities, and human resources, methods of teaching andassessment strategies) and employability skills of science graduates of universities inSouth-West, Nigeria. The design facilitated the gathering of needed primary and secondary information through the participants. The preparation of such design facilitated the triangulation of the qualitative and quantitative data to yield efficient and effective information gathering.

3.2   Population of the Study

The population of the study consisted of36 accredited universities in the South-West, Nigeria. These universities cut across the federal, the state and the private institutions. The private universities were categorised as faith-based and non-faith based according to the National Universities Commission (NUC, 2015). There were, as at 2017/2018 academic session, 9,030 potential science graduates and 2,142 lecturers in the faculties of science in these institutions. The list of the universities and the population of the potential science graduates and science lecturers are presented on pages 208-209(Appendix VI).

Other participants in the study were employers of labour or employing organisations especially those in formal registration with organised private sector, manufacturers' Association of Nigeria, National Association of Small Scale Industrialists

and the Nigeria Chambers of Commerce and Industry as well as Officials of the National Universities Commission among others.

3.3   Sample Size and Sampling Techniques

The sample size used in this study,consisted of 371 lecturers; 1,330 potential science graduates; 30 employers of labour and four National Universities Commission officials. The study adopted a multi-stage sampling procedure. Stage one is about breaking South-West geo-political zone, which consisted of six states, namely Ekiti, Lagos, Ogun, Ondo Osun and Oyo. The zone was selected because many of the universities in these states have developed and implemented the curricula that could lead to the acquisition of employability skills. The researcher actually wanted to sample all the six states but only five states were eventually sampled due to the unresponsive nature of universities in the sixth state.

The second stage involved out of thirty six (36) universities in South-West – Public federal, -public state, -private and faith-based, three private and four public universities comprisingone federal and three state universities were selected using the stratified sampling technique to represent ownership. The state universities selected cut across four out of the five states that responded. Participants include the potential graduates of faculties of science, science lecturers, employers of labour and the NUC officials.

Stage three has to do withpurposive sampling of faculty of science due to its homogenous population. The choice of faculties of science was to justify the 60-40 government policy on allocation of resources, admissions and staffing to science-based disciplines. This justification was to verify whether the allocation is necessary compared to the skills acquired by these students. In addition, faculty of science was selected due to the homogeneity of the learning objectives of the discipline that gives room for the same parameter to be measured across board, the uniqueness of science curriculum learning objectives that are based on practical.Also, it is about the science curriculum learning objectives that emphasised critical and analytical thinking which were created from Bloom's taxonomy verbs while academic staff of the universities prepares the contents to be taught using the NUCBMAS as a guideline.

The total enumeration technique was employed for teachers (258) likewise the potential science graduates (1032) of private and state universities selected. The technique was used, due to their manageable number, in which the entire population should be sampled.

The only federal university purposively selected had 50% of both the lecturers (226) and the potential science graduates' (596) population sampled. Random sampling technique was used sinceany of the elements in the population has the probability of being selected. Overall number of students sampled was 1,330 while that of the lecturers was 371.

In addition, the potential science graduates became the focus of attention due to meeting the required six months internship (Student Industrial Work Experience Scheme) which would have accorded them the opportunity to exhibit or apply the soft skills acquired already in the classroom; and the students must have spent considerable number of years in the university and are ready for the labour market.

Stage four dealt with randomising 30 (thirty) labour employers that cut across seven sectors of the economy, namely manufacturing/construction, agricultural/forestry, health industry, banking and insurance, education, judiciary and telecommunication (See Appendix V).

Table 3.1Sample size for private universities (Faculty of Science)

S/N	University	No of Lecturers	No of 400 level Students
1.	Adeleke University , Ede, Osun State	18	100
2**.**	Caleb University, Imota, Lagos State	29	100
3.	Wesley University, Ondo	23	50
Total		**70**	**250**

*Source***:** Fieldwork (2017)

Table 3.2Sample size for public universities (Faculty of Science)

S/N	Name of University	No of Lecturers	No of 400 level students
1.	Adekunle Ajasin University, Akungba Akoko	50	296
2.	Ekiti State University, Ado- Ekiti	98	292
3.	Osun State University, Osogbo	40	194
4.	University of Ibadan, Ibadan	113	298
Total		**301**	**1,080**

*Source:*Fieldwork (2017)

Seven universities were selected with371 lecturers and 1,330 potential science graduates. Only 296 (80%) of questionnaire copies given to lecturers from 371 were retrieved and 284 (77%) were found usable while for the students' population, 1,265 (95%) were retrieved out of 1330 while 1,259 (95%) were found usable. Employers of labour were given 30 questionnaire copies in which only 26 were retrieved and found usable for the data analysis which represented 87 per cent.

3.4   Research Instruments

Three sets of questionnaire and a key informant semi structured questions were utilised for primary data collection. These were Quality of Academic Curriculum and Employability Skills Questionnaire (QACESQ) for University Lecturers, Quality of Academic Curriculum and Employability Skills Questionnair for potential science gradautes, Employers Rating Questionnaire for employers of Labour and Key Informant Interview (KII) semi structured questions for NUC officials, potential science graduates and employers of labour.

The QACESQ for University management and lecturers had five sections from A to E with 56 items: Section A contained four items on demographic data, Section B contained five items that measured Quality in Academic curriculum on a scale of four: Strongly Agree (SA-4), Agree (A-3), Strongly Disagree (SD-2), Disagree (D-1), Section C has three sub-sections with 15 items that measured adequacy of instructional materials, physical facilities and human resources, which is on a scale of four: Very Adequate(VA-4), Adequate (A-3),Fairly Adequate(FA-2), Not Adequate (NA-1) while Section D contained 18 items on extent of assessment strategies with a Likert scale: Very Large Extent(VLE-4), Large Extent(LE-3), To some Extent(TSM-2) and A little Extent (ALE-1);   and Section E contained 19 items that were structurally designed on the scale of five such as Excellent(E-5), Very Good(VG-4), Good(G-3), Fair(F-2) and Poor(P-1) measuring the methods of teaching science curriculum (Appendix 1 for items on the questionnaire).

The QACESQ for potential science graduates have two sections: Section A consisted of four items namely: type of University, Department, Gender and Age while Section B contained 15 employability skills using Likert scale: Highly Acquired(HA-4),

Acquired (A-3), Somehow Acquired(SA-2) and Not Acquired(NA)-1 was utilized (Appendix 2 for items on the questionnaire).

The employers rating questionnaire for graduates of universities had two parts, A and B. Part A had the background information with the name of organisation, types of industry and state located while Part B contained 15 general attributes/skills that were rated by employers of labour using a 4-point scale: Highly Required (HR–4), Required (R– 3), Less Required (LR–2) and Not Required (NR-1) (Appendix 3 onquestionnaire items).

The KII for NUC officials were six semi structured questions tailored towards the research questions to elicit information from the respondents in their respective professional status. These included their perception of quality in academic curricula, skills that should be embedded in the goals of science; adequacy of instructional resources; assessment strategies of acquisition of employability skills and how to ensure employability skills are embedded in the content of the curriculum. The KII for the employers of labour has a semi structured question on the employability skills required by them and how important they are. The KII for potential science graduates had a question on the employability skills they must have acquired. (See Appendix IV).Key informant interviews (KII) were conducted with 4 officials of the NUC which was purposive in nature. The NUC officials interviewed were recommended from the Office of the Secretary to the National Universities Commission to avoid repetition. Four employers of labour were also interviewed while four group interviews were also held with the potential graduates.

3.5 Validity of the Instruments

Content (face) validity of the three instruments and semi-structured questions were ascertained and subjected to scrutiny by my supervisor; professionals in Education likewise in Management. Copies of the three sets of questionnaire, semi structured questions, research questions and hypotheses were provided for justification of content (face) and construct validity. Their suggestions, criticisms and advice were helpful in drafting the final copies of the questionnaires.

3.6 Reliability of the Instruments

In testing for consistency, copies of QACESQ were administered to 20 lecturers as well as 40 students of Redeemers University, Ede Osun State. Copies of QACESQ for employers of labour were administered in six organisations in Ibadan and Osogbo. The reliability coefficients (r) of the three instruments using Cronbach Alpha were 0.975 for lecturers, 0.798 for potential graduates' questionnaire and 0.764 for employers of labour.

3.7 Administration of the Instruments

Instruments were administered with the assistance of Heads of Departments; Deans of faculties and lecturers alike. A total of 371 'QACESQ' for lecturers were administered, 296 (80%) were retrieved while 284 (77%) were found usable. Also, out of the 1,330 'QACESQ administered to students, 1,265 (95%) were retrieved, while 1,259 (95%) were found usable for the data analysis. The 'ERQ' was administered to 30 organisations and 26 (87%) were returned and found usable. The 'KII' was personally done by the researcher at the National Universities Commission in Abuja on the 23rd of August 2017, while the interviews with potential science graduates, lecturers and employers of labour were done afterwards. All questionnaires were sent out in April, 2017 and the last batch was retrieved in November, 2017.

3.8 Methods of Data Analyses

Data were analysed with frequency counts, mean scores, standard deviations and percentages for research questions 1-4. Also, multiple regressions were used to test hypotheses 4,7, 8 while hypotheses 1, 2, 3, 5 and 6 were tested using Pearson's Product Moment Correlation Coefficient. Moreover, T-test was employed for hypotheses 9, 10, 11 and 12. Hypotheses were tested at 0.05 level of significance. Qualitative data were transcribed manually and thematically.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presented the results obtained from the data analysis, in relation to the four research questions raised and twelve hypotheses formulated respectively:

4.1   Demographic Data of the Respondents

Information on demographic distribution of respondents is presented in Table 4.1.

Table 4.1 Demographic Dataof theRespondents

Items	Frequency	Percentage (%)
Age Range (Years)		
16-20	220	17.5%
21- 25	760	60.4%
26-30	210	16.6%
30 and above	69	5.5%
Total	**1259**	**100**
Gender		
Male	741	58.9%
Female	518	41.1%
Total	**1259**	**100**

Source: Fieldwork (2021)

Table 4.1 showed the age-range of the students sampled for the study. The average age-range was found to be between 21-25 years (60.4%).This implied that majority of the respondents ages' was in the range of 21-25 (60.4%).Table 4.1 also showed the gender of the students sampled for the study. The gender value of respondents indicated that 741 (58.9%) students were male while 518 (41.1%) were female.

4.2 Research question 1: What are the levels of employability skills acquired by potential science graduates in public and private universities in the South-West, Nigeria?

Table 4.2 Levels of employability skills acquired by final year students

Item	Highly Acquired	Acquired	Somehow Acquired	Not Acquired	Mean	Std. Dev
Leadership Skills	688	394	113	64		
	54.6%	31.3%	9.0%	5.1%	3.36	0.845
Interpersonal Skills	503	527	118	41		
	40.0%	41.9%	14.9%	3.3%	3.19	0.803
Problem Solving Skills	478	486	242	53		
	38.0%	38.6%	19.2%	4.2%	3.10	0.855
Presentation Skills	471	526	183	79		
	37.4%	41.8%	14.5%	6.3%	3.10	0.872
Communication Skills (Oral)	430	591	168	70		
	43.2%	46.9%	13.3%	5.6%	3.10	0.830
Analytical Skills	373	531	284	71		
	29.6%	42.2%	22.6%	5.6%	2.96	0.864
Information Technology Skills	3.99	538	240	82		
	31.6%	42.7%	19.1%	6.5%	3.00	0.877
Decision Making Skills	402	615	183	59		
	31.9%	48.8%	14.5%	4.7%	3.08	0.804
Critical Thinking Skills	521	454	242	42		
	41.4%	36.1%	19.2%	3.3%	3.15	0.846
Creativity Skills	493	463	221	82		
	39.2%	36.8%	17.6%	6.5%	3.09	0.906
Teamwork Skills	481	440	253	85		
	38.2%	34.9%	20.1%	6.8%	3.05	0.928
Adaptability Skills	545	421	221	72		
	34.3%	33.4%	17.6%	5.7%	3.14	0.904
Self-Confidence Skills	620	377	199	63		
	49.2%	29.9%	15.8%	5.0%	3.23	0.892
Independence Skills	544	469	159	87		
	43.2%	37.3%	12.6%	6.9%	3.17	0.899
Initiative Skills	535	447	214	63		
	42.5%	35.5%	17.0%	5.0%	3.15	0.878
Weighted Mean = 3.13 (86.69%)						

Note*Mean responses ranged from: 0-1.4= Not Acquired; 1.5-2.4= Somehow Acquired; 2.5-3.4=Acquired; 3.5-4.0= Highly Acquired.   Decision rule = 2.50

Answer to research question one on levels of employability skills acquired bystudents is presented in Table 4.2. The final year science students of the selected universities answered this research question. Their responses on each of the skills are as follows: Leadership Skills: Highly Acquired 54.6%, Acquired 31.3%, 9.0%, Somehow Acquired 5.1%, (mean = 3.36). Majority of the potential graduates revealed that leadership skill was highly acquired by them. This revealed that, most of them must have been involved in one leadership role or another in the course of their study. Others included Interpersonal skills (mean = 3.19); Self-confidence (mean=3.23); Initiative (mean=3.15) against the threshold of 2.50

Results further showed the participants priority for Decision Making Skills with the mean of 3.08.   Teamwork Skills (mean = 3.05) and Information technology (mean=3.00) were fairly acquired. The weighted mean of the Table 4.2 was given as 3.13 that translated into 86.69%, which implied that respondents indicated that they highly acquired employability skills through curriculum implementation to some extent.

4.3 **Research Question 2**: What are the types of employability skills required by employers of labour from university science graduates in the South-West, Nigeria?

Table 4.3 Types of employability skills required by employers of labour

Item	Highly Required	Required	Less Required	Not Required	Mean	Std. Dev.
Leadership Skills	11	7	8	–		
	42.3%	26.9%	30.8%	0.0%	3.12	0.864
Interpersonal Skills	14	11	1	–		
	53.8%	42.3%	3.8%	0.0%	3.50	0.583
Problem Solving	11	14	–	1		
	42.3%	53.8%	0.0%	3.8%	3.35	0.689
Presentation Skills	7	11	8	–		
	26.9%	42.3%	30.8%	0.0%	2.96	0.774
Communication Skills (Oral)	14	10	2	–		
	53.8%	38/5%	7.7%	0.0%	3.46	0.647
Analytical Skills	11	13	1	1		
	42.3%	50.0%	3.8%	3.8%	3.31	0.736
Information Technology Skills	6	11	7	2		
	23.1%	42.3%	26.9%	7.7%	2.81	0.895
Decision Making Skills	8	11	6	1		
	30.8%	42.3%	23.1%	3.8%	3.00	0.849
Critical Thinking Skills	10	13	2	1		
	38.5%	50.0%	7.7%	3.8%	3.23	0.765
Creativity	11	13	1	1		
	42.3%	50.0%	3.8%	3.8%	3.31	0.736
Teamwork	17	8	1	–		
	65.4%	30.8%	3.8%	0.0%	3.62	0.571
Adaptability	12	12	2	–		
	46.2%	46.2%	7.7%	0.0%	3.38	0.637
Self-Confidence	12	12	2	–		
	46.2%	46.2%	7.7%	0.0%	3.38	0.637
Independence	10	12	4	–		
	38.5%	46.2%	15.4%	0.0%	3.23	0.710
Initiative	15	10	1	–		
	57.7%	38.5%	3.8%	0.0%	3.54	0.582
Weighted Mean = 3.29 (71.2%)						

Note*Mean responses ranged from: 0-1.4= Not Required; 1.5-2.4= Less Reqiured;

2.5-3.4=Required; 3.5-4.0= Highly Required. Decision rule=2.50

Table 4.3 presented answers to research question two on the types of employability attributes that potential employers considered being prerequisites in finding employment. The following responses on some of the skills are: Leadership Skills was required by employers of labour with a mean of 3.12 while Teamwork was highly required ((mean = 3.62) as well as Presentation Skills with a mean of 2.96.

Table 4.3 further showed that Critical thinking skill was required to secure a job(mean = 3.23) while Creativity skill was also required by employers of labour (mean = 3.31). Independence Skill on the other hand was also required with a mean of 3.23. The implication of this is that potential graduates are required to carry out a task with minimal supervision.

The weighted mean of Table 4.3 was 3.29 (71.2%) which implied that majority of the employers of labour opined that the listed employability skills are required for entrance of graduates into the labour market.

4.4Research Question 3: What is the quality of academic curricula of public and private universities in the South-West, Nigeria?

Table 4.4 Quality of academic curriculum of universities

Item	SA	A	D	SD	Mean	Std. Dev.
Coherency: Philosophy and values visibly incorporated into the course and linkages.	131 46.1%	96 33.8%	52 18.3%	5 1.8%	3.24	0.811
Relevancy: There is evidence of stakeholders' involvement; learning outcomes serve as clear representation of students' knowledge and abilities.	108 38.0%	112 39.4%	51 18.0%	13 4.6%	3.11	0.857
Rigour: The course content is comprehensive, clear and understandable.	124 43.6%	98 34.5%	59 20.8%	3 1.1%	3.21	0.804
Flexibility: Individual learning needs were recognised with course design that reflects delivery option and diverse assessment Methods.	94 33.1%	111 39.1%	58 20.4%	21 7.4%	2.98	0.913
Currency: There is evidence of use of current knowledge; current industries, field professionals are met appropriately as well as teaching/learning methods are current and appropriate.	107 37.8%	91 32.0%	68 23.9%	18 6.3%	3.01	0.934
Weighted Mean = 3.11 (86.38%)						

Note*Mean responses ranged fromStrongly Disagree (0-1.4);   Disagree (1.5-2.4);

Agree (2.5-3.4); Strongly Agree (3.5-4.0)

From Table 4.4, results showed the quality of academic curricula of Nigerian universities. Findings showed that79.9% of respondents agreed that curriculum of universities was coherent (mean = 3.24); 77.4% of the respondent agreed that the curriculum was relevant with evidence of stakeholders involvement in learning outcomes which served as clear representation of students' knowledge and abilities (mean = 3.11); 78.1% of the respondents agreed that the curriculum course content was comprehensive enough (mean = 3.21); 72.2% of the sampled respondents agreed that the curriculum was flexible i.e. individual learning needs were recognised (mean = 2.98) and 69.8% of the respondents agreed that the academic curricula of universities were current, which means, there was evidence of use of current knowledge; current industries, field professionals are met appropriately as well as teaching/learning methods are current and appropriate (mean = 3.01).The weighted mean of Table 4.4 was given as 3.11 which translated to 86.38% and implied that respondents agreed that the academic curricula of universities were coherent, relevant, rigourous, flexible and current.

4.5 Research Question 4: How adequate are the instructional resources needed for implementation of science curriculum to produce employable graduates in public and private universities in the South-West, Nigeria?

Table 4.5 Adequacy of instructional resources for implementation of science curriculum

Item	Very Adequate	Adequate	Fairly Adequate	Not Adequate	Mean	Std. Dev.
Printed and Duplicated Materials	79	76	120	9		
	27.8%	26.8%	42.3%	3.2%	2.79	0.887
Non- projected Display Materials	33	80	143	28		
	11.6%	28.2%	50.4%	9.9%	2.42	0.821
Still projected display Materials	41	75	109	59		0.966
	14.4%	26.4%	38.4%	20.8%	2.35	
Technological Instructional Media	38	79	105	62		
	13.4%	27.8%	37.0%	21.8%	2.33	0.963
Computed- mediated Materials	52	76	132	24		
	18.3%	26.8%	46.5%	8.5%	2.55	0.886
Spaces: Offices, Classrooms, Lecture Theatres, Resource rooms etc.	57	72	132	23		
	20.1%	25.4%	46.5%	8.1%	2.57	0.900
Equipment: Laboratories, Workshops, Studios	49	77	140	18		
	17.3%	27.1%	49.3%	6.3%	2.55	0.849
Library and Information Management	58	78	135	13		
	20.4%	27.5%	47.5%	4.6%	2.64	0.857
Academic Staff: Lecturers/ Ranks	63	73	73	20		
	22.2%	25.7%	25.7%	7.0%	2.63	0.906
Non-Academic: Technical & Administrative Staff	71	70	123	20		
	25.0%	24.6%	43.3%	7.0%	2.68	0.929
Weighted Mean = 2.55 (89.64%)						

Note*Mean responses ranged from: 0-1.4=Not Adequate; 1.5-2.4=Fairly Adequate;

2.5-3.4=Adequate: 3.5-4.9= Very Adequate

Table 4.5 indicated the answer to research question four on instructional tools sufficiencyfor implementation of science curriculum to produce employable science graduates.The results showed the following instructional materials: Printed and duplicated materials: Very Adequate 27.8%, Adequate 26.8%, Fairly Adequate 42.3%, Not Adequate 3.2%, (mean = 2.79); Non- projected display materials: Very Adequate 11.6%, Adequate 28.2%, Fairly Adequate 50.4%, Not Adequate 9.9%, (mean = 2.42); Still projected display materials: Very Adequate 14.4%, Adequate 26.4%, Fairly Adequate 38.4%, Not Adequate 20.8%, (mean = 2.35); Still projected display materials: Very Adequate 13.4%, Adequate 27.8%, Fairly Adequate 37.0%, Not Adequate 21.8%, (mean = 2.33); Computed- mediated materials: Very Adequate 18.3%, Adequate 26.8%, Fairly Adequate 46.5%, Not Adequate 8.5%, (mean = 2.55).

Table 4.5 further showed responses of the Physical facilities: Spaces: Offices, Classrooms, Lecture Theatres, Resource Rooms etc.: Very Adequate 20.1%, Adequate 25.4%, Fairly Adequate 46.5%, Not Adequate 8.1%, (mean = 2.57); Equipment: Laboratories, workshops, studios, among others, Very Adequate 17.3%, Adequate 27.1%, Fairly Adequate 49.3%, Not Adequate 6.3%, (mean = 2.55); Library and Information: Very Adequate 20.4%, Adequate 27.5%, Fairly Adequate 47.5%, Not Adequate 4.6%, (mean = 2.64).

Academic Staff: Lecturers/ Ranks: Very Adequate 22.2%, Adequate 24.6%, Fairly Adequate 43.3%, Not Adequate 7.0%, (mean = 2.63); and Non-Academic: Technical & Administrative staff: Very Adequate 25.0%, Adequate 24.6%, Fairly Adequate 43.3%, Not Adequate 7.0%, (mean = 2.68).

The weighted mean of Table 4.4 was given as 2.55 which translated to 89.64% and impliedthat instructional materials like non-displayed materials, still displayed materials and technological instructional mediawere not adequate in the universities; while physical facilities and human resources were fairly adequate.This indicated that the listed instructional resources were averagely adequate in teaching science courses in the universities. Without instructional resources in the universities, the goals of the curriculum will not be appropriately achieved.

4.6Hypothesis1: There is no significant relationship between instructional materials and acquisition of employability skills among potentialgraduatesof universities in the South-West, Nigeria.

Table 4.6 Relationship between instructional materials and employability skills

Variable	Mean	Std Deviation	N	r	P Value	Remark
Instructional Materials	15.549	3.619	284			
Employability Skills Acquired by PotentialGraduates of universities	41.089	10.7556	284	0.588	0.012	*Sig

Sig. at 0.05level

Table 4.6 presented the analysis of hypothesis one testing for the relationship between instructional materials and employability skills acquired by potential graduates.Findings showed a substantial nexus of the instructional materials with employability skills acquired by potential graduates (r = 0.588; P < 0.05). Therefore, the null hypothesis is not accepted. It indicated thatrelationship between instructional materials and employability skills acquired by potential graduates were significant. The mean value of instructional materials was given as 15.549 while that of employability skills acquired by potential graduates of universities was 41.089. The variable deviations included 3.619 and 10.7556 respectively.

4.7 Hypothesis 2: There is no significant relationship between physical facilities and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

Table 4.7 Relationship between physical facilities and employability skills

Variable	Mean	Std Deviation	N	r	P Value	Remark
Physical Facilities	40.103	9.633	284	0.684	0.000	*Sig
Employability Skills Acquired by Potential Graduates of universities	41.089	10.756	284			

Sig. at 0.05level

The results of Hypothesis Two showed the association of physical facilities with employability skills acquired by potential graduates in Table 4.7.Findings showed that the relationship between physical facilities and employability skills acquired by potential graduates was significant (r = 0.684; P < 0.05). From Table 4.7, the mean values of physical facilities and employability skills acquired by potential graduates 40.103 and 41.089 while variables' deviationsincluded 9.633 and 10.756. The findings showed rejection of the null hypothesis atthe significant level of 0.05. This implied that the relationship between physical facilities and employability skills acquired potential graduatesof universities were significant.

4.8Hypothesis 3: There is no significant relationship between human resources and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

Table 4.8 Relationship between human resources and employability skills

Variable	Mean	Std Deviation	N	r	P Value	Remark
Human Resources	40.8172	10.1609	284			
Employability Skills Acquired by Potential Graduates of universities	41.089	10.7556	284	0.696	0.008	*Sig

Sig. at 0.05level

Table 4.8 presented the analysis of hypothesis three formulated on the correlation of workforce withacquisition of employability skills among university science students. Findings showed a substantial connection of human resources with employability skills acquired by university science students, ($r = 0.696$; $P < 0.05$). Therefore, the null hypothesis was not accepted. The indication is that, relationship between human resources and employability skills acquired by potential graduates of universities were significant. The mean value of human resources was 40.103 while that of employability skills was 41.089. Variables deviations included 10.1609 and 10.7556 respectively.

4.9Hypothesis 4: There is no significant joint relationship between instructional resources (instructional material, physical facilities, human resources) and employability skills acquired by potential graduates of universities in the South–West, Nigeria.

Table4.9 Regression analysis of variables and employability skills

Model	Sum of Squares	Df	Mean Square	F	Sig	Remarks
Regression	19823.920	3	6607.973	146.373	0.000	Sig.
Residual	12234.262	271	45.145			
Total	32058.182	274				

R = 0.786

R Square = 0.618

Adjusted R Square = 0.614

Std. Error of the Estimate = 6.71899

Table 4.9presented the analysis of hypothesis four on joint relationship between instructional resources (instructional material, physical facilities, human resources) and employability skills acquired by potential graduates of universities in the South–West, Nigeria. It showed that employability skills acquired by potential graduates had joint significant relationship with instructional resources (instructional material, physical facilities, human resources) (R = 0.786; P<0.05). The coefficient of determination (Adjusted R Square = 0.618) showed that 61.8% of the total variations in employability skills acquired by potential graduates which accounted for the change in the independent variables ofinstructional resources (instructional material, physical facilities, human resources).

The linear combination of all the predictor variables were found to have significant joint relationship with employability skills acquired by university science students ($F_{(3,271)}$ = 146.373); P < 0.05. Hence, at 0.05 level of significance, the null hypothesis was not accepted. The implication is,instructional materials, physical facilities and human resources had joint significant relationship with employability skills acquired by potential graduates of universities in the areas investigated.

4.10 Hypothesis 5: There is no significant relationship between the methods of teaching science courses and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria

Table 4.10 Relationship between the methods of teaching and employability skills

Variable	Mean	Std Deviation	N	R	P Value	Remark
Methods of Teaching Science Courses	25.500	7.0803	284	0.544	0.004	*Sig
Acquisition of Employability Skills	41.089	10.7556	284			

Sig. at 0.05level

Table 4.10 presented the analysis of hypothesis five on the relationship betweenmethods of teaching science courses and acquisition of employability skills among potential graduates of universities in the South-West geo-political zone. Findings showed a substantial correlation of the methods adopted in teaching science courses with acquisition of employability skills among potential graduates ($r = 0.544$; $P < 0.05$). Therefore, the null hypothesis was not accepted. The indication was that,the relationshipbetween teachingmethods in science courses and acquisition of employability skills was significant. The mean value of methods of teaching science courses was 25.500 while that of acquisition of employability skills was 41.089.

4.11 Hypothesis 6: There is no significant relationship between assessment strategies and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria.

Table 4.11 Relationship between assessment strategies and employability skills

Variable	Mean	Std Deviation	N	r	P Value	Remark
Assessment Strategies	40.8172	10.16088	284			
				0.696	0.010	*Sig
Employability Skills	41.0887	10.75558	284			

Sig. at 0.05level

The analysis of Hypothesis Six on relationship between assessment strategies and acquisition of employability skills among potential graduates of universities was presented in Table 4.11. The result revealed a significant association of assessment strategies with employability skills (r = 0.696; P < 0.05). Therefore, the nullhypothesis was not accepted. The indication being that, assessment strategies had significant relationship with the employability skills of potential graduates of universities in the areas of investigation.

4.12 Hypothesis 7: The relative contributions of Instructional resources (instructional material, physical facilities, human resources), methods of teaching, assessment strategies to employability skills development among potential graduates of universities in the South West, Nigeria is not significant.

Table 4.12 Relative contributions of instructional resources to employability skills

	Independent Variable	Unstandardized Coefficient B	Std. Error	Stand. Coefficient Beta Contribution	t	P value	Sig.
	(Constant)	1.731	1.949		1.684	0.000	
Employability	Instructional Materials	0.218	0.097	0.195	2.238	0.026	Significant
Skill	Physical Facilities	0.228	0.087	0.214	2.623	0.009	Significant
Development	Human Resources	0.052	0.078	0.034	0.673	0.000	Significant
	Methods of Teaching	0.275	0.032	0.499	8.677	0.012	Significant
	Assessment Strategies	-0.008	0.189	-0.003	-0.45	0.964	Not Significant

Table 4.12 showed the relative contributions of the independent variables on the dependent variable. From the results displayed, each of the five indicators of quality academic curriculum made individual contribution to the prediction of perceived employability skills of potential graduates. The result indicated beta weights representing the relationship of independent variables to the prediction of dependent variables: instructional materials($\beta = 0.195$, $t=2.238$; $P < 0.05$); physical facilities ($\beta = 0.214$, $t=2.623$; $P < 0.05$), human resources ($\beta = 0.034$, $t=0.673$; $P < 0.05$), methods of teaching ($\beta = 0.499$, $t=8.677$; $P < 0.05$) and assessment strategies ($\beta = -0.0038$, $t= -0.45$; $P > 0.05$). The results showed that while instructional materials, physical facilities, human resources, methods of teaching were significant with employability skills development among potential graduates of universities in the South-West, Nigeria, and assessment strategies was not significant. This implied that assessment strategies had negative contribution to employability skills development among potential graduates.Table 4.12 showed that methods of teaching had the highest contribution to employability skills development among potential graduaes ($\beta = 0.499$) which was followed by physical facilities, ($\beta = 0.214$), instructional materials, ($\beta = 0.195$) and human resources ($\beta = 0.034$).

4.13 Hypothesis 8: There is no significant joint prediction of instructional resources (instructional material, physical facilities, human resources), methods of teaching, assessment strategies on acquisition of employability skills among potential graduates in the South–West, Nigeria

Table 4.13 Joint prediction of independent variables on employability skills

Model	Sum of Squares	Df	Mean Square	F	Sig	Remarks
Regression	23271.627	5	3878.604			
Residual	8786.555	269	32.786	118.302	0.008	Sig.
Total	32058.182	274				

R = 0.852

R Square = 0.726

Adjusted R Square = 0.720

Std. Error of the Estimate = 5.72588

Table 4.13 presented the analysis of hypothesis eight on joint prediction of instructional resources (instructional materials, physical facilities, human resources), methods of teaching, assessment strategies on acquisition of employability skills of potential graduates of universities in the South–West, Nigeria. It was found from Table 4.13 that instructional Resources (instructional material, physical facilities, human resources), methods of teaching, assessment strategies had joint significant prediction of employability skills of potential graduates of universities (R = 0.852; P< 0.05). The coefficient of determination (Adjusted R Square = 0.720) showed that 72.0% of the total variations in employability skills of potential graduatesaccounted for the change in the independent variables (instructional material, physical facilities, human resource), methods of teaching, assessment strategies).

The linear combination of all the predictor variables were found to have joint significant prediction ofemployability skills of potential graduates of universities($F_{(5, 269)}$ = 118.302); P < 0.05. Hence, the null hypothesis was not accepted at 0.05 level of significance. This implied that instructional material, physical facilities, human resources, methods of teaching, assessment strategies had joint significant prediction of employability skills of potential graduates of universities in the South-West, Nigeria.

4.14Hypothesis 9: There is no significant difference between employability skills acquired by students in public and private universities in the South-West, Nigeria

Table 4.14 T-test of differences in employability skills acquired by students

Variable	N	$\overline{X}$	SD	t	Df	Sig	Rmk
University: Public	989	47.07	6.7412				
Private	270	46.13	6.2397	2.050	1257	0.030	Sig.
Acquired Employability Skills	1259	18.36	10.167				

Sig at 0.05 level

Table 4.14 showed the analysis of hypothesis nine on the differences in the employability skills acquired by potential graduates in public and private universities. It showed that students acquired employability attributes with discrepancy for bothpublic and private universities (t = 2.0504; df = 1257; P < 0.05), then, the null hypothesis was not accepted. This implied that a discrepancy of substantial value existed with the attributes acquired by students in private and public universities.

4.15Hypothesis 10: There is no significant difference between the adequacy of instructional resources (instructional materials, physical facilities, human resources) in public and private universities in the South-West, Nigeria.

Table4.15 T-test of differences in adequacy of instructional resources

Variable	N	$\overline{X}$	SD	t	Df	Sig	Rmk
University: Public	214	15.89	4.0123				
Private	70	12.91	3.8731	0.8162	282	0.014	*Sig.
Adequacy of Instructional Resources	284	16.04	2.9512				

Significant at 0.05 level

Table 4.15 presented analysis of the discrepancy inadequacy of instructional resources in private and public universities. Findings showed a substantial varianceofinstructional resources in South-West universities, (t = 0.8162; df = 282; P < 0.05), then, the null hypothesis was not accepted at 0.05 level of significance. This implied that a variance existed inadequacy of instructional resources in South-West universities. From Table 4.15,instructional resources were more adequate in public universities (mean = 15.89) than in private universities (mean = 12.91).

4.16 Hypothesis 11: There is no significant difference in the methods of teaching science courses in public and private universities in the South-West, Nigeria

Table 4.16 T-test of differences in the methods of teaching science courses

Variable	N	$\overline{X}$	SD	t	Df	Sig	Rmk
University: Public	214	57.13	20.0777				
Private	70	66.61	16.0400	4.024	282	0.002	Sig.
Methods of Teaching Science Courses	284	18.36	10.167				

Sig at 0.05 level

The analysis of hypothesis eleven on the disparity in the methods of teaching science courses in privateand public universities in the South-West was presented in Table 4.17. Results showed a variance inmethods applied in teaching science courses in private and public universities in South-West (t = 4.024; df = 282; P < 0.05). Therefore, the null hypothesis was not accepted.

4.17 Hypothesis 12: There is no significant difference in the assessment strategies used in public and private universities in the South-West, Nigeria.

Table 4:17 T-test of differences in the assessment strategies used

Variable	N	$\overline{\text{X}}$	SD	t	Df	Sig	Rmk
University: Public	214	43.31	10.8951				
Private	70	51.24	9.9162	5.404	282	0.012	Sig.
Assessment Strategies	284	45.26	11.1826				

Sig at 0.05 level

T-test showing the differences in the assessment strategies used in public and private universities in South-West (Table 4.17). Findings indicated avariance in the assessment strategies used in private andpublic universities in South-West (t = 5.404; df = 282; P < 0.05), hence, the null hypothesis was not accepted at 0.05 level of significance. Findings showed the variance in assessment strategies used in private and public universities in theSouth-West, Nigeria.

4.18   Discussion of Findings

Research Question one sought to investigate the levels of employability skills acquired by potential graduates in public and private universities in the South-West, Nigeria; it was found that, majority (86.69%) of the respondents highly acquired employability skills through curriculum implementation.Results also showed that the potential graduates identified leadership skill among other skill as the most acquired skill with a mean of 3.36 followed by self-confidence skill (3.23) and that with a weighted mean of 3.13, respondents indicated highly acquired employability skills.The study of Weligamage (2009) was corroborated by this finding which showed that trainers were highly satisfied with performance in verbal and written communication skills as well as with abilities to make choices. In contrary, areas such as writing skills, decision making and analytical skills still needed to be improved upon.

Adeyemo, Ogunleye, Oke and Adenle (2010), in their empirical study with managers of public enterprises, private firms and professional associations using also 100 science graduates working in various establishments, found that universities are not producing graduates with appropriate skills required of twenty-first century world economy controlled largely by information technology. Their findings showed only four of the skills being rated namely problem solving, ICT, self-directed and analytical skills which confirms that efforts are still being placed on theory over practical in universities. This study supported the empirical work of Adeyemo et al on skills acquired which was in line with quality enhancement model because; standard delivery system of a planned content gives room for the achievement of desired objectives (employability skills). This, in turn, provides avenue for feedback whether the process is working rightly or not.

In the same vein, Asuquo and Agboola (2014) found that Nigerian graduates employability is poor outrightly. It means that, the NUC and other relevant authorities revise or upgrade university curricula in order to reflect the present reality. On the other hand, Oyebade and Adedeji (2014) reiterated that education system in higher institutions is highly deficient with out-dated and irrelevant curricula prepared some 30 years ago. Graduates are being over-fed with pure academic theories with no creativity, but learning methods that only promote crude cramming. This therefore, led to inability to acquire skills needed for good employment and so the curriculum needed to be upgraded to

quality standards that enhance acquisition of relevant soft skills and readiness for the job market.

Besides, potential graduates interviewed on the attributes acquired in their course of study, had these to say: "So far so good, I have been able to think like a scientist-I meant analytical thinking and also being able to work with others successfully through our group projects as well as my information technology skill had improved tremendously"- Computer science student, private university. Also, a Biochemistry student of a private university stated that "I would tell you that had been able acquire leadership skill in which I know the attributes of a leader. I am also creative to some extent, and my self-confidence to face any situation is what I am really proud of". In the same vein, a Physics student from a public university reiterated that "I use my initiative most times to work on my laboratory works and I work independently to get results not all the times but sometime". In addition, another potential graduate from Zoology Department in a public university said "My communication skill as well as presentation skill has really improved. However, I am still working on my adaptability skill"- Zoology student, public University. From the interview conducted, it showed that, most of the attributes were gained by the students.

Research Question Two dwelt on ascertaining the types of employability skills required by employers of labour from potential graduates, showed that, majority (71.1%) of the employers of labour submitted that the listed employability skills are required for entrance of graduates into the labour market. Employers of labour sees teamwork as the most required skill for entrance into the labour market having an average value to be 3.62, and interpersonal skills (mean= 3.50). Therefore, it is imperative for every university to include all the listed skills in their curricula.

The study of Knight and Yorke (2006) was corroborated by this finding in that since the role of tertiary institutions is to produce the required high-level human resources for sustainable economy, it is very necessary that universities should focus on curricula development and adjustment of course content towards employers' needs. Good curriculum that takes into consideration employers' needs will go a long way in assisting learners to acquire constructive skills. However, Clark (2001) suggested the need for

universities to periodically update their curricula in order to accommodate fast advancing frontier of scientific knowledge.

In the same vein, in the United Kingdom, a positive effect of curriculum was recorded on employment outcomes as well as employers' commitment when designing and delivering, with little effect on teaching of employability skills at departmental level (McCowan, 2014). In contrary, in Nigeria, Oyekan (2012) stressed the importance of qualitative improvement and expansion of tertiary institutions knowledge and skills required in contemporary economic activities which can only be imparted and expanded at the higher level of education. Similarly, the studies of Olofintoye and Prince (2013), and Asuquo and Agboola (2014) emphasised that most graduates find it difficult to match knowledge acquired in school with labour market demands, and that Nigerian universities graduates lack job-related skills which often lead low performance. Irwanto (2015) therefore, analysed the main skills that needed to be developed to face the world of work in 21st century to include problem solving skills, communication skills, creative and analytical thinking skills which were noted in the previous studies of Fatmawati (2014) and Hastuti (2014).

The findings, as well as the literature on importance of employability skills for graduates' entrance into the labour market were corroborated by the employers of labour and the NUC officials interviewed. Employer A stated that "every employer looks for an applicant that is not only brilliant but he or she is able to use initiative, get jobs done with minimal supervision and, most importantly, being a team player. These attributes are highly required by any employer". In support of this, Employer B affirmed that "to employ a job seeker in our company, we test for critical thinking and analytical thinking through the questions we give them to answer. Also, an applicant must be able to communicate orally very well, solve problems accurately, and must be creative. We need these skills and others from our prospective employees". In addition, Employer C added that "information technology skill sometimes is important because the world is becoming a global village and any of our employees must be able to adapt to any given situation in this organisation. Not only that, we want to see that self-confidence right from the first day of applying for a job with us. Above all, the potential graduate must be able to interact with others very well. This is important to keep this company moving forward.

All skills mentioned will be highly required by any employer that wants his or her organisation to progress". In the same vein, Employer D stated that " I would love to employ a candidate that will make things work and moving if I have to be absent from the office for a few days, I mean someone who has a good leadership skill and can use his initiative". Equally, Respondent A from the NUC, said that "employability attributes are germane to employers of labour in the sense that without those skills, it might be almost impossible for a fresh graduate to secure a job putting aside other factors that interfere with being employed. In the same vein, Respondent B stated that 'the NUC has what is called the graduate assessment scheme.

Respondent B further stated that "the need assessment scheme is a project whereby the Commission would visit some selected public and private universities.This is where the assessment of their graduates is being carried out. We visit industries, interact with their products, since there is university–industry linkage. We interact with these graduates, what the employers think and what the universities need to take care of. And when it comes to the curriculum, those things are being annexed, packaged and integrated into the curriculum again. And that is why curriculum is not sancrosanct, it is subject to review".

In addition, Respondent C submitted that "the NUC expected the students to have some skills which the curriculum supposed to have. These include problem solving ability, creativity, initiative, process skills and many more. What the in-depth knowledge of all courses is about, behavioural attributes to make sure the students acquire the skills because they are in the BMAS". Respondent D concluded by saying that "because of the importance of employability skills to the employers of labour, which is the more reason for having Need Assessment Scheme by the NUC". The interviews conducted found that employers of labour do value employability skills and the skills are highly required by them. Without the graduates possessing combinations of these skills, it might be very difficult for them to get a job of their choice.

Research Question three sought to establish the quality of academic curriculum of universities in the South-West, Nigeria. It was found that the curriculum used in the universities is fairly current while inquiry method is broadly used.The answer to research question three lends credence to the studies conducted by Camosun College Centre for

Excellence in Teaching and learning (2017); (UNESCO, 2016b) & (Dirk, 2019). All the authors laid emphasises on quality of a good curriculum to include coherence, relevance, rigour, flexibility and currency. They believed strongly that quality in curriculum promoted attitudes and responsible citizenship values. This is needed in fostering creative and emotional development. It would show the extent of complexity involved in curriculum and testing of it which included relevance, conformity, exclusiveness and excellence. Quality must be ensured and maintained through accreditation exercises and resource verifications.

On the other hand, Garvin (1987) categorised quality to include performance, reliability, conformity, and serviceability which are all elements of a good curriculum while Georgiadou (2016) measures quality with inherent characteristics which is the metaphysical aspect of quality. A coherent academic curriculum must be relevant to students' needs with comprehensive, understandable content as well as being elastic to accommodate changes at any point in time. Also, the use current knowledge coupled with current teaching/learning methods will produce not only university graduates but also graduates with good learning outcomes, behavioural attributes and skills to attract employers of labour.

In line with the answer to the research question three and the literatures establishing it, Respondent A interviewed at the NUC, stated that "quality in academic curriculum is when the active curriculum is in consonance with the best global practices". Respondent B viewed quality in academic curriculum as "making sure that the NUC benchmark is being upheld at all times and that while universities can go above the set standard, they cannot go below it". Respondent C however, mentioned that "when we talk about quality, it means something of good standard, good package and a good product and so with academic curriculum, it is good curriculum, curriculum that is of high standard and standard here is about the minimum academic standard". To buttress the other respondents, Respondent D concluded that "quality in NUC is the benchmark which prescribes the outline of what a student should know, who must have been through the Nigerian University system should acquire all these things, and the skills needed so that a student can call himself or herselfa graduate at the end of the day. So also, quality is ensured and maintained through accreditation exercise and resource verification".

Research Question four examined how adequate the instructional resources needed for implementation of science curriculum to produce employable graduates in public and private universities in the South-West, Nigeria. It was found that there were inadequacies of instructional materials used in the universities while the physical facilities and human resources were fairly adequate considering the weighted mean of 2.55. These findings corroborated the study of Bamiro and Adedeji (2010) in which resource allocation in higher education was among the emerging issues mentioned. This was as a result of problems related to distribution and deployment of educational materials, qualities and quantities of materials available to educational institutions, which determines to a large extent the performance. In the same vein, Okoro (2008, 2011) indicated lack of amenities to execute science oriented contents whileTuimur and Chemwei (2015) are of the opinion that if these materials were not adequately supplied, teachers should intervene by improvising.

Abolade (2010) ascertained that, quality and quantity of knowledge acquired by potential graduates were consistent with quality and effectiveness of the instruction.The conclusion was made by categorising materials into three- Print, non- print materials and community resources which are most sought after by curriculum implementers in achieving the goals. In addition, the quantity of materials must correlate with the number of students and adequacy of instructional materials is very important in implementing goals of curriculum. Lack of instructional materials in science classroom setting had been a significant problem in Nigerian education system (Wambui, 2013). In the same vein, Afework and Asfaw (2014) and Adeyanju (2002) stressed the need to have all the amenities to pass the information the learners are supposed to have because they enhance students' academic achievement.

Likewise, Eshiwani (1984), Ayot and Briggs (1992), Adeogun (2010), Likoko, Mutsoso and Nasongo (2013), Lahina (2017) found a positive association of learners' accomplishments existing with colleges that have sufficient tools and did well with the others having little or no tools. The authors confirmed the kinds of tools to pass information to students being significant, owing to having it as a basis for conceptual thinking. Also, all the authors professed resource materials such as textbooks brings about the teaching of the subject in an intangible form. On the other hand, Muthamia

(2009) asserted that these instructional materials in most cases are lacking and can lead to abysmal performance on the part of the teachers. Also, Hakielimu (2008) and Laddunuri (2012) established with the colleges under study having non-existing amenities, tools to pass across information needed by learners that included workrooms, equipment, sitting areas for students among others. This had put a stop to improvement in learners 'attainments' focus. In the same vein, Mukhar (2007) and Babatope (2010) attributed the nexus of the content in promoting the economy and the worries exhibited by the society on the worth of individuals being turned out of institutions to lack infrastructure.

In terms of the physical facilities, Vidalaski, Sun and Papa (2013) stated that the performance of any institution of higher learning will depend on the provision and value for facilities because facilities in education are related to students' performance and vice-versa. Kapinga (2017) also acknowledged the importance of physical facilities as a factor in both attendance and achievement. On the other hand, Nirav (2010); Syakima, Sapri and Shahril (2011); Khan and Iqbal (2012); Ibrahim, Osman, Bachok and Mohammed (2016); Isa, Yussouf and Gwamma (2017) laid emphases on the adequacy of provision of physical facilities at all levels of education while Mackatiani (2017) stated that without physical facilities, effective learning cannot be realised. Similarly, Akomolafe and Adesua (2016) are of the opinion that if schools do not have adequate facilities that will match enrolment rate, teaching and learning processes may invariably be adversely affected. Ogunniyi (1982) acknowledged laboratories as germane to any information to be passed across to students in science, the more reason for Adedeji 1998 to have put up an argument on supply of working and sufficient amenities in schools. Nwankwo (1982) and Adewunmi (2000) also showed how learners' accomplishments are determined by sufficient and obtainable amenities while Ajayi (2000) opined that facilities in the school system also boost teachers' job performance. Odeh et al (2015) singled out a promoting element in learners' attainments as presence of amenities at schools. However, Owoeye and Yara (2011) have no proven facts that gigantic and sometimes unaffordable physical facilities can produce what learners are to achieve in the course of going to school.

Furthermore, in human resources, Ekankumo and Kenebaradikumo (2011) maintained that both quality of teaching and the teachers will depend on their professional development. Unwin (2015) acknowledged that qualified teachers that are

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committed to do their jobs will produce students who will be absorbed into the labour market. In order for the academics to produce students that are employable, Blaxell and Moore (2012) asserted that the teachers must demonstrate and use all their skills and methods to teach the students, so that students will purposefully develop their own skills and attributes. Similarly, Onyeike and Onyeagbako (2014) stated that the type and strategies of organisation affects human resource planning in that if organisation promotes human resources in all ramifications, efficiency and quality output will also be promoted from the side of the workers. However, Bamiro and Adedeji (2010) are of the view that perhaps, if resources (human) are inadequate, and the available ones are not efficiently managed, it can lead to poor quality of university graduates.

In view of the findings from Research Question four and the literature, respondents interviewed at the NUC, referred to the BMAS resource requirement for all Nigerian universities to include physical and human materials. They emphasised that the resources must be very adequate in order to meet students' needs since they are being prepared for the global world and "without these resources available in the universities, the goals will not be appropriately achieved and graduates might find it difficult to acquire stated BMAS learning outcomes". They further stated that "instructional resources are essential drivers of curriculum. Adequate provision must be made for these resources so that students can acquire the knowledge needed".

Hypothesis one stated that, no significant relationship existed between instructional materials and acquisition of employability skills among potential graduates in the South-West, Nigeria was not accepted based on the result of the analysis. Finding showed that significant relationship existed between instructional materials and employability skills. The finding of this study confirmed the accuracy of Quality Enhancement Model by Georgiadou (2016) which is adopted in this study.This finding corroborated the study of Afework and Asfaw (2014) which reiterated that, if instructional tools are not provided, to teach might not be worthwhile and learners will not gain the information needed and that student textbook, teacher's guides' reference books and maps enhance students' academic achievement. Likewise, Effiong and Igiri (2015) explained that instructional materials contribute significantly to teaching and learning process. These materials enhance students' memory.Furthermore,Wambui

(2013) emphasized that the number of students must match the amount of tools provided to learn and that ensuring of adequacy of instructional materials means the science oriented subjects will pay more attention to those that are ready to learn rather not those that teach. Equally,Lahina (2017) is of the opinion that, these amenities and tools create the foundation for the students to be able to reason better and that the learners function well in recalling all that has been taught. Wambui (2013) stressed further that the quality of curriculum given to students rested on availability and sufficiency of instructional materials.

On the other hand, Adeogun (2010) found a significant nexus occurring with learners' accomplishments and tools being employed to teach.Author concluded with colleges that have sufficient tools did well more than the others having little or no tools. Adeogun (2010) also revealed that materials are not provided enough as they ought to be at most of the government controlled post primary institutions. Eshiwani (1984) in Likoko et al (2013) acknowledged facilitating better ways of passing information and for learners to understand what is being taught, resources (subject teachers, books) must be provided to make the course interesting. Muthamia (2009) stated, in as much as those that engage in teaching the learners want to bring new ideas into what they teach, resources required to do so must be provided and sufficient in number. Interestingly, these instructional materials in most cases are lacking and this leads to abysmal performance on the part of the teachers.

Furthermore, Ayot and Briggs (1992) pointed to amenities and tools provided for schools being an envisaging element in the outcome of what is being taught. The availability of these materials is sine-qua-non for effective and efficient implementation of programmes and curriculum; therefore materials must be adequate and provided for as required. Bamiro and Adedeji (2010) asserted that resource allocation in higher education is among the emerging issues in current literature. This is because many problems of schooling are related to allocation and utilization of educational resources. They stressed further that quantities and qualities of resource available to any educational institution will determine system performance. They are of the view that perhaps, inadequate resources and inefficient utilization of the available resources could be the major factor responsible for this poor quality of graduates, which has consistently been at an alarming

rate and had led to discontentment and disappointment among the education stakeholders in Nigeria.

The second hypothesis of no significant relationship existing between physical facilities and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria was not accepted. The result showed the relationship between physical facilities and employability skills was significant.This findings corroborated the findings of Ayoo (2000) in Kapinga (2017)stated that areas where students are taught, furniture, where students can look-up for information as well as conveniences are vital to students' accomplishment. It was also assumed that, facilities have great positive impact on what is taught which in turn determines how well a student will perform.

Similarly, Nirav (2010) stated, where the students learn, must be given priority and an adequate number of classrooms should be provided. Laboratory, an essential part of school should be adequately equipped. Learning theoretically might not be enough to have the abilities required unlike getting involved with more practicals. This is more reason for Ibrahim, Osman, Bachok and Mohammed (2016) to have identified services that must be sufficient in number and maintained accordingly. Ogunniyi (1982) acknowledged laboratories as germane to any information to be passed across to students in science, the more reason for Adedeji 1998 to have put up an argument on supply of working and sufficient amenities in schools.

Corroborating Ogunniyi and Adedeji, Adewunmi (2000) showed a correlation of obtainable physical and students' accomplishmentswhile Ajayi (2000) emphasised the essence of providing enough amenities to help the instructors do their work better. Nwankwo (1982) also showed how learners' accomplishments are determined by sufficient and obtainable amenities.

On the other hand, Adeboyeje (1984), Adedeji (1998), Owoeye (2000) and Ajayi (2002) in Ekundayo (2010) asserted that, there is a substantial nexus of how well the learners are doing and college amenities. Equally, Bakari, Likoko and Ndinyo (2014) explored the presence of impact of amenities on students' excellence in some government controlled institutions and the findings showed that learners' accomplishments were better over a period of time with sufficient resources. Also, schools with deficiency in what it takes to aid students' learning swayed with time despite new reforms to meet the

societal expectation needs in Kenya. In support of this, Odeh, Oguche, Ivangher and Dondo (2015) highlighted some facilities as supporting systems for students' attainments in any learning environment as different structures, workrooms, materials needed to occupy open spaces for workers and learners' alike, sitting areas, where learners look-up for information among others.

In the same vein, Oyedeji (2012) in Isa, Yussouf and Gwamna (2017) asserted that facilities provided for learning are reflections of the value attached to stages and processes involved, therefore, physical facilities need to be adequately provided and utilised towards student academic performance. However, Owoeye and Yara (2011) have no proven facts that gigantic and sometimes unaffordable physical facilities can produce what learners are to achieve in the course of going to school.

Hypothesis three which stated that,there is no significant relationship between human resources and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria wasnot accepted. The findings showeda significant relationship existed between human resources and employability skills.This findings corroborated the study of Ekankumo and Kenebaradikumo (2011) that showedthe lecturers and teaching standards depended to some extent on their professional development. Qualified lecturers that are committed to do their jobs will produce students who would be absorbed into the labour market (Unwin, 2015). Students' demonstration of skills acquired to potential employers before being offered a job is crucial. Blaxell and Moore (2012) on the other hand, asserted that academics must demonstrate and use all their skills and methods to disseminate information to students for purposive development of skills and attributes. They further stressed that one possible way of doing this can be through the use of high quality portfolio. This will allow the students to showcase their skills developed while in school and that the academics as well as curricula designers must look into opportunity of providing the students to develop skills and attributes. However, Bamiro and Adedeji (2010) were of the views that perhaps, if resources were inadequate and the available ones are not efficiently managed, this could contribute to the production of poor quality university graduates.

Analysis of hypothesis four on joint relationship between instructional resources (instructional material, physical facilities, human resources) and employability

skillsacquired by potential graduates of universities in the South–West, Nigeria, showed the hypothesis was not accepted. The findings showed that employability skills acquired by potential graduates of universities have joint significant relationship with instructional materials, physical facilities and human resources.Equally, Adeogun (2010) found a significant nexus occurring with learners' accomplishments and tools being employed to teach.The author concluded with colleges that have sufficient tools did well more than their counterparts that did not.Adeogun (2010) also found that materials are not provided enough as they ought to be at most of the government controlled post primary institutions. Eshiwani (1984) in Likoko et al (2013) acknowledged facilitating better ways of passing information and for learners to understand what is being taught, resources (subject teachers, books) must be provided to make the course interesting. Muthamia (2009) stated, in as much as those that engaged in teaching the learners want to bring new ideas into what they teach, resources required to do so must be provided and sufficient in number. Interestingly, these resources in most cases are lacking and can lead to abysmal performance on the part of the teachers.

Furthermore, Ayot and Briggs (1992) pointed to the amenities and tools provided for schools being an envisaging element in the outcome of what is being taught. The availability of these materials is sine-qua-non for effective and efficient implementation of programmes and curriculum. Therefore resources must be adequate and provided for as required. Bamiro and Adedeji (2010) asserted that resource allocation in higher education was among the emerging issues in current literature. This is because; many problems of schooling are related to allocation and utilization of educational resources. They stressed further that quantities and qualities of resource available to any institution will determine system performance. They are of the view that perhaps, inadequate resources and inefficient utilisation of the available resources could be the major factor responsible for the poor quality of graduates, which has consistently been at an alarming rate and had led to discontentment and disappointment among the education stakeholders in Nigeria.

Hypothesis five tested for the significant relationship between the methods of teaching science courses and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria. The result showed a significant

relationship existed between the methods adopted in teaching science courses and acquisition of employability skills. This further indicated that the null hypothesis was not accepted.The findings corroborated the study of Stanford (2012) which opined that, peer-peer teaching brings about teamwork among learners which is a behavioural attribute that must be inculcated in the students' day to day learning in classroom.

On the other hand, Schroeder, Scott, Tolson and Huang (2007) found during analysis of their study "Effects of teaching strategies on student achievement in science in United States" the following six categories of teaching strategies to include: i) Questioning (0.74), ii) Manipulation (0.57), Enhanced materials (0.29), Inquiry(0.65), Collaborative learning (0.95), Instructional technology(0.48). The output of the study was able to generate proven facts in connection with the use of other science procedures.

Furthermore, National Research Council (NRC,2013) in the United States of America advocated for shifting from textbook style to hand-on experience and minds-on as well. As a result, different behavioural attributes would be acquired through quality curriculum and prepare graduates for job opportunities as well as maintaining the jobs.The NRC (2013) further suggested other strategies of teaching science to include: Inquiry, Guided Inquiry, Discovery/ problem solving method, open ended laboratory activities, and analysis of result of activity, cooperative learning and field trips. Since science is about investigations, it may also combine thoughtful reflections guided by critical thinking skills (National Academic of Sciences, 1995; Chip, 1997 and Martin, 2000).

Hypothesis six,which statedthat no significant relationship existed between assessment strategies and acquisition of employability skills among potential graduates of universities in the South-West, Nigeria was not accepted based on the findings. The result showedsignificant relationship was found between assessment strategies and employability skills.The findings corroborated Biggs and Tang (2007: pg 23) in their book, quality teaching and learning in higher education" suggested that there was an alliance connecting processes involved in learning, valuing what has been learnt and future results, as inner theme in improving students' knowledge. Other scholars however, suggested that though universities may wish that their students perform better but the practices involved in valuing what has been taught still not give room for such intentions

(Boud and Falchikov, 2005). Bryant and Clegg (2006) were of the opinion that, rather than the value process focusing on improving and accessing judgements, it was based on what an individual knows and the amount of information one is armed with.The quality of curriculum and its valuing process can be improved through giving of comments to learners and show how they will demonstrate the learning as well as selecting the valuing process in connection with the outcome to be achieved (Queens University Learning Centre, 2015).

Hypothesis seven tested for the relative contribution of the independent variables on the dependent variable. The five indicators of quality academic curriculum made individual contribution to the prediction of the perceived employability skills of potential graduates of universities. The findings showedthe relative contributions of instructional materials, physical facilities, human resources and methods of teaching were significant while assessment strategies have negative contribution to employability skills development among potential graduates of universities. Methods of teaching were found to be the most potent variable out of the five variables considered in this study, followed by physical facilities and instructional materials respectively.The findings corroborated the study of Lahina (2017) with the conclusion that, tools adopted in class were vital in giving opportunity for reasoning which inspired learners in visualising what was taught.

On the other hand, Adeogun (2010) found a significant nexus occurring with learners' accomplishments and tools being employed to teach.Author concluded with colleges that have sufficient tools did well more than the others having little or no tools. Adeogun (2010) also found that materials were inadequate in most of the government controlled post primary institutions. Eshiwani (1984) in Likoko et al (2013) acknowledged facilitating better ways of passing information and for learners to understand what is being taught, resources (subject teachers, books) must be provided to make the course interesting.

Ayot &Briggs (1992)pointed to amenities and tools provided for schools being an envisaging element in the outcome of what is being taught. Meanwhile, Ferris (2010) observed great discrepancy in written assessments including laboratory reports and learners' performance at the laboratory. The performance difference indicated practical work being a different competence domain than other assessments. This observation

provided practical appreciation, although nothing more formal of the division of educational outcomes in the areas of reasoning, emotional and useful talents (Krathwohl, Bloom and Masia, 1973; Bloom, Engelhart, Furst, Hill & Krathwohl, 1979).

In addition, Adeboyeje (1984), Adedeji (1998), Owoeye (2000) and Ajayi (2002) and Ekundayo (2010) asserted that, there was a substantial nexus between the pperformance of students and college amenities. Equally, Bakari, Likoko and Ndinyo (2014) explored the presence of impact of amenities on students' excellence in some government controlled institutions and the findings showed learners' accomplishments were better over a period of time with sufficient resources. Blaxell and Moore (2012) on the other hand, asserted that academics must demonstrate all skills and methods to teach students for purposive development of attributes needed to secure a job. They further stressed that one possible way of doing this is through the use of high quality portfolio. It gives opportunities to potential graduates to showcase their skills developed while in school; and the academics and curriculum designers must look into opportunity of providing the students to develop the skills. The findings also corroborated the study of Schroeder, Scott, Tolson and Huang (2007) during the analysis of their study on "effects of teaching strategies on student achievement in science in the United States," the following six categories of teaching strategies to include: i) Questioning (0.74), ii) Manipulation (0.57), Enhanced materials (0.29), Inquiry(0.65), Collaborative learning(0.95), Instructional technology(0.48). The output of the study was able to generate empirical evidence relating to effectiveness of alternative teaching strategies in science. And lastly, other scholars however, suggested that though universities may wish better performance for their students, but the practices involved in assessment of what had been taught still not give room for such intentions (Boud and Falchikov, 2005). Bryant and Clegg (2006) were of the opinion that rather than the assessment focusing on improving and accessing judgements, it was based on what an individual knows and the amount of information one is armed with.

Hypothesis eight sought to find out the significant joint prediction of instructional resources, methods of teaching, assessment strategies on acquisition of employability skills of potential graduates of universities in the South-West, Nigeria. It was found that,a joint prediction existed among instructional materials, physical facilities, and human

resources, methods of teaching, assessment strategies on employability skills of potential graduates.

Hypothesis nine, which stated that, there wass no significant difference in the employability skills acquired by students in public and private universities in the South-West, Nigeria was not accepted based on the finding. It showed that potential graduates acquired employability attributes with discrepancies in both private and public universities. Findings corroborates Abari and Odunayo (2012) in which potential job givers were contented with corrective information of learners but find a substantial discrepancy with different skills acquired from different schools.This might be due to teaching and assessment approaches that were consistent with the curricula intentions.

Similarly, Oyebade and Adedeji (2014) reported that employability status of graduates of higher institutions was very low, owing to poor preparation and very low university–industry linkage. It is very clear that if there is poor curriculum preparation and low university-industry linkage, employability skills acquired by the students will vary from one university to another. It would depend on how prepared each university is in the curriculum design and how the universities were able to make provisions for the outcomes of the university-industry linkage in the curricula.

Evidence has shown that universities were more of theory than practical, science curricula inclusive: which would lead to inadequate provision of useful skills to students and moulding in them professional skills. If a University focused more on practical in science oriented curricula, the probability that the students involved would acquire the skills needed is higher. It is one of the goals of National Policy on Education for higher institutions to produce high level relevant manpower with intellectual skills (FRN, 2013) but the poor and unimpressive educational environment constituted a major constraint to realise this goal.

Private universities provided good and conducive learning environment for their students with fairly adequate facilities to achieve the best coupled with reasonable student-teacher ratio. The skills neededto secure a job will be acquired compared with public universities with incessant strikes due to demands not being met by the government, overcrowding of the classrooms, facilities in the hostels being overused, student- teacher ratio so alarming and among others. In individually owned schools,

attributes were connected with high attainments and maintainance of jobs rather than their counterparts from government controlled institutions (Pitan, 2011). It is imperative to mention here that all these factors can be held responsible for the significant difference in employability skills acquired by students from both individually and government controlled institutions respectively.

Hypothesis ten examined the significance difference between the adequacy of instructional resources in public and private universities in the South-West, Nigeria. The result showed a substantial variance existed ininstructional resources adequacySouth-West universities.The findings corroborated the study of Adeogun (2010) that showed a significant nexus occurring with learners' accomplishments and tools being employed to teach. The author concluded with colleges that have sufficient tools did well more than the others having little or no tools.

Despite the fact that private and public universities do exist, the author, acknowledged inadequacy of instructional resources to be the problem of Nigerian universities. In other words, universities with more instructional materials to teach will produce better graduates armed with practical knowledge particularly in the field of science that requires physical and not abstract evidence. In the same vein, Pitan (2011) pointed out that private universities in Nigeria are trying so hard to justify the values for the charged fees by providing all necessary materials useful to enhance students' performance. Some private universities for instance have some science equipment, hardware that is not in existence in any State or Federal university for students' training.

In contrary, Okoro (2008, 2011) reported acute shortage of facilities and lack of instructional resources in science classroom and science oriented contents. This implied that implementation will be the same for all universities; otherwise, there will not be any significant difference in their implementation process due to being exposed to the same requirements.

Hypothesis eleven stated that, there was no significant difference in the methods of teaching science courses in public and private universities in the South-West, Nigeria. This hypothesis was not accepted based on the results. It showeda variance existed inmethods applied in teaching science courses in private and public universities in South-West, Nigeria.The findings corroborated thestudies of Stannovich (2003), Proctor and

Capaldi (2005) that showed a significant difference existed in teaching methods of public and private universities. This implied that some universities were still using traditional lectures and cookbook laboratory exercises while others based their teaching on science education (Handelma et al, 2004). Due to the technological advancement, there are different ICT tools being used nowadays to enhance learning that goes hand in hand with modernised teaching methods. So if a school has not advanced to such level, a glaring difference will be seen between schools that have advance technology in teaching compared with the ones still embracing the traditional methods as this study had revealed.

In support of advanced method of teaching, Stanford (2012) opined that, traditional system is where teachers used the lecture system for teaching science. The author noted that the drawback of this system was not making learning interactive. The modalities used for learning persuadeda learner to repeatedly go over what was taught and concentrating on writing down what was dictated in the class rather than making science interesting. Babalola (2007) cited in Pitan (2011) noted that lecturers in many public universities placed high premium on promotional activities other than actions that attract rewards while spending limited period to teach, methodology as well as encouraging students.

Pitan (2011) in contrary opined that, private universities in the South-West and Nigeria in general are trying to showcase value for the school fees being charged. As a result, the private universities supervised and monitored daily attendance of their workers. The universities also made sponsorship available for conferences, workshops and seminars for staff development and give rebates to staff members on postgraduate studies. These were being done in order to make the academics current on recent events globally in terms of research, and methodology of teaching that can enhance student learning.These factors aligned together, may be responsible for the differences accounted for in the methods of teaching between public and private universities.

Hypothesis twelve sought to find out the significant differences in assessment strategies used in public and private universities in the South-West, Nigeria. The result showeda varianceexisted in the assessment strategies used in private and public universities in the South-West. According to Queens University Learning Centre (2015), The quality of curriculum and assessment processes can be improved through giving

ofcomments to learners and show how demonstration of the learning and assessment processes wereconnection with achievement of results. The findings corroborated the study of Ferris (2010) in whicha reasonable observation was made concerning learner's performance at the laboratory with the written assessments and laboratory reports. The performance differences indicated practical work was a different competence domain than other assessments. This observation provided practical appreciation, although nothing more formal of the division of educational outcomes in the areas of reasoning, emotional and useful talents (Krathwohl, Bloom and Masia, 1973; Bloom, Engelhart, Furst, Hill and Krathwohl, 1979). Practicum activity required process skills approach, because through skill process, students were able to solve the problems, discovered and developed the fact, concept, and scientific development (Jelita, 2013).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presented the summary, conclusion, and contributions to knowledge, implications of the study, recommendations, limitations and suggestions for future studies.

5.1   Summary

The work examined the relationship between quality of academic curriculum and employability skills among university science graduates in the South-West, Nigeria. Previous works on employability paid little attention to the indicators of quality academic curriculum and the relationship of each of the indicators to employability skills of potential graduates in a specific discipline. This probably might account for the growing cases of graduates' unemployment in Nigeria. Therefore, to be able to address the perennial crisis of unemployment among graduates, the research investigated levels of employability skills acquired by potential graduates; ascertained the types of employability skills required by the employers of labour as well as established the quality of academic curriculum of universities.

Other specific purposes included to examined the adequacy of instructional resources (instructional materials, physical facilities, human resources) in public and private universities; to investigate the relationship between instructional materials and employability skills of potential graduates of universities; to ascertain the connection of physical facilities to skills of potential graduates; examined the correlation of workforce to employability among potential graduates of universities.In addition, the study alsoexplored the nexus betweenteaching methods of science courses and acquisition of employability skills by potential science graduates of universities; established the relationship between assessment strategies and employability skills acquired by potential graduates of universities.Furthermore, the study examined the relative contributions of instructional materials, physical facilities, human resources,methods of teaching, and

assessment strategies to employability skills acquisition of potential graduates of universities and lastly,it investigated the joint relationship among instructional materials, physical facilities, and human resources, methods of teaching, assessment strategies and employability skills of potential graduates of universities in the South-West, Nigeria.

Literature was reviewed in the areas related to the study under the following sub-headings; Conceptual review on employability skills; quality academic curriculum; instructional materials; physical facilities; human resources; methods of teaching and assessment strategies. The empirical review was on instructional materials and employability skills; physical facilities and employability skills; human resources and employability skills; methods of teaching and employability skills; assessment strategies and employability skills.

Responses were sought from lecturers and potential graduates of private and public universities in the South-West of Nigeria. Employers of labour were also contacted as well as officials of National Universities Commission. Sampling procedure of different stages was employed in picking seven universities that consisted of three private and four public universities respectively. Total enumeration, random sampling and purposive sampling techniques were adopted in administering two different sets of questionnaires (QACESQ) to 371 lecturers and 1,330 potential graduates of universities. A total of 284 (84%) lecturers and 1,259 (98%) potential graduates of universities were eventually used for this study. Thirty (30) employers were also randomly sampled in South-West, Nigeria. Only 4 officials of the NUC were interviewed from both Academic Standard and Curriculum sections recommended from the secetary's office of the NUC. In addition, other stakeholders or keyplayers in curriculum planning and development such as students, lecturers and employers of labour were also interviewed.

Results showed that the students identified leadership skills among other skills as the most acquired skill with a mean of 3.36 followed by self-confidence skill (3.23) and that with a weighted mean of 3.13 respondents indicated highly acquired employability skills. Employers of labour, on the other hand, saw teamwork as the most required skill for entrance into the labour market having an average value to be 3.62, interpersonal skills (mean= 3.50). The curriculum used in the universities was fairly current while inquiry method wasbroadly used. It was also found that there were inadequacies in the

instructional materials used in the universities while the physical facilities and human resources were fairly adequate considering the weighted mean of 2.55.

Results also indicated that, significant relationship existed between instructional materials and employability skills; the relationship between physical facilities and employability skills was significant; a significant relationship existed between human resources and employability skills; employability skills acquired by potential graduates of universities have joint significant relationship with instructional materials, physical facilities and human resources. Further results included, a significant relationship between the methods adopted in teaching science courses and acquisition of employability skills; significant relationship was found between assessment strategies and employability skills.Also, the relative contributions of instructional materials, physical facilities, human resources and methods of teaching were significant while assessment strategies had negative contributions to employability skills development among potential graduates of universities.Methods of teaching were found to be the most potent variable out of the five variables considered in this study followed by physical facilities and instructional materials respectively. Likewise, a joint significant prediction existed with instructional materials, physical facilities, and human resources, methods of teaching, assessment strategies and employability skills of potential graduates. However, it was found that students acquired employability attributes with discrepancy for both private and public universities; a substantial variance existed with instructional resources adequacy in the South-West universities; a variance inmethods applied in teaching science courses in private and public universities in South-West and lastly, the variance in the assessment strategies used in private and public universities in the South-West, Nigeria.

5.2   Conclusion

That a relationship existed between quality of academic curriculum and employability skills among potential graduates of universities is a proven fact. In this study, empirical evidence had been provided to show that employers of labour considered employability skills as highly required for graduates coming into the labour market and that, in science curriculum, the employability skills are embedded in the curriculum but inadequacy of

instructional materials to implement the curriculum had been recognised as the major barrier to the students not being able to acquire the needed skills to function optimally in their places of employment. These instructional materials include non-projected display materials; still projected display materials; technological instructional media as well as some physical facilities.

It is evident from this study that the curricula content of universities have no problem in bringing out the best skills from the students but the means of conveying the contents, which indicated that, the problemof inadequacies in instructional resources must be properly addressed in South-West,universities. The recommendations provided in this study will serve as a means of rectifying identified problems confronting how curriculum content are executed in scienceoriented disciplines to acquire the skills needed by employers of labour.

5.3 Recommendations

The recommendations provided in this study will serve as a means of rectifying identifiedproblems confronting how curriculum content is executed in science oriented disciplines to teach the skills needed in labour market.

In accordance with the findings of this work, some recommendations were presented:

1) Necessity calls for the promotion of curriculum implementation as a means of enhancing graduate employability attributes like writing skills, analytical and decision making skills.

2) Employers of labour in South-West, Nigeria should strengthen their efforts at promoting graduate employability skills such as information technology skills and presentation skills by organising periodic training, seminars, career talk and job fairs for students as well as their lecturers. This can be executed through collaborative efforts of the universities with the education stakeholders in supporting skills development programs.

3) Universities should ensure that their academic curricula are coherent, relevant, rigorous, flexible and current to respond effectively as desired by employers.

4) There should be provision of instructional materials such as non-display materials, still projected materials and technological institutional media as a way of enhancing acquisition of employability skills by students.

5) An alignment must be facilitated withplanned curriculum content,manpower and assessment of students' work as a means for improving learning.

6) Bloom's taxonomy verbs must be encouraged in promoting employability skills of the students. These verbs facilitate whether a student had acquired a skills or not. They include understanding, awareness, exploration,presentation, appraisaland creation.

7) Teaching procedures adopted by lecturers must be improved upon to be in line with international best practices. This will facilitate the quality of what is given to students. Problem solving method and field trips can enhance hands-on-experience of students.

8) An enabling environment that will facilitateprocesses of good quality ought to be encouraged. Since there were differences in physical facilities of universities, paying more attention to this area of need will contribute immensely to quality.

9) Assessment strategies of universities should be reviewed and lecturers ought to be motivated in usingthe approaches that will expose the students to practical skills, for example research report and presentation.

5.4 Implications of the Study

The output of this research contains implications for both students and employers alike.**Practice:**The deductions made from the study indicated that quality academic curriculum variables were significant constructs that influenced and explained acquisition of employability skills. This study has implication on leadership skill which showed that the potential graduates were worked through various leadership programs since this skill is the most acquired by the students. Another implication of the study is on social returns on the investment on education. This will be less than expected if graduates are not gainfully employed after school. On the other hand, the employers of labour will experience low productivity on the side of those that are eventually employed with more or less no skill.

Policy: The study's outcome is an indication for policy makers and administrators on the need to ensure a robust relationship between curricula contents and acquisition of employability skills. This will facilitate new ways of perceiving or enhancing the educational process vis-à-vis the perceptions or expectations of the society. The findings on adequacy of instructional materials would promote better and laudable policies in the delivery of academic curriculum.

5.5 Contributions to Knowledge

The study made the following contributions to knowledge:

i.   Established that teamwork is a parameter for measuring employability status of university graduates.

ii.   Inquiry method was established to be the most potent method that can bring acquisition of employability skills among university graduates.

iii. Extended the input-output model to explain the variables of course content, workload, teaching duration, learning objectives and the development of employability skills among university science graduates in South-West, Nigeria.

iv.   Provided empirical evidence to support the relationship between quality of academic curriculum and employability skills development among university science graduates, thereby deepening the ongoing discussion on the predictors of graduate employability in developing economies like Nigeria.

v.   Adopted the quality enhancement model and the input-output conceptual framework to explain the interrelationship between quality of academic curriculum variables and employability skills development among university science graduates in South-West, Nigeria.

5.6 Limitations of the Study

(i)   The contents of the curricula were not covered in this study. This is due to the fact that contents are being controlled by the National Universities Commission, which regulates affairs in university system in Nigeria.

(ii) This study was limited by geographical scaling, having been conducted in a geo-political zone and focused on only four public and three private universities in the South-West, Nigeria. Therefore, there is room for making the scope wider and its findings more reliable and generalised if more universities are investigated.

(iii) In the analysis of results, in other to have a robust analysis, the software called Nvivo for the analysis of the contents of the interview was not available. So, the interview recorded was transcribed manually and the content analysis was also done manually.

(iv) Generalisation of the findings to Arts and Humanities based disciplines should be applied with cautions. This can be attributed to thepeculiar nature of acquiring skills in sciences thatare not similar to Arts and Humanities.

5.7   Suggestions for Further Studies

The study examined the quality of academic curriculum amd employability skills of University science graduates in the South-West, Nigeria. However, the researcher will not claim to have exhaustively covered the areas needed to be treated by these constructs. To fill the vacuum inadvertently created in this study, the researcher suggested the followings for further studies:

i.   More advanced models such as Congruence model should be employed to examine the quality of instructional materials and students' academic achievements in the South-West of Nigeria.

ii. A comparative study of quality of academic curriculum and employability skills could be considered among University science graduates in only the public or private universities.

iii. There should be an investigation into the geographical variation of quality of academic curriculum and employability skills among university science graduates in other geo-political zones of Nigeria.

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APPENDICES

UNIVERSITY OF IBADAN   FACULTY OF EDUCATION
APPENDIX 1

DEPARTMENT OF EDUCATIONAL MANAGEMENT

Quality of Academic Curriculum and Employability Skills Questionnaire
(QACESQ)
(To be completed by Academic/Teaching Staff)

Dear Sir/Ma

The questionnaire is meant to elicit information on Quality Academic Curriculum and Employability Skills of University Science graduates in South-West, Nigeria. The information will be used solely for academic purpose. You are kindly implored to fill the questionnaire with sincerity.

Thank you.

Olukemi Omolola Ogunniran.

Section A: Demographic Data.

1.   University: Public (   )   Private   (   )

2.   Department   Academic   (   )   Service   (   )

3.   Status/Rank/ Designation: Dean ( )   HOD (   ) Academic Planning Director ( )

       Lecturers (   )

4.   Gender :   Male   (   )   Female   (   )

Section B: Quality

INSTRUCTION: Kindly use the 4-point scale below to rate the statement by ticking the information key: SA- Strongly Agree with statement (4), A-Agree with statement (3), SD-Strongly Disagree with statement (2) D-Disagree with statement (1)

Items	In my University, Quality in Academic curriculum include:	SA(4)	A(3)	SD(2)	D(1)
1.	**Coherency:** Beliefs and values visibly integrated into the course as well as linkages among course description, learning outcomes, teaching and learning strategies and assessments clearly articulated.				
2.	**Relevancy:** There is proven fact of stakeholders' involvement, learning outcomes provide clear portrait of the knowledge and abilities of students				
3.	**Rigour:** The course content is comprehensive				
4.	**Flexibility:** Individual learning needs were recognized				
5.	**Currency:** There is evidence of use of current knowledge; current industries, field professionals are met appropriately likewise teaching/learning methods are current and appropriate.				

SECTION C: Instructional Resources

Kindly use the 4-point scale to rate the adequacy of instructional materials, physical facilities and human resources for curriculum implementation in your university using the information key: Very Adequate-4, Adequate-3, Fairly Adequate-2, Not Adequate-1

Items 1	Adequacy of Instructional Materials	VA(4)	A(3)	FA(2)	NA(1)
i.	Printed and Duplicated Materials				
ii.	Non- projected Display Materials				
iii.	Still projected display Materials				
iv.	Technological Instructional Media				
v.	Computed- mediated Materials				
II	**Physical Facilities:** i) Spaces: Offices, Classrooms/ Lecture Theatres ii) Resource room iii) Laboratories iv) Workshops/Studios v) Library and Information				

III	**Human Resources:**
	
	i) Academic Staff
	    • Number with respect to enrolment
	    • Rank mix
	    • Qualification with proportion to Ph.D
	ii) Non-Academic Staff
	    • Technical Staff
	    • Administrative Staff				

SECTION D: Assessment Strategies

Contribution of assessment strategies in producing employable graduates

Items	Assessment Strategies	Very Large Extent(4)	Large Extent(3)	To Some Extent (2)	A little Extent(1)
1.	Formative Assessment: i. Observation ii. Questioning/Interviews iii. Discussion iv. Graphic Organizers v. Peer/Self- Assessment vi. Practical/ Student Demonstrations vii. Visual Representation viii. Laboratory Reports ix. Research Report and Presentation				
2.	Summative Assessment: i) Attendance and Participation ii) Quizzes iii) Tests iv) Assignments v) Mid-semester examination vi) Final Semester examination vii) Final Projects				

SECTION E: Methods of Teaching

Kindly use the 5-point scale to rate the methods of teaching science courses by ticking the information key: Excellent-5, Very Good-4, Good-3, Fair- 2, Poor-1.

Items	Methods of Teaching	E(5)	VG(4)	G(3)	F(2)	P(1)
1.	Inquiry Method – the 5 E's					
2.	Oral Presentation					
3.	Active Learning					
4.	Hands on Activities/ Think pair					
5.	Share /Group work					
6.	Excursions for developing science understanding					
7.	Case studies/mini-conference/plays					
8.	Concept Maps					
9.	Conducting Experiments /Demonstrations/ Laboratory method					
10.	Field Trips					
11.	Lecture cum Discussion method					
12.	Analysis of results of activity					
13.	Explanation on why certain events occurred					
14.	Peer-peer teaching					
15.	Current Events Tie-ins					
16.	Observation Method					
17.	Project Method					
18.	Problem solving method					
19.	Open ended laboratory activities					

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APPENDIX 11

DEPARTMENT OF EDUCATIONAL MANAGEMENT

Quality of Academic Curriculum and Employability Skills Questionnaire (QACESQ)

(To be completed by potential science graduates of College/Faculty of Science)

Dear Student,

The questionnaire is meant to get information on Quality Academic Curriculum and Employability Skills of University Science Graduates in the South-West, Nigeria. The information will be used solely for academic purpose. You are kindly implored to fill the questionnaire with sincerity.

Thank you.

Olukemi Omolola Ogunniran.

Section A: Demographic Data

University: Public (   )   Private   (   )

Department: --

Gender: Male: (   )   Female (   )

Age: 16-20 years (   )   21-25years (   ) 26-30 years (   ) 30 years and above (   )

Section B: Employability Skills acquired by Students

Kindly use the 4-point scale to rate the acquisition of employability skills by students through the science curriculum by ticking the information key: Highly Acquired-4, Acquired-3, Somehow Acquired-2, Not Acquired-1

Items	Employability Skills Acquired	HA(4)	A(3)	SA(2)	NA(1)
1	Leadership Skills				
2.	Interpersonal Skills				
3.	Problem Solving				
4.	Presentation Skills				
5.	Communication Skills (Oral)				
6.	Analytical Skills				
7.	Information Technology Skills				
8.	Decision Making Skills				
9.	Critical Thinking Skills				
10.	Creativity				
11.	Teamwork				
12.	Adaptability				
13.	Self-Confidence				
14.	Independence				
15.	Initiative				

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APPENDIX 111

DEPARTMENT OF EDUCATIONAL MANAGEMENT

Quality of Academic Curriculum and Employability Skills Questionnaire (QACESQ)

(To be completed by employers and bosses of university graduates in the selected organisations).

Dear Sir/Ma

The questionnaire is meant to get information on Quality Academic Curriculum and Employability Skills of University science graduates in the South-West, Nigeria. The information will be used solely for academic purpose. You are kindly implored to fill the questionnaire with sincerity.

Thank you.

Olukemi Omolola Ogunniran.

Kindly tick the options that correspond with your opinions where necessary

Section A: Background Information

1) Name of Organisation --

2) Type of Industry:

i) Manufacturing/ Construction   (   )

ii) Agriculture/ Forestry   (   )

iii) Health Industry   (   )

iv) Banking   (   )

v) Education   (   )

3) State Located: --------------------------------------

Section B: Employability Skills required by Employers of Labour

Tick as appropriate how required are the under listed employability skills byemployers of labour using the 4-point scale of Highly Required-4, Required-3, Less Required-2, Not Required-1

Items	Employability Skills	Highly Required (4)	Required (3)	Less Required (2)	Not Required (1)
1	Leadership				
2.	Interpersonal				
3.	Problem Solving				
4.	Presentation				
5.	Communication (Oral)				
6.	Analytical				
7.	Information Technology				
8.	Decision Making				
9.	Critical Thinking				
10.	Creativity				
11.	Teamwork				
12.	Adaptability				
13.	Self-Confidence				
14.	Independence				
15.	Initiative				

Others: (Please specify) ---

APPENDIX 1V

Key Informants Interview Guide for National Universities Commission Officials

i.   What is 'quality' in academic curriculum and how does NUC maintain quality in the universities?

ii.   In your opinion, what are the skills that should be embedded in the goals of science curriculum for students?

iii.   How adequate should be the instructional resources needed to implement curriculum goals? Give reasons for your answer.

iv.   What are the assessment strategies that you envisage might bring about acquisition of employability skills by students and why?

v.   How important are the employability skills required by the employers of labour? Give reasons for your answer.

vi.   How do you ensure that employability attributes are entrenched inside the curriculum for potential university graduates?

For Employers of Labour

i.   What are the employability skills required by employers of labour from new graduates coming into the labour market?

ii.   How important are these skills?

For potential science graduates

i.   What are the employability skills that you think you must have acquired while in school?

APPENDIX V

LIST OF EMPLOYERS OF GRADUATES OF SCIENCE IN SOUTH-WEST NIGERIA

1) Addax Petroleum Development Company, Lagos State, Nigeria.

2) Adeleke University, Ede, Osun State.

3) Dots Systems and Services Ltd, Abeokuta, Ogun State.

4) Federal Medical Centre, Abeokuta Ogun State.

5) Mcube Global Connect Ltd, Lagos.

6) Dangote Group of Company, Victoria Island Lagos.

7) Livestock Feeds Limited, Lagos.

8) Seplat Petroleum Development Company Plc, Lagos.

9) T.M.A. Solicitors Legal Practitioners and Co. Akure, Ondo State.

10) Rehoboth Law Firm, Akure Ondo State.

11) Ministry of Justice, Ado- Ekiti, Ekiti State.

12) Albarka Agro Allied and Chemical Nig. Ltd. Victoria Island , Lagos

13) Coop Property Development Co. Ltd, Bodija, Ibadan, Oyo State.

14) Coop Savings and Loans Ltd, Ibadan, Oyo State.

15) Nigeria Bottling Company, Asejire Plant, Oyo State.

16) Tons Property Development Ltd, Cocoa House, Ibadan, Oyo State.

17) Sumal Foods Ltd, Ring Road, Ibadan, Oyo State.

18) Globacom Limited, Ibadan, Oyo State.

19) Unity Bank PLC. Osogbo, Osun State.

20) Leadway Assurance Co. Ltd Osogbo, Osun State.

21) First Bank of Nigeria Insurance, Osogbo, Osun State.

22) Union Diagnostic and Clinical Services, Osogbo, Osun State.

23) Sonap Ventures Nig. Ltd, Osogbo, Osun State.

24) Biket Medical Centre Osogbo, Osun State.

25) Rave FM, Osogbo, Osun State.

26) MTN Nigeria, Ibadan, Oyo State.

APPENDIX VI

LIST OF UNIVERSITIES, NUMBER OF LECTURERS AND POTENTIAL SCIENCE GRADUATES OF FACULTIES OF SCIENCE IN THE SOUTH-WEST, NIGERIA (2017/2018, Academic Session)

S/N	Private Universities	Potential Science Graduates	Number of Science Lecturers
1	Adeleke University, Ede, Osun State	100	18
2	Afe Babalola University, Ado-Ekiti, Ekiti State	*RESTRICTED INFORMATION	Not Available
3	Ajayi Crowther University, Oyo	85	30
4	Babcock University, Illishan-Remo, Ogun State	258	58
5	Bells University of Technology, Ota Ogun State	*RESTRICTED INFORMATION	Not Available
6	Bowen University, Iwo, Osun State	251	77
7	Caleb University, Imota, Lagos State	100	29
8	Covenant University, Ota, Ogun State	383	179
9	Crawford University, Igbesa, Ogun State	82	26
10	Cresent University, Abeokuta, Ogun State	101	37
11	Elizade University, Ilara-Mokin, Ondo State	34	15
12	Fountain University, Osogbo Osun State	75	32
13	Joseph Ayo Babalola University, Ikeji-Arakeji, Osun State	95	37
14	Lead City University, Ibadan, Oyo State	142	38
15	McPherson University, Seriki- Sotayo Ajebo, Ogun State	40	15
16	Oduduwa University, Ipetumodun, Osun State	80	27
17	Pan Atlantic University, Lagos	Undergraduate courses not yet introduced.	Till 2020
18	Redeemer's University, Akoda-Ede, Osun State	65	28
19	Saint Augustine University, Ilara-Epe,Lagos State	15	18
20	South western University, Okun-Owa, Ogun State	13	16

21	The Achievers University Owo, Ondo State	55	23
22	Wesley University, Ondo State	50	23
	Names of State universities		
1	Adekunle Ajasin University, Akungba-Akoko, Ondo State	296	50
2	Ekiti State University, Ado- Ekiti, Ekiti State	292	98
3	Ladoke Akintola University of Technology, Ogbomoso, Oyo State	355	64
4	Lagos State University, Ojoo	721	Not Available
5	Olabisi Onabanjo University, Ago-Iwoye, Ogun State	97	32
6	Ondo State University of Science and Technology, Okitipupa, Ondo State	319	76
7	Osun State University, Osogbo, Osun State	195	40
8	Tai Solarin of University of Education, Ijebu-Ode, Ogun State	315	52
	Names of Federal universities		
1	Federal University of Agriculture, Abeokuta, Ogun State	779	175
2	Federal University of Technology, Akure, Ondo State	639	73
3	Federal University Oye-Ekiti, Ekiti State	442	134
4	Obafemi Awolowo University, Ile-Ife, Osun State	660	170
5	University of Ibadan, Ibadan, Oyo State	596	226
6	University of Lagos, Akoka, Lagos	1300	226
	Grand Total	**9,030**	**2,142**

Source: Dean's Offices of Faculties of Science in each University (2017).