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CHAPTER ONE
INTRODUCTION

Background of the Study

Students Industrial Work Experience Scheme (SIWES) is a programme that was designed to equip students with work skills, methods and processes of an industry (ITF, 2003). Osinem and Nwoji (2010) stated that Students Industrial Work Experience Scheme is a skill training programme designed to expose and prepare students of higher institutions for work situations, as they exist in the world of work. The authors noted that the scheme provides students with opportunities to familiarize themselves with and expose them to tools, equipment and machines that are not available in their various institutions but which will be used after graduation. The scheme exposes the students to work methods and prepares them for safeguarding the work area and other workers in the industry.

Hence, the objectives of Students Industrial Work Experience Scheme (SIWES) in relation to Agricultural Education include: to produce an avenue for Agricultural Education students to acquire agricultural experiences and skills required for success in agricultural occupations; to prepare agricultural education students for working in agricultural enterprises after graduation; to expose Agricultural Education students in handling agricultural tools,
equipment and machines that are necessary for carrying out agricultural productions; to help Agricultural Education students for easier transition from school to agricultural occupation; and to afford Agricultural Education students the opportunity of applying the knowledge gained in theoretical work into practical work in agricultural industry (Industrial Training Fund, 2003).

The Industrial Training Fund (ITF) is a manpower training and development agency charged with the responsibility of providing the needed skills, knowledge and attitude for improved efficiency and increased productivity in industry and commerce (ITF Handbook). This is why the mission statement of the Industrial Training Fund was to set and regulate training standards and offer direct training intervention in industrial and commercial skills training and development using a corps of highly competent professional staff, modern techniques and technology (www.unirazak.edu).

Consequently, the provisions of the enabbling Act, (Decree 47 of 1971) the ITF has the responsibility of promoting and encouraging the acquisition of skills in industry and commerce with a view of generating a pool of indigenous manpower to meet the needs of the Nigerian economy. Ultimately, the fund sets and regulates training standards and provides direct
training and training services to its clients. Osinem and Nwoji (2010) highlighted some of the roles played by the ITF towards the management of SIWES in Nigeria, which include: the formulation of policies and guidelines on SIWES, organisation of regular orientation programmes for participating students before engaging on attachment among others.

However, the ITF cannot singly carry the whole responsibilities involved in SIWES management without the involvement of some regulatory agencies like the National Universities Commission (NUC), the National Board for Technical Education (NBTE) and the National Commission for Colleges of Education (NCCE). This ensures the decentralization of SIWES management and collaborative effort toward formidable industrial training programme.

The National Commission for Colleges of Education (NCCE) is the highest body that is responsible for the administration and management of Colleges of Education in Nigeria. The NCCE was established by Decree (now Act) 13 of 17th January, 1989 (Amended Act of 1993) as a completion of tripod of excellence in the supervision of higher education in the country (www.ncceonline.org). The enabling decree (now Act) mandated the Commission to perform certain functions which include: to ensure that functional SIWES coordinating units are established in participating
institutions, to encourage the appointment of full time industrial coordinators to operate the scheme in the institution, to vet and approve master and placement lists and forward them to the ITF, to monitor and review courses eligible for SIWES in Colleges of Education, among others.

The College of Education is a post secondary education that is charged with the responsibility of producing the Nigeria Certificate in Education (NCE) teachers. College of Education is a tertiary institution that prepares teachers for a minimum of three years to make them qualify to teach their respective subjects including agriculture in basic (primary or junior secondary) schools. In Colleges of Education, students studying vocational courses undergo four months SIWES training at the end of their second year. Those vocational courses according to the Federal Republic of Nigeria (2002) include: Agricultural Education, Business Education, Home Economics Education, Technical Education, Computer Education, and Creative Arts and Design.

Agricultural Education in the view of Egbule (2002) is the type of education that is employed in training learners in the improved agricultural production processes, as well as in the techniques for the teaching of agriculture. Agricultural education also refers to the teaching of skills, values, attitudes and related knowledge in production, processing and
marketing of agricultural and related products. The philosophy of the NCE (Agricultural Education) programme is tied to the national philosophy of agriculture for self-reliance based on the provision of teachers endowed with a balanced approach between principles and practice of agriculture for academic and vocational ends (Federal Republic of Nigeria (FRN), 2002). In line with the above philosophy, the NCE Agricultural Education students are mandated to undergo compulsory four months SIWES training to bridge the gap between theory acquired in classroom and practicals as they exist in the world of work. SIWES helps to expose the NCE Agricultural Education Students to work methods, tools and equipment which they would eventually use after graduation. This will help them to be self-reliant, competent and skillful in the area of agricultural occupations. The NCE Agricultural Education graduates are prepared to teach in basic (primary or junior secondary) schools.

Secondary schools are the intermediary institutions between primary schools and tertiary institutions. In the present 9-3-4 system of education in Nigeria, the last three years of nine year basic education is for upper basic (Junior Secondary) while the three years is for Senior Secondary(FRN,2004). The NCE Agricultural Education graduate who is employed to teach in upper basic (Junior Secondary) school is assigned to
the more experienced Agricultural Science teacher known as the Head of Agricultural Science Department for supervision. According to Okeke (2003) the Head of Agricultural Science Department has the responsibilities of supervising the notes of lesson, attendance to classes, teaching techniques of all the subject teachers under him. The more experienced agricultural science teacher who is the head of agricultural science department should teach in senior secondary section since both the upper basic (Junior Secondary) and Senior Secondary make up the secondary school. The head should therefore possess Bachelor degree in Agricultural Education.

The NCE Agricultural Education graduates can also be employed in Agricultural industries. These are the industries that engage in the production, processing, preservation and marketing of agricultural products (Egbule, 2002). The author stated that some of the industries Agricultural Education graduates could be employed may engage in animal production, crop production, soils and surveying, agricultural marketing, farm business management, agricultural mechanization, forestry, fishery, food technology, wildlife conservation, among others. The newly employed will be attached to a senior and more experienced staff of the industry for supervision and control. In the light of all the organizations and agencies that engage in the running of SIWES to make it a success, it is therefore necessary to appraise
the programme to ascertain the extent it has improved the agricultural skill acquisition of students.

According to Oladosu in Kupoluyi (2006) appraisal is the passing of judgment of worth or quality or condition of something. Appraisal is the judgment of the value, performance or nature of something. It is the estimation or judgment of the quality, amount, size and other features of something. Therefore, appraisal in the context of this study is the judgment of the extent to which Students Industrial Work Experience Scheme in Agricultural Education in Colleges of Education have achieved their objectives for which they were established. Appraisal of the scheme is necessary to find out the extent to which the objectives of SIWES in Agricultural Education have been achieved which would be manifested in the performance of the graduates of the programme.

**Statement of the Problem**

Over the years, the managers of agricultural industries were not satisfied with the work performance of Agricultural Education graduates employed in Agricultural Industries. This was supported by Osinem and Nwoji (2010) who noted that there was a growing concern among Industrialists that graduates of higher education lacked adequate practical background needed for employment in Industries. Maclean and Lai (2011)
reported that Technical and Vocational Education and Training (TVET) curricular have lost their relevance to the requirements of the labour market in many nations. The authors noted that employers prefer to employ untrained youths or academic graduates and provide on-the-job training which will enable them acquire the necessary competencies and skills required in industries.

It is against this background that the study is conceived to ascertain the extent to which Students Industrial Work Experience Scheme has impacted on the NCE Agricultural Education graduates who have passed through the programme and have secured employment in agricultural industries and the related fields. It is assumed that any Agricultural Education graduate who passed through SIWES should acquire the necessary competencies and skills that will enable him secure and remain in the Agricultural Industry. The extent to which SIWES objectives have been achieved is the concern of this study.

**Purpose of the Study**

The purpose of this study was to appraise Students Industrial Work Experience Scheme on graduates’ performance in Agricultural Education in Colleges of Education in Enugu State, Nigeria. The specific objectives were to ascertain the extent to which:
1. Students Industrial Work Experience Scheme (SIWES) has enabled Agricultural Education graduates of Colleges of Education to acquire agricultural experiences and skills required for success in crop production;

2. SIWES has equipped Agricultural Education students for working in livestock enterprises after graduation;

3. SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production;

4. SIWES has enhanced easier transition of Agricultural Education graduates from school to agricultural processing enterprises; and

5. SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

Significance of the Study

The findings of this study would be beneficial to the following: the ITF, Colleges of Education, Agricultural Industry, Government and students. Findings of the study on graduates skill acquisition in crop production will be of benefit to the ITF. It would help the ITF make rational decision on the allocation of resources for better management of SIWES. The findings of the
study on students working in livestock enterprise after graduation will be of great importance to livestock entrepreneurs. It would help to boost the morale of livestock entrepreneurs to put more efforts in the training of Agricultural Education students in their enterprise.

The finding of the study on graduates handling of agricultural equipment and machines would be beneficial to Agricultural Industries, Colleges of Education and the ITF. Since students cannot acquire adequate skills without equipment and machines to practice, the finding would help the Agricultural Industries to procure the necessary equipment and machines that would help students derive the maximum benefit from the SIWES. The finding would also help the Colleges of Education during students placement in deciding which Agricultural Industries to place students for SIWES. From the finding of the study, the ITF would know that not all Agricultural Industries perform well. This would compel the ITF to identify those Agricultural Industries that are not performing well and blacklist them from engaging in SIWES.

The finding of the study on transition of graduates from school to agricultural processing enterprises would be beneficial to Agricultural Education students. Agricultural Education students would be motivated by the performance of the Agricultural Education graduates in the area of
agricultural product processing skills possessed. This will make them to be serious while on SIWES. The finding of the study on the application of knowledge gained in theoretical work into practical work in forestry industry would be of benefit to the Governments. The finding would help the Governments to expand the forestry industry in Nigeria for climate change adaptation and timber production since the graduates acquired the skills in forestry.

**Research Questions**

The following research questions were formulated to guide the study:

1. To what extent has Students Industrial Work Experience Scheme (SIWES) enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production? ;

2. To what extent has SIWES equipped Agricultural Education students for working in livestock enterprises after graduation? ;

3. To what extent has SIWES helped Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural productions? ;
4. To what extent has SIWES enhanced the transition of Agricultural Education graduates from school to agricultural processing enterprises?; and,

5. To what extent has SIWES afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry?.

**Hypotheses**

The following hypotheses were formulated and tested at 0.05 level of significance (p).

**H01:** There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production;

**H02:** There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has equipped Agricultural Education students for working in livestock enterprises after graduation;

**H03:** There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural
Industries on the extent SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production;

H04: There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has enhanced the transition of Agricultural Education graduates from school to agricultural processing enterprises; and,

H05: There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

**Scope of the Study**

This study was restricted to the appraisal of students Industrial Work Experience Scheme on graduates’ performance in Agricultural Education in Colleges of Education in Enugu State, Nigeria. The study was limited to finding the level of agricultural skill acquisition of graduates within the confines of crop production, livestock production, agricultural machines and equipment, agricultural products processing and forestry. The work did not
include agricultural skill acquisition of graduates in the field of soil science, fishery, agricultural economics and marketing. The study was not assessing SIWES processes like supervision, placement, allowances, duration, etc rather it focussed on appraising the objectives of the programme.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the review of related literature. The review was organized under the following sub-headings:

Conceptual Framework

The concept of SIWES:

a. SIWES and Skills Acquisition in crop production.

b. SIWES in preparation for working in Livestock Enterprises.

c. SIWES and Techniques in Handling Agricultural Equipment and Machines in Agricultural Occupations.

d. SIWES and Transition from school to Agricultural processing enterprise.

e. SIWES and application of knowledge gained in theoretical work into practical work.

Theoretical Framework

a. Theory of Skill Acquisition

b. Experiential Learning Theory

c. Theory of Work Adjustment

d. Two-factor Theory of Job Satisfaction

e. Theory of Multiple Intelligences
Models of Evaluation

a. The CIPP Evaluation Modem
b. The Formative Evaluation Model
c. The Countenance Evaluation Model
d. The Summative Evaluation Model

Related Empirical Studies

Summary of Related Literature.

Conceptual Framework of the Study

The Concept of SIWES

Students Industrial Work Experience Scheme (SIWES) is a human resource development agency that expose students of higher institutions to work methods of the industry(ITF, 2003). According to the author, SIWES was designed to enable students of higher institutions to acquire practical skills and knowledge to enable them fit adequately into the world of work. Osinem and Nwoji (2010) reported that the central focus of the scheme was to enlist and strengthen employers involvement in the educational process of preparing students for work. The aim of the scheme is to promote the much desired technological know-how for the advancement of the nation in
addition to developing skilled and articulated human resource needed for a self reliant economy.

In realization of the Industrial Training Fund Policy guideline, the ITF within the few years of operation in industry, identified the lack of practical skills among locally trained engineers and technologists(ITT,2003). The Fund observed a serious gap between theory and practice in practically oriented courses in almost all Nigerian institutions of higher learning. It was in an effort to bridge the identified gap between theory and practice in engineering and technology in the tertiary institutions that the ITF initiated the Students Industrial Work Experience Scheme(SIWES) in 1973(ibid).

According to Mafe(2010) participation in the scheme today include Science, Engineering, Technology, Education, Environmental Studies and Agriculture programmes in Universities and Polytechnics as against only Engineering and Technology when it was established while in Colleges of Education, SIWES covers NCE programmes in Technical Education, Agricultural Education, Business Education, Creative Arts & Design Education, Computer Education and Home Economics Education.

On the duration of SIWES, the ITF(2003) reported that the University students reading relevant courses have six months industrial attachment at the end of their third year, fourth year and fifth year, depending on the
programme. The Polytechnic and College of Technology students on National Diploma programme in relevant courses have four months industrial attachment at the end of their first year while the Colleges of Education students have four months of industrial attachment at the end of their second year. Students in the preliminary classes as well as postgraduate students are not eligible (ibid).

*SIWES and Skills Acquisition for Success in Crop Production*

Agricultural skills are the capabilities a specialist in the field of agriculture must possess in order to work as a professional in the area (Osinem, 2008). Students Industrial Work Experience Scheme (SIWES) according to Mafe (2010) is a planned and supervised training intervention based on stated and specific learning and career objectives, and geared towards developing the occupational competencies of the participants including crop production competencies. The author maintained that the programme required to be undertaken by all students of tertiary institutions in Nigeria pursuing courses in engineering, agriculture and other fields. Ugwuanyi (2010) noted that SIWES is the key factor in enhancing the efficiency and expertise of the workforce. According to the author, it prepares Agricultural Education students for labour market and crop
production occupations. It has become an innovative phenomenon in human resources development and occupational training in Nigeria.

Osinem and Nwoji (2010) reported that SIWES has reached wide dimensions in recent times and all industrial and commercial establishments contribute to make it operational by providing specific skills in form of experience in different occupations including crop production occupation. There is hardly any sizeable industrial and commercial establishment in different works of life that is not involved in the scheme. The authors noted that the rapid growth in the number of students and institutions was an indication of the acceptability of the scheme by institutions, employers and students for occupational experience growth of the participants including Agricultural Education students in Colleges of Education.

On the impact of SIWES in technical skill development jointly studied by the Industrial Training Fund and the University of Jos (2011), it was reported that all the three employers in the study positively indicated that the period of exposure of Agricultural Education students to agricultural industry did influence the acquisition of technical skills in crop production and other occupations. Similarly, the result showed that over half of the students strongly agreed that the period of exposure to agricultural industry influenced their acquisition of technical skills in crop production. This was
an indication of the importance of the scheme to the acquisition of skills in crop production and other occupations for the development of the country. According to the report, the study showed that some students were employed due to their outstanding performances. The absorption of former SIWES students by agricultural industries was quite high as over half of the industries had employed four or more of their former SIWES students. These students cannot be retained by the agricultural industries if there was no improvement in experiences and skills needed to perform significant tasks in crop production.

Olabiyi (2004) asserted that the SIWES as an arm of Industrial Training Fund has emerged as a stimulating factor in making education real and meaningful to the students as students acquire specific skills relevant to their occupations. Olabiyi noted that things were fast changing particularly as it was becoming a thing of past when white-collar jobs were viewed with not only reverence but as most rewarding type of work for a young man. According to the author, a programme like Student Industrial Work Experience Scheme was viewed as having many advantages in preparing people for self-employment in their chosen occupation including crop production occupation, which ultimately would lead to a rapid development of the country.
Therefore, SIWES helps Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills in production of various crops. These skills will help the graduates secure employment in crop production industries or the skills could be utilized by the Agricultural Education graduates to establish and manage crop farms.

*SIWES in Preparation for Working in Livestock Enterprises*

In his approaches to improve the agricultural manpower production in Vocational Technical Education, Ekunke (2008) asserted that there is need to forge closer links and cooperation among livestock industries, training institutions and Governments than it exists presently. Okorie (2000) maintained that employees of technical manpower, if they have a stake in the quality of manpower produced, should display greater commitment through job training and financial contribution to promote the quality of training in agricultural institutions.

Okorie noted further that such employers having contributed materially, would be more forthcoming in exposing trainees on industrial attachment to worth-while work experience and in helping to evaluate the job performance. In recognition of the impact of SIWES in agricultural manpower development, Okorie (2000) stated that livestock industries should include enterprises in developing agricultural training programmes
especially designed to meet employers’ needs. However, the author warned that care must be taken not to limit the employment opportunities and job mobility of the products by putting them through straight-jacket-job specific training programmes.

In an attempt to suggest the solution to the nation’s skill gap, Adetokunbo (2009) noted that the Government and the industrial sector had put in place arrangements for professional students of tertiary institutions, including Agricultural Education students, to undergo short-term practical training in their chosen vocation like livestock production through a Student Industrial Work Experience Scheme (SIWES). Adetoro in Afolalu (2009) identified Student Industrial Work Experience Scheme (SIWES) as necessary for proper job preparation in livestock enterprise. The author stated that for productivity to be enhanced by graduates or new entrants into the livestock enterprise, there is really the needs to early exposure of students to the value and skills of the livestock industry. Therefore, without appropriate experiences and skills, young graduates are not properly prepared for work, norms, and role behaviour among others which students will face in livestock enterprise after school.

SIWES according to Olabiyi (2004) is hinged on the fact that it will meet the needs of students while in school and after graduation. The author
stressed that Students Industrial Work Experience Scheme has the advantage of preparing young people for employment in livestock industry which could lead to a rapid development of the country. According to ITF (2000) SIWES is a skill training programme designed to expose and prepare Agricultural Education students of institutions of higher learning for the Industrial Work situation they are likely to meet in livestock enterprise after graduation. When students are in school undertaking courses in farm animal production, they may not actually know what is obtainable in the livestock industry. On exposure to SIWES, they would be acquainted with the livestock production environment they will meet when out of school.

Section 15 of the ITF policy statement according to Olabiyi (2004) states, “Great emphasis will be placed on assisting certain products of post secondary school system to adopt or articulate easily to their possible post graduation job environment, the Fund will seek to forge a cooperation machinery with industry whereby students in institutions of higher learning may receive training in industry or commerce compatible with their area of study”.

SIWES gives room for the Agricultural Education students to get placement in livestock industry which portrays similar work environment with the environment they would work after graduation. Briel and Getzel
(2001) reported that internship experiences which is synonymous to SIWES would have a positive impact on the career development of Agricultural Education students which positively determine their survival after graduation.

Carter and Franta (1995) reported that internship experiences enable Agricultural Education students to test their career interests, enhance their career goals, gain transferable skills that are sought by employer after graduation and as well as increase their networking opportunities. According to Getzel, Briel and Kregel (2000) work experiences could assist Agricultural Education students when seeking employment in livestock enterprises after graduation. Kysor and Pierce (2000) noted that Agricultural Education students who engage in several career related work experiences while in College are able to secure employment easily after graduation, are more likely to be employed within their field of study, and are generally more satisfied in their current work position than graduates with no career related experiences. Reardon in Briel and Getzel (2001) noted that livestock job related experiences had been identified by livestock farm managers as being very important when recruiting College graduates for entry-level employment.
ITF and University of Jos, Jos (2011) noted that section 15 of ITF policy statement emphasized that great emphasis would be placed on assisting products of higher institutions to adopt or orientate easily to their possible post graduation job environment. A programme in the form of SIWES would work out cooperative machinery with the livestock industry, whereby Agricultural Education students of higher institutions could receive training in livestock industry as this would guarantee their employment after graduation.

Osinem and Nwoji (2010) asserted that the central focus of SIWES is to enlist and strengthen employers’ involvement in the educational processes of preparing students for work as they would engage after graduation. The authors maintained that the scheme helps to promote the much-desired technological know-how of Agricultural Education students for the advancement of the nation in addition to developing a skilled and articulated human resources needed in livestock enterprises.

Therefore, SIWES is vital for the Agricultural Education graduates of Colleges of Education to acquire practical competencies needed to prosper in livestock enterprise. The acquisition of skills in livestock production may not be possible in schools that do not have functional school farms. This
amplifies the reason for advocating SIWES for all the students including Agricultural Education students of Colleges of Education.

**SIWES and Techniques of Handling Agricultural Equipment and Machines in Agricultural Occupations**

In most institutions of higher learning, there is inadequate equipment and machines to turnout professionally skilled manpower into the labour market (Ochiagha, 1995). Osinem and Nwoji (2010) stated that SIWES provides Agricultural Education students opportunities to familiarize themselves with and expose them to agricultural tools, equipment and machines that were not available in their various institutions but which would be used after graduation. The Scheme expose Agricultural Education students to work methods and prepares them in safeguarding the work area and other workers in the agricultural industry.

Ukoha (1995) reported that lack of agricultural training facilities and equipment as well as inadequate social support inhibit effective agricultural skill development. The author complained that the agricultural occupational areas are saddled with the problems of insufficient number of relevant tools in good working conditions, insufficient classrooms, workshop materials and machines. In the 9th Biennial SIWES National Conference reported by ITF and University of Jos (2011), the conference noted with dismay, the
deplorable situation in institutions of higher learning with regards to availability of instructional materials and agricultural equipment for practical training. Consequently, the conference resolved that multinational companies should be encouraged to donate agricultural equipment and materials to agricultural institutions of higher learning for Agricultural Education students’ skills acquisition. This was in realization of the great roles agricultural equipment and materials play in practical skill development of Agricultural Education students.

Asele (2008) reported that visual instruction had become an integral part of every up-to-date educational programme, and used extensively by agricultural industries in teaching students on attachment. Asele contended that ITF workshop was very specific and practical in nature. It is therefore, necessary to use supplementary visual aids such as slides, films, charts, models and other concrete objects to actualize the processes of carrying out a particular operation to Agricultural Education students while in the workshop and in agricultural industries. The progressive and alert agricultural training instructors tend to resort to the use of such agricultural teaching aids to effect complete understanding on the part of their trainees.

Ekunke (2008) maintained that a critical assessment of the institutions revealed that some machines supplied by the Federal Government of Nigeria
as far back as 1982 to the Colleges were still lying in crates for lack of workshops to install them. Parts of these machines had depreciated, others had disappeared over night or converted to personal use by domestic thieves. Ekunke noted that in some cases, the few agricultural machines available had become too old to be used or broken due to lack of maintenance. This deficiency of agricultural equipment and machines according to the author could be ameliorated by the Agricultural Education students’ engagement in SIWES.

On the benefit of SIWES, Mafe (2010) reported that the Scheme enable Agricultural Education students appreciate work methods and gain experience in handling agricultural equipment and machinery which could not be available in their institutions. However, Mafe noted that some of the employers who accept Agricultural Education students for SIWES were unwilling to allow Agricultural Education students to handle agricultural equipment and machinery because of the fear that students might damage them. The author stressed that such employers should be informed that they were the ultimate beneficiaries of the pool of agricultural technical skills that were available in the economy since they require relevant agricultural production skills for the operation of their non-human resources and therefore should allow agricultural students ample opportunities to
manipulate their agricultural equipment and machines. Though, the author noted that the Agricultural Education students should be guided as they were using the agricultural equipment and machines.

Wodi and Dokubo (2009) revealed that agricultural equipment in schools were not found replicating those in the agricultural industry and the school personnel attitude to work did not compare favourably with those of personnel in the agricultural industry. The authors stressed that a situation where Agricultural Education workshop and laboratory equipment in schools were ill-maintained or not replaced for years with modern outfit does not augur well for the development of Agricultural Education. However, the authors contended that the ill-maintained agricultural facilities should be compensated by SIWES through the training of Agricultural Education students with modern agricultural equipment as they exist in agricultural industries.

The exposure of Agricultural Education students of Colleges of Education to agricultural industrial equipment and machines by SIWES would help to boost the agricultural technical know-how of the graduates in the agricultural enterprise. The Scheme would help Agricultural Education graduates of Colleges of Education to be acquainted with the methods and techniques of using the agricultural machines so that after graduation and
employment in agricultural industry, the use of the agricultural machines would be easy.

*SIWES and Transition from School to Agricultural Processing Enterprises*

The concept of agricultural skill acquisition is of great concern to every Nigerian both in private and public sector (Osinem, 2008). Olaitan, Igbo, Onyemachi and Ekong (1999) stressed that the situation was more worrisome especially now that the country was besieged with poor quality of Agricultural Education graduates from educational institutions, which had led to unemployment, antisocial behaviour, idleness, crimes, socio-economic problems, technological stagnation and poverty.

Okorie (2001) affirmed that through Student Industrial Work Experience Scheme, a meaningful work experience is combined with formal education thereby enabling Agricultural Education students to acquire agricultural knowledge, skills and appropriate work attitude which was essential for agricultural processing occupation progress after school. Rose in Olabiyi (2004) indicated that the agricultural industrial based instructor should make himself available to Agricultural Education students, listen carefully and ask thoughtful questions to gain participation in solving problems, planning and making decisions, seek assistance from the Agricultural Education students as they contribute to organizations’ growth
and effectiveness, and entertaining questions, select the right person for delegation of assignment bearing in mind that each person must be given opportunities to development on the agricultural processing training.

The rate of adaptation in agricultural processing occupation after school according to Umoh (2000) was dependent on the method of instruction in the agricultural industry which could be discussion, project or demonstration adopted, how demonstrative the method was, and importantly, the degree of students’ participation. The author maintained that the exposure of Agricultural Education students to work experience whether rotational or static on single operation and the quality of the agricultural processing training affect the level of agricultural skill acquisition. Agricultural Education students should not only be exposed on varied agricultural experiences but reasonable time should be spent on each stage of agricultural processing training to allow for enough practice necessary for habit formation.

Adetoro in Afolalu (2009) noted that industrial experience was necessary for agricultural processing job preparation. According to the author, productivity would be enhanced by experienced graduates who were exposed to the value and skills of agricultural industry and these would make them move smoothly into agricultural processing occupation after
graduation. Therefore, without appropriate agricultural skills and experiences young graduates were not properly trained on work norms, and role behaviour among others, which are essential components that would ensure success in agricultural processing occupation.

SIWES is similar to “school to work transition” programme of the United States of America which introduces the philosophy of school-based, work-based, and connecting activities to expose Agricultural Education students to potential future careers (Jen, 1992). It was designed to prepare Agricultural Education students to enter the job market (www.wikipedia.com). Bailey and Merritt in Mithang (1994) reported that the component of school-to-work transition programme should be the same with the component of new youth apprenticeship model which include: (1) designed to be integral part of education of a broad cross section of students; (2) integrates academic and vocational instruction; (3) combines classroom and on-the-job instruction; and (4), culminates in recognized and accepted credentials.

SIWES prepares Agricultural Education students for successful transition to agricultural processing occupation (Osinem, 2010). Mafe (2010) contended that SIWES helps in preparing Agricultural Education students for employment and makes transition from school to agricultural processing
enterprise easier after graduation. The author noted that Agricultural Education students that participate conscientiously in industrial training had the benefit of agricultural processing skills and competencies they acquired. These relevant agricultural processing skills remain a part of the recipients of industrial training as life-long assets which may not be taken away from them. The agricultural processing knowledge and skills acquired through training are internalized and become relevant when required to perform jobs or functions in agricultural processing occupation after graduation (Mafe, 2009).

The agricultural practical experience acquired by Agricultural Education graduates of Colleges of Education on SIWES help to enhance their job performance in agricultural processing enterprise (Osinem, 2010). The relevant production skills would help learners move smoothly from school to the field of agricultural processing occupation with minimum stress.

*SIWES and Application of Knowledge Gained in Theoretical Work into Practical Work in Forestry Industry*

Students Industrial Work Experience Scheme is an occupational experience programme that gives students the opportunity of putting into practice what they learned in theory (Umoh, 1995). Osinem and Nwoji
(2010) who contended that SIWES was a skill training programme designed to expose and prepare students of Agricultural Education in Colleges of Education for work situations, as they exist in the world of work. The authors further noted that SIWES helps to bridge the gap between theory learned in school and practice as they exist in the forestry industry.

According to Maclean and Lai (2011) Technical Vocational Education and Training (TVET) curricula had lost their relevance to the requirements of the labour market in many nations. The authors maintained that in many nations, employers including employers in forestry industry prefer to employ untrained youth or academic graduates and provide on-the-job training. In recent years, there was a shift in the traditional curricular balance between theory and practice in order to produce Agricultural Education graduates that would be efficient in practical work in the occupation of their choice especially in forestry. This was in agreement with Osinem and Nwoji (2010) who reported that before the establishment of SIWES, there was a growing concern among the industrialists that graduates of higher institutions especially Agricultural Education graduates, lacked adequate practical background needed for employment in forestry industries. The authors noted that it was against this need that SIWES was established to
close the gap between theoretical knowledge gained in school and the actual occupational skills needed in the forestry industry.

Discussing the problem of SIWES as it affects the objective of applying the knowledge gained in theoretical work into practical work, the Industrial Training Fund and University of Jos (2011) reported that most agricultural industries in Nigeria were operating below installed capacity while others were completely shut down. This had impacted negatively on the scheme as institutions of higher learning found it increasingly difficult to secure placement for Agricultural Education students in agricultural industries where they could acquire the needed agricultural practical experience essential for occupational skills required in the forestry industry. Okorie in Olabiyi (2004) reported that since the inception of the Scheme, participating Agricultural Education students, employers, and coordinators had consistently endorsed the Scheme as it was aimed at complementing theoretical and other phases of classroom work with agricultural practical work experience. The author maintained that SIWES provided an excellent opportunity for Agricultural Education students to develop desired technical capabilities which balanced practical knowledge obtained in the forestry industry with information obtained in schools.
In discussing the problem of agricultural practical skill acquisition by SIWES students, Afolalu (2009) stated that some of the Agricultural Education students who took part in the survey revealed that the place of their SIWES lacked adequate modern agricultural facilities and personnel. Afolalu further stated some Agricultural Education students claimed that there were some restrictions on the agricultural facilities they used. The author recommended that the hindrances could adversely affect the ability of Agricultural Education students in transforming the theoretical knowledge gained in agricultural class into practical skills in the forestry industry.

Ugwuanyi (2010) noted that practical knowledge relates to doing. According to Ochiagha (1995) practical knowledge is learning without which mastery of an area of knowledge would be difficult to achieve. Ochiagha stressed that practical knowledge involved developing skills through the use of tools or equipment to perform tasks that were related to a field of study. Ugwuanyi (2010) reported that it was against this background that SIWES was introduced in Nigerian tertiary institutions to enable students put into practice the knowledge gained in classroom theory.

Mafe (2010) noted that theoretical knowledge alone would not prepare an educated person for work in the forestry industries. The author contended that the worker or productive individual must not only be knowledgeable but should be versatile in the application of agricultural skills to perform defined jobs or work in the forestry industry. In his effort to express the benefits accruing to Agricultural Education students who
participate conscientiously in industrial training, Mafe (2010) explained that SIWES provides to the students the opportunity to blend theoretical knowledge acquired in the classroom with practical hands-on-application of knowledge required to perform work in the forestry industry.

Agricultural Education graduates of Colleges of Education cannot be said to be professionals and competent in forestry with only theoretical knowledge acquired in school (Osinem and Mama, 2008). They could be made competent in forestry and other areas of agriculture by blending the theoretical information with practical skills which are acquire in forestry and other industries during SIWES. Therefore SIWES is planned to expose the Agricultural Education students to the practical skills which were lacking in Colleges of Education but could be obtained in the agricultural industry so as to make the theoretical knowledge acquired in school meaningful.

**Conceptual Framework of the Appraisal of Students Industrial Work Experience Scheme on Graduates’ performance in Agricultural Education in Colleges of Education**

Figure 1: Schema on the Appraisal of Students Industrial Work Experience Scheme on Graduates’ performance in Agricultural Education in Colleges of Education.
SIWES is aimed of equipping Agricultural Education students of Colleges of Education with work skills, methods and processes by exposing and preparing them for work situations as they exist in agricultural industries (Osinem, 2010). However, SIWES has some objectives which it should achieve. The specific purposes of the study were derived from the objectives of the programme. Agricultural education students are sent on SIWES to acquire agricultural skills that would make them proficient in agricultural occupation. The Agricultural Education students are attached to agricultural industries that provide the training on agricultural skills. After a minimum of three years, Agricultural Education students would graduate and be employed. It becomes necessary to appraise the graduates that passes through SIWES to find out how much of the agricultural skills they had acquired during SIWES training. Agricultural production managers of agricultural industries and secondary school agricultural science heads would provide the data for the appraisal, hence the effect of the programme on the graduates will be ascertained.
Theoretical Framework

Theory of Skill Acquisition

The theory of skill acquisition was illustrated by Sedaei (2003) using a theory propounded by Hubert and Stuart Dreyfus in 1973 who assumed that skill development is the distinction between “knowing that” and “knowing how”. The authors argued that many skills, such as riding of a bicycle could not simply be reduced to “knowing that”.

According to Sedaei(2003), the authors explained that a person goes through at least five stages of different knowledge of specific task and ways of decision-making as he acquires and improves on his skills. These five stages are: novice, advanced beginner, competence, proficiency, and expertise. The authors believed that as human beings acquire a skill through instruction and experience, they do not appear to leap suddenly from rule-guided “knowing that” to experience-based “knowing how”. The authors affirmed that there is a gradual process involved for an individual to go through the five stages in order to reach the stage of expertise or knowing how.

In the novice stage according to the authors, the individual has some general ideas and is in the process of learning the rules. The second stage which is the advanced beginner, the individual’s performance improves to a
relatively acceptable level only after the novice has had enough experience and practice in copying the real situation. The theory explained that during the third stage which is competence, the learner starts becoming personally involved with the task. He starts to perceive more than one option from which he has to choose the best one. In the fourth stage or proficiency stage, the learner while intuitively understanding his task, still thinks analytically about his actions. The last stage which is the expertise, the propounders maintained that they know what to do based on mature understanding of the task. An expert has had so much experiences with the task that the skill of doing the task is a part of him. He acts upon correct intuitions without analytically thinking about his every move. However, the authors asserted that practice is required for the learner to maintain the knowing-how. Without practice, the expert will gradually lose his expertise and is most likely to regress as far back as the advance beginner stage.

It is worthy to mention that SIWES gives Agricultural Education students of Colleges of Education ample opportunity to practice agricultural skills in Agricultural Industries while on attachment. This gives the students windows of opportunity to progress from the stage of novice through the stage of advance beginner to the stage of competence. This study anchors on this theory of skill acquisition propounded by Hubert and Stuart Dreyfus. In
line with the theory, SIWES gives room for the Agricultural Education students to have practical knowledge of agricultural operations as they exist in agricultural industries. This practical knowledge will not only assist the students to move from one stage of agricultural skill acquisition to the other but will also help them to retain the skills.

**Experiential Learning Theory**

Experiential learning theory was propounded in 1984 by David Kolb. David Kolb was a Professor of Organizational Development at Case Western Reserve University, Cleveland, Ohio (Kolb, 1984). According to Kolb in Kolb and Boyatzis (1999), experiential learning theory (ELT) defines learning as the process whereby knowledge is created through the transformation of experience. The authors maintained that knowledge results from the combination of grasping and transforming experience. The ELT portrayed two dialectically related modes of grasping experience – Concrete Experience (CE) and Abstract Conceptualization (AC); and two dialectically related modes of transforming experience - Reflective Observation (RO) and Active Experimentation (AE). Kolb stated that in four-stage learning cycle, immediate or concrete experiences are the basis for observation and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can
be drawn. These implications can be actively tested and serve as guides in creating new experiences. Kolb and Boyatzis (1999) stated that in grasping experience some of individuals perceive new information through experiencing the concrete, tangible, felt qualities of the world, relying on the senses and immersing one self in concrete reality. Others tend to perceive, grasp or take hold of new information through symbolic representation or abstract conceptualization - thinking about, analyzing or systematic planning, rather than using sensation as a guide. In transforming or processing experience some persons tend to carefully watch others who are involved in the experience and reflect on what happens, while others choose to jump right in and start doing things. The watchers favour reflective observation while the doers favour active experimentation.

SIWES gives the Agricultural Education students of Colleges of Education the opportunity to experience real life situations in agricultural industries as some of the students learn more by having concrete experience of the subject matter. The concrete experience aspect of the task demonstrated by touching, feeling and manipulating in concrete terms the different aspects of the job they are learning will in turn promote reflection which will enhance their agricultural skill acquisition in agricultural industries.
Theory of Work Adjustment

The theory of work adjustment was developed by Rene Lloyd, Rene Lofquist and George (1968). The theory was based on the concept of correspondence between the individual and the environment. Correspondence between an individual and his environment implies conditions that could be described as a harmonious relationship between the individual and the environment. The authors stated that correspondence is a relationship in which the individual and the environment are corresponsive i.e. mutually responsive. The individual brings into this relationship his requirement of the environment (work); the environment likewise has its requirements of the individual. It was the basic assumption of the theory of work adjustment that each individual seeks to achieve and maintain correspondence with the environment (work). The individual’s skills enable him to respond to the requirements of the work environment. Conversely, the rewards of the work environment enable it to respond to the requirements of the individual. When their minimal requirements are mutually fulfilled, the individual and the work environment are described as correspondent.

When an individual enters a work environment for the first time, his behaviour is directed towards fulfilling its requirements. According to the
authors, the individual also experiences the rewards of the work environment. If he finds a correspondent relationship between himself and the work environment, the individual seeks to maintain it. If he does not, he seeks to establish it, or failing in this, to leave the work environment. The authors opined that in many cases, the initial relationship is not correspondent. In addition, both the individuals and the work environment are constantly changing. Therefore the continuous and dynamic process by which the individual seek to achieve and maintain correspondence with his work environment is called work adjustment.

The achievement of minimal correspondence enables an individual to remain in a work environment. Remaining in the work environment in turn, allows the individual to achieve more optimal correspondence and stabilize the correspondent relationship. This inability of the correspondence between the individual and the work environment is manifested as tenure in the job. As correspondence increases, the probability of tenure i.e. remaining on the job increases. Conversely, as correspondence decreases, both the probability of remaining on the job and the projected length of tenure decrease.

However, if an individual has substantial tenure, it can be inferred that he has been fulfilling the requirements of the work environment and that the
work environment has been fulfilling its requirements. If the individual fulfils the requirements of the work environment, he is defined as a satisfactory worker. Consequently, if the work environment fulfills the requirements of the individual, he is defined as a satisfied worker. Satisfactoriness and satisfaction therefore indicate the correspondence between the individual and his work environment.

The skills Agricultural Education graduates of Colleges of Education acquire through SIWES help them to build correspondence (harmony) between them and work environment after graduation. This will help the graduates become satisfied with the work and therefore increase the length of tenure in the Agricultural Industry.

*Two-factor theory of Job Satisfaction*

The two-factor theory developed by Herzberg and cited in Manisera, Dusseldorp and Vander (2005). The theory stated that job satisfaction and job dissatisfaction are caused by different and independent set of factors.

The theory postulated that job satisfaction is caused by a set of factors related to the work itself, such as the nature of job, achievement in the work, possibilities of personal growth and recognition, and promotion opportunities. These factors are called motivators by Herzberg as they should motivate people to higher performances. On the other hand, job
dissatisfaction is a result of conditions that surround the doing of the job such as (physical) working conditions, salary, company policies, job security, quality of supervision, and relations with others. Herzberg called these factors hygiene factors. These are not an intrinsic part of a job but they refer to the environment and have the function of preventing job dissatisfaction. The hygiene factors must be continually maintained by management because they are never completely satisfied.

It was stated that if hygiene factors are at a very low level, workers are dissatisfied though the reverse is not true when hygiene factors are satisfied and the environment is good, workers are not dissatisfied but neither necessarily satisfied and they are not motivated to higher performance. However, when motivators are satisfied, workers are satisfied and often this satisfaction leads to better performance.

SIWES helps Agricultural Education graduates of Colleges of Education to acquire the necessary skills and competencies required in the performance of agricultural operations. This will help in work achievement, increase in work efficiency and happiness of the worker. The work achievement and competency possessed by the graduates will serve as motivators and morale boost which will promote higher performance in the
field of agricultural occupations and consequently increase their satisfaction on the job.

Theory of Multiple Intelligences

The theory of multiple intelligences was developed by a psychologist and a Professor of Neuroscience from Harvard University, Howard Gardner in 1983 and was cited in Educational Resources of Great Performances. According to the theory, human beings have nine different kinds of intelligences that reflect different ways of interacting with the world. The theory postulates that each person has a unique combination or profile. Although each has all nine intelligences, no two individuals have them in the same exact configuration similar to the fingerprints. The theory defined intelligence as: the ability to create an effective product or offer a service that is valued in a culture; a set of skills that make it possible for a person to solve problems in life; the potential for finding or creating solutions for problems which involves gathering of new knowledge (Arnold and Fonseca, 2004).

The theory postulate the nine multiple intelligences as follow:

1. Linguistic intelligence: the ability to use language to express what is on ones mind and to understand other people. Any kind of writer, orator, speaker, lawyer among others possess this kind of intelligence.
2. Logical/mathematical intelligence: the capacity to understand the underlying principles of some kind of causal system, think conceptually in logical and numerical patterns, making connections between pieces of information.

3. Musical/Rhythmic intelligence: the capacity to think in music, to be able to hear patterns, recognize them, and perhaps manipulate them.

4. Bodily/kinesthetic intelligence: the ability to use your whole body or parts of your body (hands, fingers, arms) to solve problem, make something, or put on some kind of production.

5. Spatial intelligence: the capacity to think in graphics and create graphic mental images that aids information retention.

6. Naturalist intelligence: the ability to discriminate among living things (plants, animals) and sensitivity to other features of the natural world (clouds, rock configurations)

7. Interpersonal intelligence: the ability to understand other people, the ability to sense feelings, intention and motivation of others.

8. Intrapersonal intelligence: the ability to understand oneself, knowing who you are, what you can do, what you want to do, how you react to things, which things to avoid, and which things to gravitate toward.

SIWES gives Agricultural Education students of Colleges of Education the opportunity to develop their kinesthetic and naturalist intelligences as they engage in hands-on experience in agricultural industries. The relationship of the Agricultural Education students with the agricultural industry staff will help the students develop their interpersonal and intrapersonal intelligences which will eventually help them relate well with their fellow staff after graduation and employment.

Models of Evaluation

An evaluation model according to Okoro (1991) may be regarded as a set of steps or a system of thinking which if followed or implemented will result to the generation of information which can be used by decision makers in the improvement of educational programmes. Okoro noted that evaluation models are of great help to evaluators because they provide a general guide which could be adapted or modified to suit specific programmes being evaluated. Some of the evaluation models are discussed as follow:
The CIPP Evaluation Model

The CIPP evaluation model was developed by Stufflebeam in 1971. The model regards evaluation as a continuing process requiring a systematic programme of implementation and involving a cooperation between the evaluator and the decision maker.

The CIPP evaluation model according to Okoro (1991) identifies four types of evaluation which include context evaluation, input evaluation, process evaluation and product evaluation. Context evaluation is concerned with the determination and the validation of goals and objectives. It is usually employed when a programme is being planned and it helps to describe the prevailing environment and the needs, problems and conditions in the environment. Input evaluation provides information on resources available and how resources may be used to achieve desired ends. Input evaluation may entail the assessment of staff, physical facilities, equipment, library resources and other resources that will be involved in the educational programme. Process evaluation is undertaken during the process of programme implementation and provides periodic feedback on the quality of implementation. Product evaluation however determines the effectiveness of the programme in achieving the objectives and goals of the programme. It is mainly used when course offerings have been completed and when some
learners have graduated from the programme. Product evaluation relates programme outcomes to programme objectives and process components.

However, it is important to appraise Agricultural Education graduates of Colleges of Education who are the product of SIWES to ascertain the extent the objectives of SIWES in Agricultural Education have been achieved. The result obtained from the appraisal of the Agricultural Education graduates will help to ask and answer questions on the context, input and process of SIWES implementation in Agricultural Education in Colleges of Education.

*The Formative Evaluation Model*

Formative evaluation according to Wall (1994) is also known as process or implementation evaluation, and it is performed to examine various aspects of an ongoing programme in order to make changes/improvements as the programme is being implemented. The author stated that this model of evaluation attempts to document exactly what is transpiring in a programme. Data are collected and analyzed at a time when programme changes can be made to ensure that the quality of the programme implementation is maintained throughout.

Though the present study is not hinged on formative evaluation, the result obtained from the appraisal of Agricultural Education graduates of
 Colleges of Education will help to determine whether the overall SIWES in relation to Agricultural Education in Colleges of Education is well implemented or not. Hence, this will help the ITF to assess the SIWES implementation strategies and correct every identified abnormality to make the programme achieve its purpose.

*The Countenance Evaluation Model*

This model was developed by Robert Stakes in 1967. The countenance model of evaluation is based on comparison of planned outcomes to the actual performance. The model stipulates that the standard of performance on which outcomes are judged are established by the evaluators and programme actors. In the present study, the actual performance of NCE Agricultural Education graduates of Colleges of Education who passed through SIWES will be ascertained. This result will be compared with the planned outcomes which are the objectives of SIWES in Agricultural Education in order to pass judgment on whether the objectives of SIWES in Agricultural Education in Colleges of Education have been achieved or not.
The **Summative Evaluation Model**

This evaluation model is used to evaluate a programme or product after it has been fully implemented and is fully functional to determine how worthwhile the final programme or product is (Gall, Gall and Borg, 2007). Specific goals of the programme are identified and the degree of accomplishment of these goals are documented (Wall, 1994). The author noted that the results of a summative evaluation might point to changes that should be made in a programme in order to improve it in subsequent implementations. The results of summative evaluations could specify programme status and conditions for accountability purposes. The results could also be used as needs assessment for the subsequent planning of changes in a programme or of the introduction of new programmes and interventions. Olaitan (2003) described it as terminal evaluation. Terminal evaluation is carried out at the completion of programme implementation. Olaitan stated that the purpose is for the improvement of planning and design of future programmes.

When considered in the context of the reviewed evaluation models above, the present study would appropriately hinge on the summative evaluation model because it is geared towards assessing the product of SIWES in Agricultural Education in Colleges of Education to find out
whether the objectives of SIWES in Agricultural Education have been achieved or not. Secondly, the assessment is being carried out after the total implementation of the programme, that is, when the Agricultural Education students of Colleges of Education have ended the programme and are at their respective places of work. However, models were reviewed to address appraisal while theories were reviewed to address skills which are acquired through SIWES.

**Related Empirical Studies**

Some related empirical studies have been identified in the area of this study. Adekola (2001) conducted a study on evaluation of SIWES supervision in Delta State. The objectives of the study were to determine whether students on Industrial Work Experience were effectively supervised by the Training Supervisors and Training Sponsors and again finding out what factors that militate against the effective supervision of SIWES. The study adopted descriptive survey design.

The population for the study comprised: 3,387 second year students in four accredited tertiary institutions in Delta State; all the industrial based supervisors from 220 employers who participated in the 1999 SIWES as well as the ITF Supervisors who took part in the SIWES supervision of students in Delta State in 1999. In addition, all the Institution-based
Supervisors from the four accredited tertiary institutions in Delta State were involved. Simple random sampling technique was used to select: 109 students from the four institutions; 20 ITF supervisors who participated in SIWES supervision in 1999; 31 institution based supervisors who participated in SIWES supervision in 1999; and 40 Industry-based Supervisors from the list of employers.

Questionnaire was used to collect data while mean and t-test statistic were used to answer research questions and test hypotheses at 0.05 level of significance (p). The study found that the industry-based supervisors hardly give adequate supervision. It also found that the ITF supervisors did not visit students on SIWES supervision. The recommendations of the study among others included, that supervisors should endeavour to discuss training plans and students’ progress with the industry-based supervisors during SIWES programme. It also recommended that there was the need to urgently ensure that SIWES supervision was carried out on regular basis.

The present study is related to Adekola’s study in that both studies are concerned with Students Industrial Work Experience Scheme (SIWES). Both studies as well applied survey research design for their investigations. They are equally similar in the use of Mean statistical tool to answer
research questions. However, the two studies have different specific purposes, population and area of studies.

Similarly, Jen (1992) studied the appraisal of the Students Industrial Work Experience Scheme Programme in Nigerian Polytechnics. The major purpose of the study was to determine the status of SIWES programme in Nigerian polytechnics with a view to highlighting the constraints which contribute to inefficiency in operating the scheme.

A descriptive survey research design was used for the study with a population of: 700 students in the three polytechnics in North Eastern States of Adamawa, Bauchi and Borno that participated in the 1991 SIWES programme; 50 scheduled polytechnics SIWES coordinators and supervisors in the three polytechnics who participated in 1991 SIWES supervision; and 50 identified training sponsors (Industry-based Trainers) in the 1991 SIWES placement list, who participated in the SIWES supervision and training.

All the Polytechnics SIWES Coordinators and the Industry-based Trainers were used in the study while 315 students were drawn using proportionate stratified random sampling technique. The data for the study were collected using questionnaire. The data were analyzed using mean to answer the research questions and ANOVA to test the hypotheses at 0.05 level of significance(p). It was found that there were little facilities in
institutions and training establishments for training of students on SIWES. The study also found that the placement of students on SIWES generally met the criteria for establishment of viable SIWES training stations. The author recommended among others that much efforts should be made to improve on the provision of adequate training facilities for SIWES, the procedure for student placement needed to be improved greatly and that the SIWES operational guidelines as published by the ITF should be made to bear on the various public organisations involved with the SIWES programme.

The present study is related to the work of Jen(19920 because both studies are concerned with SIWES appraisal. They are equally similar in the use of survey research design as well as the use of Mean and ANOVA to answer research questions and test hypotheses respectively. Both studies had different specific purposes and populations.

Umoh (2000) conducted a study on the evaluation of the implementation of Students Industrial Work Experience Scheme (SIWES) in Agriculture in Colleges of Education in Eastern Nigeria. The objectives of the study was to determine which of the specifications in the guidelines of ITF on SIWES implementation were adopted by the Colleges of Education in Eastern Nigeria; assess the adequacy and quality of personnel provided in the Colleges for the implementation of SIWES in agriculture; determine the
role expectation of the supervisors in SIWES implementation in agriculture; and identify guidelines for improving the implementation of SIWES programme in agriculture in Colleges of Education in Eastern Nigeria.

The study adopted a survey research design with a population 638 comprising 40 SIWES administrators, 61 College-based supervisors and 537 NCE III Agricultural Education students. The sample for the study included 40 SIWES administrators, 61 College-based Supervisors and 300 NCE III Agricultural Education Students of the Colleges of Education in Eastern States of Nigeria. Data were collected using questionnaire while percentage and mean were used to answer research questions and t-test to test the null hypotheses.

The author found that the implementation of the programme by the Colleges of Education was not effective, the SIWES Coordinators appointed by the College authorities to man the central SIWES Coordinating Units in the Colleges were not professionally and academically competent, the identified role expectations could be used to guide the College-based Supervisors while on supervisory visits to the students in the industries. The study also identified some guidelines for improving the implementation of SIWES programme. It was recommended that both the NCCE and the ITF should set up independent implementation teams to monitor the
implementation of SIWES to ensure strict compliance to the ITF approved
guidelines on SIWES. It was also recommended that the ITF should outline
specific role expectations of the College-based Supervisors in SIWES
programme implementation in agriculture to incorporate those identified by
the study.

The present study is related to Umoh’s study because both studies
dwell on the assessment of SIWES in Agricultural Education in Colleges of
Education. Equally, both studies adopt the same design. However, they have
different specific purposes, population and different statistical tools to
analyse data.

In the study carried out by Onwubiko (2003) on the assessment of the
Supervised Students Industrial Work Experience Scheme in industries in
Abia State. The major purpose of the study was to ascertain the perception
of the supervisors on the effect of some identified problems constraining
supervising students on industrial work experience scheme in industries in
Abia State. The study was carried out in Abia State. Survey research design
was used.

The population was 51; comprising 20 industrial supervisors, 18
institutional supervisors and 13 ITF supervisors. The entire population was
used in the study. Questionnaire was used to collect data from the
respondents while mean and standard deviation were used to answer research questions, and ANOVA was employed in testing the null hypotheses. The study found out among others that inadequate transport facilities for ITF made it impossible for it to visit various students locations for assessment; that there was need to streamline courses for which student should go on for attachment such as the Technological, Science, Agriculture, Environmental and Physical oriented courses; that ITF did not often visit training stations to inspect their training facilities whether it meets the standard required for the student to train on and that delays in payment of the student allowance causes distraction of students concentration especially in this hard times.

The study is related to the present study because both studies assessed students Industrial Work Experience Scheme. Both studies as well have the same design. They chose the same statistical tools for answering research questions and testing of hypotheses. Meanwhile, the have different purposes, population and area of studies.

Olabiyi (2004) studied on the relevance of Student Industrial Work Experience to skill acquisition among technical college students in Lagos State. The objectives of the study among others were to determine who participate in placing students for Industrial Work Experience; determine
how students participation in practical work should be at their various places of placement; identify the constraints to effective participation of students in skill acquiring projects and to determine how students supervision should be at their place of placement.

The study was carried out in Lagos State and survey research design was employed. The population was 1422; comprising 1360 year III students of technical colleges in Lagos State and 62 teachers/supervisors from these schools. The author sampled 385 respondents representing 323 students drawn by stratified random techniques and the entire 62 teachers. The study used questionnaire to collect data. The data collected were analyzed using mean and standard deviation to answer research questions and t-test statistic to test the null hypotheses at 0.05 level of significance(p).

The study found different constraints that hinder the effective participation of students in acquiring skills; the ways of improving students’ participation in Industrial Work Experience and the criteria in placement of student for Industrial Work Experience among others. The study recommended among others that ITF needed to embark on efficient implementation strategy required to achieve the reviewed objectives of SIWES in order to structure, standardize and make more effective the process of imparting practical skills to student on attachment; there should
be an urgent establishment of SIWES Coordinating Units in all institutions participating in SIWES; and that there should be a law or decree specifying sanctions on corporate organisations and their officers for refusal to accept students for industrial attachment.

The present study is related to Olabiyi’s because both addressed Students Industrial Work Experience Scheme. They apply the same design for their investigations. However, both studies have different purposes. They adopt different sampling technique and have different statistical tools for data analysis.

Wodi and Dokubo (2009) studied the appraisal of Students Industrial Work Experience Scheme in five tertiary institutions in Rivers State, Nigeria. The major purpose of the study was to evaluate the extent to which the agencies involved in the operation and management of SIWES function to promote the skill acquisition of students.

The population for the study was made up of students and staff from disciplines and institutions involved in SIWES in Rivers State. Sample comprised of 240 students and 18 staff from five tertiary institutions in Rivers State. Questionnaire was used to collect data for the study. Frequency, percentage and mean were used to answer research questions while chi-square was used to test the null hypotheses.
The study found that majority of the students taking part in Students Industrial Work Experience Scheme were aware of the objectives for which it was established. It was also found that school equipment were not found replicating those in the industry and that the school personnel attitude to work did not compare favourably with that of personnel in industry.

The study recommended among others that the ITF should ensure the regular visitation of the ITF officers to supervising agencies, institutions, employers and students on attachment; the log book issued to students on attachment by institutions must be checked and signed by the institutions and ITF supervisors responsible during supervision were not in their offices at the end of attachment and that the institutions involved should be organizing orientation courses in collaboration with the ITF for their students prior to attachment with the attendance made mandatory for the students and the ITF staff.

Wodi and Dokubo’s study is as well related to the present study because both studies involved in the appraisal of SIWES. Both studies apply survey research design. They are different in that both have different purposes, population, area of studies and different statistical tools to answer research questions and test hypotheses.
Afolalu (2009) carried out a study titled towards effective SIWES curriculum development in applied sciences for adequate skill utilization: A case study of the school of Applied Science, Nuhu Bamalli Polytechnic, Zaria. The objectives of the study included: to investigate the competence of the cooperating organization in the provision of adequate training to students on SIWES; to find out the major consideration by the students in the choice of place of attachment; to find out whether the duration of SIWES was considered adequate; and to find out whether the students were given unhindered access to facilities at the place of SIWES or not. The study used questionnaire to gather information.

A total population of 50 students were used in the study. The study used mean to answer research questions. It was found that the choice of placement of SIWES students was not based on interest for future entrepreneurship development; the place of students SIWES attachment lacked adequate modern facilities and there were restrictions on the use of facilities to students. It was also found that the duration of SIWES programme was not enough for students to acquire skill that would enable them set up their own business ventures. The study recommended that the choice of industrial training should be based on the interest and future plans for entrepreneurial development; the SIWES Unit in various institutions
should be adequately equipped and that the ITF should ensure that SIWES allowances for students were paid during the period of attachments.

However, Afolalu’s study is related to the current study because both focused on SIWES. They applied the same design for their studies. However, the studies have different specific purposes, area of studies, population and different tools for data analysis.

**Summary of Related Literature**

There was a consensus among the authors that SIWES is a good avenue for graduates to acquire agricultural experiences and skills required for success in crop production. They believed that SIWES is the key factor in enhancing the efficiency and expertise of the workforce. Generally, the authors agreed that SIWES helps in the preparation of Agricultural Education students for working in livestock enterprise after graduation. When students undergo short training in industries, it would acquaint them with the processes and procedure inherent in agricultural enterprise. The experts tended to agree that SIWES helps the participants to acquaint themselves with work methods and techniques of handling agricultural equipment and machines needed in agricultural occupations. However, some authors noted that some industries refused to allow students on
attachment to use some of their equipment and machines for the fear of
damage.

The authors were generally in agreement that students industrial work
experience scheme assists graduates in transition from school to agricultural
processing enterprise for enhancing job performance. They believed that
students who participate conscientiously in industrial training have the
benefit of acquiring skills and competencies which will equip them in
transiting smoothly from school to the world of work. In terms of
opportunity of applying the knowledge gained in theoretical work into
practical work in forestry industry, the authors agreed that SIWES helps to
bridge the gap between theory learnt in school and practice as they exist in
industry.

Theoretical framework was also presented. Five theories related to
the study found to be relevant were theory of skill acquisition, experiential
learning theory, theory of work adjustment, two-factor theory of job
satisfaction and the theory of multiple intelligences. Four models of
evaluation were reviewed. The review also covered some related empirical
studies. The related empirical studies reviewed revealed that some of the
studies focused on the problems faced by Students Industrial Work
Experience Scheme, the problem of SIWES supervision while others were
on placement of students and facilities for training by industries. However, there is no identified study that assessed the extent of realization of the objectives for which SIWES in Agricultural Education was established. Hence, the present investigation is geared towards filling the gap.
CHAPTER THREE

METHODOLOGY

This chapter described the procedure adopted for the study, which was discussed under the following sub-headings: design of the study, area of the study, population for the study, instrument for data collection, validation of the instrument, reliability of the instrument; method of data collection; and method of data analysis.

Design of the Study

This study adopted a descriptive survey research design. Descriptive survey research design according to Osuala (2001) is the design that focuses on people, the vital facts of people, and their beliefs, opinions, attitudes, motivation and behaviour. Nworgu (2006) described descriptive survey research design as those studies which aim at collecting data on, and describing in a systematic manner the characteristics, features or facts about a given population. This type of design uses questionnaire to collect data from the respondents. This design was considered appropriate for the study because opinions of Secondary School Agricultural Science Heads and Managers of Agricultural Industries were collected from a fraction of them considered to be representative of the entire group in Enugu State using questionnaire as the instrument for data collection.
Area of the Study

The study was conducted in Enugu State of Nigeria. Enugu State is made up of six educational zones which include: Agbani, Awgu, Enugu, Nsukka, Obollo-Afor and Udi with seventeen Local Government Areas. Agbani Educational zone is made up of Enugu South, Nkanu East and Nkanu West Local Government Areas. Awgu Educational Zone is made up of Aninri, Awgu and Oji River Local Government Areas. Enugu Educational zone is made up of Enugu East, Enugu North and Isi-Uzo Local Government Areas, Nsukka Educational Zone is made up of Igbo-Etiti, Nsukka and Uzo-Uwani Local Government Areas, Obollo-Afor Educational zone is made up of Igboeze North, Igbo-Eze South, and Udenu Local Government Areas while, Udi Educational zone is made up of Ezeagu and Udi Local Government Areas respectively. The choice of Enugu State was because there is no identified empirical study on the appraisal of SIWES on graduates’ performance in Agricultural Education in the area.

Population for the Study

The population for this study was 501 respondents which consisted all the 462 Secondary School Agricultural Science Heads. The Secondary School Agricultural Science Heads in Enugu State is comprised of 61 from Agbani Zone, 67 from Awgu Zone, 113 from Enugu Zone, 78 from Nsukka
Zone, 74 from Obollo-Afor Zone and 69 from Udi Zone (Ministry of Education, Enugu, 2011).

All the 39 identified Managers of Industries of Agriculture in Enugu State were used in the study (ITF Area Office, Enugu, 2011). This population was chosen because Agricultural Education students after graduation from Colleges of Education could teach in Upper Basic (Junior Secondary) schools and could be supervised by the Agricultural Science Heads in the respective schools who invariably should be in Senior Secondary section of the schools. The students after graduation could as well work in agricultural industries located in different parts of the state and could be supervised by the manager of the respective industries. These research subjects can give authentic information about the performance of the workers under them.

**Sample and Sampling Technique**

A total sample size of 253 respondents were drawn for the study. The sample size of 214 for the Secondary School Agricultural Science Heads was established using Yaro Yamane formula:

\[
 n = \frac{N}{1 + N(e)^2}
\]

Where:  
\( n \) = sample size  
\( N \) = the population  
\( e \) = level of significance  
1 = unity (a constant) (Uzoagulu, 2011)
Proportionate random sampling technique was used to draw 46.5% of the Secondary School Agricultural Science Heads from each of the six educational zones in the State, making a sample size of 214 Secondary School Agricultural Science Heads. The entire 39 identified Managers of Agricultural Industries in the State were included in the study. No sampling was made because of its manageable size.

**Instrument for Data Collection**

The instrument for data collection was Appraisal of Students Industrial Work Experience Scheme (ASIWES) questionnaire. The questionnaire items were generated from the review of related literature. The questionnaire was made up of two parts. Part 1 dealt with general information on the personal profile of the respondents while part 2 collected information to answer research questions and test hypotheses.

Part 2 was divided into five sections (A-E). Section A dealt with research question one. It consisted of 14 items. The items dealt with the extent to which Students Industrial Work Experience Scheme has enabled Agricultural Education graduates of Colleges of Education to acquire agricultural experiences and skills required for success in crop production. It was structured on a five-point rating scale of Very Great Extent (VGE), Great Extent (GE), Moderate Extent (ME), Little Extent (LE) and Very
Little Extent (VLE). Section B dealt with research question two. It contained 20 items that was used to determine the extent to which SIWES has equipped Agricultural Education students for working in livestock enterprises after graduation. It was also structured on a five-point rating scale.

Similarly, section C dealt with research question three. The section covered 15 items which was used to determine the extent to which SIWES has exposed Agricultural Education students in handling agricultural equipment and machines that are necessary for carrying out agricultural production. It was as well structured on a five-point rating scale. Section D dealt with research question four. The section contained 18 items that was used to determine the extent to which SIWES has enhanced easier transition of Agricultural Education graduates from school to agricultural processing enterprise. It was structured on a five-point rating scale. Finally, Section E dealt with research question five. It contained 13 items that was used to determine the extent to which SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry. It was structured on a five-point rating scale (See Appendix C).
Validation of the Instrument

The instrument was face validated by three experts in the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The validates made useful comments and corrections. For example, in the use of specific crops like maize, cassava among others, instead of crop. Though the number of item statements before and after validation were the same, the comments and corrections suggested were effected to improve the quality of the questionnaire both in structure and content.

Reliability of the Instrument

The reliability of the instrument was established using Cronbach alpha to determine the internal consistency. The instrument was administered on 20 Agricultural Science Heads in Awka, Anambra State. Their responses were used to calculate the reliability which yielded a coefficient of 0.85.

Method of Data Collection

Copies of the questionnaire were administered on the respondents by the researcher with the help of six research assistants, each research assistant representing each of the Educational Zones while the researcher coordinated the activity. The respondents were given two weeks within which to study and respond to the questionnaire. However, 253 copies of ASIWES
questionnaire were administered to the respondents, out of which 240 copies were retrieved, thus representing 94.86% return rate.

**Method of Data Analysis**

Mean was used to answer the five research questions. Values were assigned to different scaling points of the questionnaire and corresponding mean scores were interpreted using real limit of numbers. Any item statement that had a mean score of 4.50 and above was interpreted as Very Great Extent, 3.50 – 4.49 as Great Extent, 2.50 - 3.49 as Moderate Extent, 1.50 - 2.49 as Little Extent and 0.50 – 1.49 as Very Little Extent.

However, the five null hypotheses were tested using t-test statistical tool at 0.05 level of significance(p) and 238 degrees of freedom. Any null hypothesis whose t-calculated value was less than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom was upheld while any null hypothesis whose t-calculated value was greater than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom was rejected.

<table>
<thead>
<tr>
<th>Scaling Item</th>
<th>Normative value</th>
<th>Range of mean score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Great Extent</td>
<td>5</td>
<td>4.50-5.00</td>
</tr>
<tr>
<td>Great Extent</td>
<td>4</td>
<td>3.50-4.49</td>
</tr>
<tr>
<td>Moderate Extent</td>
<td>3</td>
<td>2.50-3.49</td>
</tr>
<tr>
<td>Little Extent</td>
<td>2</td>
<td>1.50-2.49</td>
</tr>
<tr>
<td>Very Little Extent</td>
<td>1</td>
<td>0.50-1.49</td>
</tr>
</tbody>
</table>
CHAPTER FOUR

PRESENTATION AND ANALYSIS OF DATA

This chapter presented and analyzed the data generated for this study.

Research Question 1: To what extent has Students Industrial Work Experience has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production?

The data for answering research question 1 is presented in Table 1 below.

Table 1
Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Enabled Agricultural Education Graduates of Colleges of Education Acquire Agricultural Experiences and Skills Required for Success in Crop Production.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>select suitable soils for different crops.</td>
<td>4.13</td>
<td>0.94</td>
<td>GE</td>
</tr>
<tr>
<td>2</td>
<td>select viable seeds of crops for planting.</td>
<td>4.31</td>
<td>0.76</td>
<td>GE</td>
</tr>
<tr>
<td>3</td>
<td>make ridges, nursery beds and mounds</td>
<td>4.21</td>
<td>0.90</td>
<td>GE</td>
</tr>
<tr>
<td>4</td>
<td>transplant crops to the field.</td>
<td>4.22</td>
<td>0.81</td>
<td>GE</td>
</tr>
<tr>
<td>5</td>
<td>carry out planting operation of crops.</td>
<td>4.34</td>
<td>0.83</td>
<td>GE</td>
</tr>
<tr>
<td>6</td>
<td>identify crop diseases.</td>
<td>3.91</td>
<td>1.04</td>
<td>GE</td>
</tr>
<tr>
<td>7</td>
<td>identify crop pests.</td>
<td>4.05</td>
<td>0.90</td>
<td>GE</td>
</tr>
<tr>
<td>8</td>
<td>control crop diseases using appropriate chemical.</td>
<td>3.60</td>
<td>1.31</td>
<td>GE</td>
</tr>
<tr>
<td>9</td>
<td>mix agrochemicals well.</td>
<td>3.35</td>
<td>1.22</td>
<td>ME</td>
</tr>
<tr>
<td>10</td>
<td>spray agrochemicals in the farm noting the direction of the wind</td>
<td>3.45</td>
<td>1.26</td>
<td>ME</td>
</tr>
<tr>
<td>11</td>
<td>identify appropriate fertilizers required by crops.</td>
<td>4.14</td>
<td>0.85</td>
<td>GE</td>
</tr>
<tr>
<td>12</td>
<td>apply appropriate fertilizers at the right time</td>
<td>4.06</td>
<td>1.05</td>
<td>GE</td>
</tr>
<tr>
<td>13</td>
<td>carry out weeding operation in farm</td>
<td>4.30</td>
<td>0.89</td>
<td>GE</td>
</tr>
<tr>
<td>14</td>
<td>stake weak stemmed crops to avoid creeping on the soil surface</td>
<td>4.16</td>
<td>0.91</td>
<td>GE</td>
</tr>
</tbody>
</table>
Note: $\bar{X}$ = Mean, SD = Standard Deviation, GE = Great Extent, ME = Moderate Extent.

The data presented in Table 1 above showed that items 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, and 14 had their Means between 3.60 and 4.34. This signified that SIWES has enabled Agricultural Education graduates of Colleges of Education the ability to: select suitable soils, select viable seeds of crops, make ridges, nursery beds and moulds, transplant crops, carry out planting operation of crops, identify crop diseases, identify crop pests, among others to a great extent in crop production. Similarly, items 9 and 10 had their Means at 3.35 and 3.45 respectively. This shows that SIWES has enabled Agricultural Education graduates of Colleges of Education the ability to mix agrochemicals well and spray them to a moderate extent.

**Hypotheses 1**

There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production.

The data for testing hypothesis 1 is presented in Table 2 below
Table 2

t-test Analysis of the Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Enabled Agricultural Education Graduates of Colleges of Education Acquire Agricultural Experiences and Skills Required for Success in Crop Production.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>Sec Sch Agric Heads</th>
<th>Managers of Agric Industries</th>
<th>t-cal</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean1 (X1)</td>
<td>Mean2 (X2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD1</td>
<td>SD2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>select suitable soils for different crops.</td>
<td>3.71</td>
<td>4.55</td>
<td>-3.16</td>
<td>NS</td>
</tr>
<tr>
<td>2</td>
<td>select viable seeds of crops for planting.</td>
<td>4.18</td>
<td>4.55</td>
<td>-1.69</td>
<td>NS</td>
</tr>
<tr>
<td>3</td>
<td>make ridges, nursery beds and mounds</td>
<td>4.11</td>
<td>4.30</td>
<td>-0.70</td>
<td>NS</td>
</tr>
<tr>
<td>4</td>
<td>transplant crops to the field.</td>
<td>4.08</td>
<td>4.35</td>
<td>-1.11</td>
<td>NS</td>
</tr>
<tr>
<td>5</td>
<td>carry out planting operation of crops.</td>
<td>4.13</td>
<td>4.55</td>
<td>-1.71</td>
<td>NS</td>
</tr>
<tr>
<td>6</td>
<td>identify crop diseases.</td>
<td>3.67</td>
<td>4.15</td>
<td>-1.77</td>
<td>NS</td>
</tr>
<tr>
<td>7</td>
<td>identify crop pests.</td>
<td>3.85</td>
<td>4.25</td>
<td>-1.79</td>
<td>NS</td>
</tr>
<tr>
<td>8</td>
<td>control crop diseases using appropriate chemical.</td>
<td>3.54</td>
<td>3.65</td>
<td>-0.35</td>
<td>NS</td>
</tr>
<tr>
<td>9</td>
<td>mix agrochemicals well.</td>
<td>2.94</td>
<td>3.75</td>
<td>-2.74</td>
<td>NS</td>
</tr>
<tr>
<td>10</td>
<td>spray agrochemicals in the farm noting the direction of the wind.</td>
<td>3.14</td>
<td>3.75</td>
<td>-1.92</td>
<td>NS</td>
</tr>
<tr>
<td>11</td>
<td>identify appropriate fertilizers required by crops.</td>
<td>3.93</td>
<td>4.35</td>
<td>-1.73</td>
<td>NS</td>
</tr>
<tr>
<td>12</td>
<td>apply appropriate fertilizers at the right time</td>
<td>4.01</td>
<td>4.10</td>
<td>-0.32</td>
<td>NS</td>
</tr>
<tr>
<td>13</td>
<td>carry out weeding operation in farm</td>
<td>4.00</td>
<td>4.60</td>
<td>-2.20</td>
<td>NS</td>
</tr>
<tr>
<td>14</td>
<td>stake weak stemmed crops to avoid creeping on the soil surface</td>
<td>3.82</td>
<td>4.50</td>
<td>-2.56</td>
<td>NS</td>
</tr>
</tbody>
</table>

NOTE: \( \bar{X}_1 = \text{Mean1, SD1 = Standard Deviation 1, } \bar{X}_2 = \text{Mean2, SD2 = Standard Deviation 2, } t-cal = t-calculated, \text{NS = Not Significant, N1= Number of Secondary School Agric Science Heads(201), N2= Number of Managers of Agric Industries(39), t-table = 1.96} \)

The data presented in Table 2 above indicated that all the items had their t-calculated less than t-table of 1.96 at 0.05 level of significance and 238 degrees of freedom. This signified that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and...
Managers of Agricultural Industries on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production. Consequently, the hypothesis of no significant difference was upheld. Therefore, the two group of respondents accepted that SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for crop production.

**Research Question 2**: To what extent has SIWES equipped NCE Agricultural Education Students for working in livestock enterprise after graduation?

The data for answering research question 2 is presented in Table 3 below.
Table 3
Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Equipped NCE Agricultural Education Students for Working in Livestock Enterprise After Graduation.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>Mean (X)</th>
<th>Standard Deviation (SD)</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brood chicks conveniently.</td>
<td>4.17</td>
<td>0.99</td>
<td>GE</td>
</tr>
<tr>
<td>2</td>
<td>feed livestock with the right feed at the right time</td>
<td>4.47</td>
<td>0.64</td>
<td>GE</td>
</tr>
<tr>
<td>3</td>
<td>prepare and disinfect pens</td>
<td>3.70</td>
<td>1.09</td>
<td>GE</td>
</tr>
<tr>
<td>4</td>
<td>spread the litter materials in pens at the appropriate time</td>
<td>4.45</td>
<td>0.77</td>
<td>GE</td>
</tr>
<tr>
<td>5</td>
<td>predict oestrus in farm animals</td>
<td>3.27</td>
<td>1.17</td>
<td>ME</td>
</tr>
<tr>
<td>6</td>
<td>carry out animal dip in to control ectoparasite</td>
<td>3.70</td>
<td>0.99</td>
<td>GE</td>
</tr>
<tr>
<td>7</td>
<td>deworm farm animal at the right time with the correct dewormer</td>
<td>3.71</td>
<td>0.93</td>
<td>GE</td>
</tr>
<tr>
<td>8</td>
<td>carry out routine vaccination in farm animals</td>
<td>3.58</td>
<td>1.08</td>
<td>GE</td>
</tr>
<tr>
<td>9</td>
<td>ferment silage for feeding farm animals at the period of scarcity of feed</td>
<td>2.86</td>
<td>1.22</td>
<td>ME</td>
</tr>
<tr>
<td>10</td>
<td>detect sick livestock from the group</td>
<td>4.18</td>
<td>0.96</td>
<td>GE</td>
</tr>
<tr>
<td>11</td>
<td>cull diseased farm animal</td>
<td>3.96</td>
<td>1.14</td>
<td>GE</td>
</tr>
<tr>
<td>12</td>
<td>treat the sick animal</td>
<td>3.09</td>
<td>1.31</td>
<td>ME</td>
</tr>
<tr>
<td>13</td>
<td>provide adequate ventilation in farm animal pens.</td>
<td>4.18</td>
<td>0.96</td>
<td>GE</td>
</tr>
<tr>
<td>14</td>
<td>debeak poultry to avoid cannibalism and pecking</td>
<td>3.25</td>
<td>1.18</td>
<td>ME</td>
</tr>
<tr>
<td>15</td>
<td>brand farm animals for identification</td>
<td>2.97</td>
<td>1.38</td>
<td>ME</td>
</tr>
<tr>
<td>16</td>
<td>dehorn farm animals correctly to reduce fighting.</td>
<td>2.78</td>
<td>0.24</td>
<td>ME</td>
</tr>
<tr>
<td>17</td>
<td>castrate male livestock at the appropriate time</td>
<td>2.32</td>
<td>1.18</td>
<td>LE</td>
</tr>
<tr>
<td>18</td>
<td>extract milk from livestock</td>
<td>2.29</td>
<td>1.21</td>
<td>LE</td>
</tr>
<tr>
<td>19</td>
<td>formulate feed of different types</td>
<td>2.51</td>
<td>1.18</td>
<td>ME</td>
</tr>
<tr>
<td>20</td>
<td>fatten livestock for sale</td>
<td>2.62</td>
<td>0.16</td>
<td>ME</td>
</tr>
</tbody>
</table>

Note: $\overline{X}$ = mean, SD = Standard Deviation, GE=Great Extent, ME=Moderate Extent, LE=Little Extent.

The data presented in Table 3 above indicated that items 1,2,3,4,6,7,8,10,11 and 13 had their Means between 3.58 and 4.47. This implied that SIWES has equipped Agricultural Education students of Colleges of Education with the ability to: brood chicks, feed livestock, prepare and disinfect pens, spread litter materials in pens, carry out animal dip, deworm farm animals, carry out vaccination, detect sick
animals, cull diseased farm animals and ventilate animal pens to a great extent for working in livestock enterprise after graduation. The Table also revealed that items 5, 9, 12, 14, 15, 16, 19 and 20 had their Mean scores ranging from 2.51 to 3.27. This also implied that the programme has equipped Agricultural Education students of Colleges of Education with the ability to: predict oestrus in farm animals, ferment silage for feeding farm animals, treat sick animals, debeak poultry, brand farm animals, deworm farm animals, formulate different animal feeds and fatten livestock to a moderate extent for working in livestock enterprise after graduation. Similarly, items 17 and 18 had their Means at 2.32 and 2.29 respectively. This indicated that SIWES has equipped Agricultural Education graduates of Colleges of Education with the ability to castrate male livestock and extract milk from livestock to a little extent.

**Hypothesis 2**

There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has equipped agricultural education students for working in livestock enterprises after graduation.

The data for testing hypothesis 2 is presented in Table 4 below.
Table 4

*t*-test Analysis of the Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Equipped Agricultural Education Students for Working in Livestock Enterprises After Graduation.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>Sec Sch Agric Heads</th>
<th>Managers of Agric Ind</th>
<th>t-cal</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>brood chicks conveniently.</td>
<td>3.88</td>
<td>4.45</td>
<td>-2.07</td>
<td>NS</td>
</tr>
<tr>
<td>2</td>
<td>feed livestock with the right feed at the right time</td>
<td>4.13</td>
<td>4.80</td>
<td>-3.54</td>
<td>NS</td>
</tr>
<tr>
<td>3</td>
<td>prepare and disinfect pens</td>
<td>3.85</td>
<td>3.55</td>
<td>1.05</td>
<td>NS</td>
</tr>
<tr>
<td>4</td>
<td>spread the litter materials in pens at the appropriate time</td>
<td>4.15</td>
<td>4.75</td>
<td>-2.59</td>
<td>NS</td>
</tr>
<tr>
<td>5</td>
<td>predict oestrus in farm animals</td>
<td>3.49</td>
<td>3.05</td>
<td>1.23</td>
<td>NS</td>
</tr>
<tr>
<td>6</td>
<td>carry out animal dip in to control ectoparasite</td>
<td>3.75</td>
<td>3.65</td>
<td>0.81</td>
<td>NS</td>
</tr>
<tr>
<td>7</td>
<td>deworm farm animal at the right time with the correct dewormer</td>
<td>3.67</td>
<td>3.75</td>
<td>0.72</td>
<td>NS</td>
</tr>
<tr>
<td>8</td>
<td>carry out routine vaccination in farm animals</td>
<td>3.75</td>
<td>3.40</td>
<td>1.05</td>
<td>NS</td>
</tr>
<tr>
<td>9</td>
<td>ferment silage for feeding farm animals at the period of scarcity of feed</td>
<td>3.01</td>
<td>2.70</td>
<td>1.26</td>
<td>NS</td>
</tr>
<tr>
<td>10</td>
<td>detect sick livestock from the group</td>
<td>4.00</td>
<td>4.35</td>
<td>0.93</td>
<td>NS</td>
</tr>
<tr>
<td>11</td>
<td>cull diseased farm animal</td>
<td>3.97</td>
<td>3.95</td>
<td>1.19</td>
<td>NS</td>
</tr>
<tr>
<td>12</td>
<td>treat the sick animal</td>
<td>3.43</td>
<td>2.75</td>
<td>1.37</td>
<td>NS</td>
</tr>
<tr>
<td>13</td>
<td>provide adequate ventilation in farm animal pens.</td>
<td>4.01</td>
<td>3.45</td>
<td>0.99</td>
<td>NS</td>
</tr>
<tr>
<td>14</td>
<td>debeak poultry to avoid cannibalism and pecking</td>
<td>3.49</td>
<td>3.00</td>
<td>1.21</td>
<td>NS</td>
</tr>
<tr>
<td>15</td>
<td>brand farm animals for identification</td>
<td>3.24</td>
<td>2.70</td>
<td>1.49</td>
<td>NS</td>
</tr>
<tr>
<td>16</td>
<td>dehorn farm animals correctly to reduce fighting.</td>
<td>2.90</td>
<td>2.65</td>
<td>1.46</td>
<td>NS</td>
</tr>
<tr>
<td>17</td>
<td>castrate male livestock at the appropriate time</td>
<td>2.89</td>
<td>1.75</td>
<td>1.12</td>
<td>NS</td>
</tr>
<tr>
<td>18</td>
<td>extract milk from livestock</td>
<td>2.82</td>
<td>1.75</td>
<td>1.12</td>
<td>NS</td>
</tr>
<tr>
<td>19</td>
<td>formulate feed of different types</td>
<td>3.22</td>
<td>1.80</td>
<td>1.22</td>
<td>NS</td>
</tr>
<tr>
<td>20</td>
<td>fatten livestock for sale</td>
<td>3.69</td>
<td>1.55</td>
<td>0.89</td>
<td>NS</td>
</tr>
</tbody>
</table>

NOTE: $\bar{X}_1 =$ Mean1, SD1 = Standard Deviation 1, $\bar{X}_2 =$ Mean2, SD2 = Standard Deviation 2, t-cal = t-calculated, NS= Not Significant, N1= Number of Secondary School Agric Science Heads(201), N2= Number of Managers of Agric Industries(39), t-table = 1.96

The data presented in Table 4 also revealed that all the items had their t-calculated less than t-table of 1.96 at 0.05 level of significance and 238 degrees of freedom. This showed that there was no significant difference in the Mean responses of the respondents on the extent SIWES has equipped
Agricultural Education graduates for working in livestock enterprises. Therefore, the hypothesis of no significant difference was upheld. Hence, Secondary School Agricultural Science Heads and Managers of Agricultural Industries unanimously accepted that SIWES has equipped Agricultural Education graduates for working in livestock enterprises.

**Research Question 3:** To what extent has SIWES exposed NCE Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production?

Table 5 below presented the data for answering research question 3.

**Table 5**  
 Mean Responses of the Respondents on the Extent SIWES has Exposed NCE Agricultural Education Graduates in Handling Agricultural Equipment and Machines that are Necessary for Carrying out Agricultural Production.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>( \bar{X} )</th>
<th>SD</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>couple plough to tractor.</td>
<td>2.07</td>
<td>0.90</td>
<td>LE</td>
</tr>
<tr>
<td>2</td>
<td>drive and work with tractor in the farm.</td>
<td>1.96</td>
<td>0.91</td>
<td>LE</td>
</tr>
<tr>
<td>3</td>
<td>use knapsack sprayer to spray agrochemicals.</td>
<td>2.57</td>
<td>1.02</td>
<td>ME</td>
</tr>
<tr>
<td>4</td>
<td>use milking machine to extract milk from cow.</td>
<td>2.05</td>
<td>0.84</td>
<td>LE</td>
</tr>
<tr>
<td>5</td>
<td>cultivate the soil with ridger.</td>
<td>2.20</td>
<td>0.97</td>
<td>LE</td>
</tr>
<tr>
<td>6</td>
<td>spray insecticide on trees using mist blower.</td>
<td>2.17</td>
<td>1.02</td>
<td>LE</td>
</tr>
<tr>
<td>7</td>
<td>work with planters in the farm</td>
<td>2.30</td>
<td>1.08</td>
<td>LE</td>
</tr>
<tr>
<td>8</td>
<td>trim flowers using shears.</td>
<td>2.59</td>
<td>1.11</td>
<td>ME</td>
</tr>
<tr>
<td>9</td>
<td>harvest crops using harvester</td>
<td>1.98</td>
<td>0.88</td>
<td>LE</td>
</tr>
<tr>
<td>10</td>
<td>harvest forages using mower.</td>
<td>2.03</td>
<td>0.85</td>
<td>LE</td>
</tr>
<tr>
<td>11</td>
<td>use prismatic compass in taking bearing.</td>
<td>1.91</td>
<td>0.90</td>
<td>LE</td>
</tr>
<tr>
<td>12</td>
<td>handling theodolite to measure horizontal and vertical angles</td>
<td>2.00</td>
<td>0.91</td>
<td>LE</td>
</tr>
<tr>
<td>13</td>
<td>store agricultural tools well after use.</td>
<td>3.10</td>
<td>1.30</td>
<td>ME</td>
</tr>
<tr>
<td>14</td>
<td>maintain the equipment and machines to prevent damage.</td>
<td>2.72</td>
<td>1.06</td>
<td>ME</td>
</tr>
<tr>
<td>15</td>
<td>handle incubator for incubating eggs.</td>
<td>2.06</td>
<td>0.86</td>
<td>LE</td>
</tr>
</tbody>
</table>

Note: \( \bar{X} = \text{Mean}, \ SD = \text{Standard Deviation}, \ LE = \text{Little Extent}, \ ME = \text{Moderate Extent} \).

The data presented in Table 5 revealed that items 1, 2, 4, 5, 6, 7, 9, 10, 11, 12 and 15 had their Mean scores ranging from 1.91 to 2.30. This signified that SIWES has exposed Agricultural Education graduates of Colleges of
Education with the ability to: couple plough to tractor, drive and work with tractor, use milking machine to extract milk, cultivate the soil with ridger, spray insecticide on trees using mist blower, work with planters, harvest crops using harvester, harvest forages using mower, use prismatic compass in taking bearing, handling theodolite in measuring angles and handle incubator for incubating eggs to a little extent in handling agricultural equipment and machines. The Table also showed that items 3, 8, 13 and 14 had their Mean scores ranging from 2.57 to 3.10. This as well signified that SIWES has exposed Agricultural Education graduates with the ability to: use knapsack sprayer, trim flowers using shears, store agricultural tools well and maintain equipment and machines to a moderate extent.

**Hypothesis 3**

There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has exposed agricultural education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production.

Table 6 below presented the data for testing hypothesis 3.
As shown in Table 6 above, the t-calculated for all the items were greater than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom. This indicated that there was a significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production. Consequently, the hypothesis of no significant difference was rejected. Therefore, the respondents agreed that SIWES has not exposed Agricultural Education graduates of Colleges of Education in handling agricultural equipment and machines that are necessary for carrying out agricultural production.
equipment and machines that are necessary for carrying out agricultural production.

**Research Question 4:** To what extent has SIWES enhanced NCE Agricultural Education graduates transition from school to agricultural processing enterprise?

The data for answering research question 4 is presented in Table 7 below.

**Table 7**

<table>
<thead>
<tr>
<th>Item Statements</th>
<th>$\bar{X}$</th>
<th>SD</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>peel cassava tubers</td>
<td>4.87</td>
<td>0.33</td>
<td>VGE</td>
</tr>
<tr>
<td>process fresh cassava to cassava chips</td>
<td>4.58</td>
<td>0.52</td>
<td>VGE</td>
</tr>
<tr>
<td>prepare cassava flour</td>
<td>4.78</td>
<td>0.42</td>
<td>VGE</td>
</tr>
<tr>
<td>make garri from cassava tubers</td>
<td>4.69</td>
<td>0.50</td>
<td>VGE</td>
</tr>
<tr>
<td>prepare yam flour</td>
<td>4.65</td>
<td>0.50</td>
<td>VGE</td>
</tr>
<tr>
<td>make yam chips</td>
<td>4.62</td>
<td>0.55</td>
<td>VGE</td>
</tr>
<tr>
<td>make pulp from maize</td>
<td>4.64</td>
<td>0.53</td>
<td>VGE</td>
</tr>
<tr>
<td>process maize flour</td>
<td>4.86</td>
<td>0.32</td>
<td>VGE</td>
</tr>
<tr>
<td>make bean cake</td>
<td>4.74</td>
<td>0.48</td>
<td>VGE</td>
</tr>
<tr>
<td>process palm oil for domestic and industrial use</td>
<td>3.88</td>
<td>1.07</td>
<td>GE</td>
</tr>
<tr>
<td>extract palm kernel oil from palm kernel</td>
<td>3.51</td>
<td>1.23</td>
<td>GE</td>
</tr>
<tr>
<td>extract groundnut oil for domestic and industrial use</td>
<td>3.30</td>
<td>1.25</td>
<td>ME</td>
</tr>
<tr>
<td>pasteurize fresh milk extracted from cow</td>
<td>2.74</td>
<td>1.18</td>
<td>ME</td>
</tr>
<tr>
<td>homogenize milk</td>
<td>2.61</td>
<td>1.23</td>
<td>ME</td>
</tr>
<tr>
<td>carry out creaming of milk.</td>
<td>2.20</td>
<td>1.19</td>
<td>LE</td>
</tr>
<tr>
<td>prepare cheese from milk and other ingredients</td>
<td>2.47</td>
<td>1.24</td>
<td>LE</td>
</tr>
<tr>
<td>prepare butter</td>
<td>2.28</td>
<td>1.08</td>
<td>LE</td>
</tr>
<tr>
<td>prepare sausages from fresh meat</td>
<td>2.54</td>
<td>1.12</td>
<td>ME</td>
</tr>
</tbody>
</table>

Note: $\bar{X}$ = Mean, SD = Standard Deviation, VGE = Very Great Extent, GE = Great Extent, ME = Moderate Extent, LE = Little Extent
The data presented in Table 7 above revealed that items 1, 2, 3, 4, 5, 6, 7, 8 and 9 had their Mean scores at 4.58 and 4.87. This indicated that SIWES has enabled Agricultural Education graduates of Colleges of Education the ability to peel cassava tubers, process cassava chips, prepare cassava flour, make garri, prepare yam flour, make yam chips, make maize pulp, process maize flour and make bean cake to a very great extent. Similarly, the data in Table 4 showed that items 10 and 11 had their Mean scores at 3.88 and 3.51 respectively. This implied that the programme has enhanced agricultural education graduate the ability to: process palm oil and extract palm kernel oil to a great extent. The data also showed that items 12, 13, 14 and 18 had their Mean scores ranging from 2.54 to 3.30. This also showed that the programme has enhanced Agricultural Education graduates the ability to extract groundnut oil, pasteurize fresh milk, homogenize milk and prepare sausages to a moderate extent. Items 15, 16, and 17 had their Means between 2.20 and 2.47 which signified that SIWES has enhanced agricultural education graduates the ability to: cream milk, prepare cheese and butter to a little extent.

**Hypothesis 4**

There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries
on the extent SIWES has enhanced the transition of Agricultural Education graduates from school to agricultural processing enterprises.

Table 8 below presented the data for testing hypothesis 4.

Table 8
\( t \)-test Analysis of the Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Enhanced the Transition of Agricultural Education Graduates from School to Agricultural Processing Enterprises.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>Sec Sch Agric Heads ( \bar{X}_1 )</th>
<th>SD1</th>
<th>Managers of Agric Industries ( \bar{X}_2 )</th>
<th>SD2</th>
<th>t-cal</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>peel cassava tubers</td>
<td>4.79</td>
<td>0.44</td>
<td>4.95</td>
<td>0.22</td>
<td>-1.54</td>
<td>NS</td>
</tr>
<tr>
<td>2</td>
<td>process fresh cassava to cassava chips</td>
<td>4.51</td>
<td>0.56</td>
<td>4.65</td>
<td>0.49</td>
<td>-0.99</td>
<td>NS</td>
</tr>
<tr>
<td>3</td>
<td>prepare cassava flour</td>
<td>4.75</td>
<td>0.44</td>
<td>4.80</td>
<td>0.41</td>
<td>-0.46</td>
<td>NS</td>
</tr>
<tr>
<td>4</td>
<td>make garri from cassava tubers</td>
<td>4.58</td>
<td>0.60</td>
<td>4.80</td>
<td>0.41</td>
<td>-1.52</td>
<td>NS</td>
</tr>
<tr>
<td>5</td>
<td>prepare yam flour</td>
<td>4.54</td>
<td>0.56</td>
<td>4.75</td>
<td>0.44</td>
<td>-1.55</td>
<td>NS</td>
</tr>
<tr>
<td>6</td>
<td>make yam chips</td>
<td>4.54</td>
<td>0.63</td>
<td>4.70</td>
<td>0.47</td>
<td>-1.05</td>
<td>NS</td>
</tr>
<tr>
<td>7</td>
<td>make pulp from maize</td>
<td>4.68</td>
<td>0.55</td>
<td>4.60</td>
<td>0.50</td>
<td>0.59</td>
<td>NS</td>
</tr>
<tr>
<td>8</td>
<td>process maize flour</td>
<td>4.78</td>
<td>0.42</td>
<td>4.95</td>
<td>0.22</td>
<td>-1.77</td>
<td>NS</td>
</tr>
<tr>
<td>9</td>
<td>make bean cake</td>
<td>4.63</td>
<td>0.59</td>
<td>4.85</td>
<td>0.37</td>
<td>-1.52</td>
<td>NS</td>
</tr>
<tr>
<td>10</td>
<td>process palm oil for domestic and industrial use</td>
<td>3.96</td>
<td>1.13</td>
<td>3.80</td>
<td>1.01</td>
<td>0.57</td>
<td>NS</td>
</tr>
<tr>
<td>11</td>
<td>extract palm kernel oil from palm kernel</td>
<td>3.67</td>
<td>1.33</td>
<td>3.35</td>
<td>1.14</td>
<td>0.97</td>
<td>NS</td>
</tr>
<tr>
<td>12</td>
<td>extract groundnut oil for domestic and industrial use</td>
<td>3.19</td>
<td>1.35</td>
<td>3.40</td>
<td>1.14</td>
<td>-0.62</td>
<td>NS</td>
</tr>
<tr>
<td>13</td>
<td>pasteurize fresh milk extracted from cow</td>
<td>3.22</td>
<td>1.46</td>
<td>2.25</td>
<td>1.91</td>
<td>2.83</td>
<td>S</td>
</tr>
<tr>
<td>14</td>
<td>homogenize milk</td>
<td>3.11</td>
<td>1.53</td>
<td>2.10</td>
<td>0.97</td>
<td>2.79</td>
<td>S</td>
</tr>
<tr>
<td>15</td>
<td>carry out creaming of milk.</td>
<td>2.56</td>
<td>1.38</td>
<td>1.85</td>
<td>0.99</td>
<td>2.13</td>
<td>S</td>
</tr>
<tr>
<td>16</td>
<td>prepare cheese from milk and other ingredients</td>
<td>2.89</td>
<td>1.53</td>
<td>2.05</td>
<td>0.94</td>
<td>2.32</td>
<td>S</td>
</tr>
<tr>
<td>17</td>
<td>prepare butter</td>
<td>2.65</td>
<td>1.31</td>
<td>1.90</td>
<td>0.85</td>
<td>2.42</td>
<td>S</td>
</tr>
<tr>
<td>18</td>
<td>prepare sausages from fresh meat</td>
<td>2.93</td>
<td>1.44</td>
<td>2.15</td>
<td>0.81</td>
<td>2.32</td>
<td>S</td>
</tr>
</tbody>
</table>

NOTE: \( \bar{X}_1 \) = Mean1, SD1 = Standard Deviation 1, \( \bar{X}_2 \) = Mean2, SD2 = Standard Deviation 2, t-cal = t-calculated, NS= Not Significant, N1= Number of Secondary School Agric Science Heads(201), N2= Number of Managers of Agric Industries(39), t-table = 1.96

Data presented in Table 8 revealed that items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 had their t-calculated less than t-table value of 1.96 at 0.05 level of
significance and 238 degrees of freedom. This showed that the hypothesis of no significant difference was upheld for the items. The Table also indicated that items 13, 14, 15, 16, 17 and 18 had their t-calculated greater than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom. This also shows that hypothesis of no significant difference was rejected for the items. The t-calculated for the whole items was 0.33 which is less than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom. This implied that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has enhanced the transition of Agricultural Education graduates from school to Agricultural processing enterprises. Hence, the null hypothesis (HO₄) that there is no significant difference was upheld. Therefore, the respondents agreed that SIWES has enhanced the transition of Agricultural Education graduates from school to Agricultural Processing Industries.

**Research Question 5:** To what extent has SIWES afforded NCE Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry?

The data in Table 9 below is presented for answering research question 5.
Table 9
Mean Responses of the Respondents on the Extent SIWES has Afforded NCE Agricultural Education Graduates the Opportunity of Applying the Knowledge Gained in Theoretical Work into Practical Work in Forestry Industry.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>X</th>
<th>SD</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>select viable seeds of trees for planting</td>
<td>4.63</td>
<td>0.55</td>
<td>VGE</td>
</tr>
<tr>
<td>2</td>
<td>prepare nursery pots with appropriate soil mixture.</td>
<td>3.99</td>
<td>1.06</td>
<td>GE</td>
</tr>
<tr>
<td>3</td>
<td>carry out nursery operations</td>
<td>4.11</td>
<td>1.05</td>
<td>GE</td>
</tr>
<tr>
<td>4</td>
<td>carry out transplanting of seedlings to the permanent site successfully</td>
<td>4.18</td>
<td>0.82</td>
<td>GE</td>
</tr>
<tr>
<td>5</td>
<td>integrate annual crops with young trees</td>
<td>4.53</td>
<td>0.56</td>
<td>VGE</td>
</tr>
<tr>
<td>6</td>
<td>weed the plantation to avoid competition</td>
<td>4.24</td>
<td>0.79</td>
<td>GE</td>
</tr>
<tr>
<td>7</td>
<td>apply appropriate fertilizer at the appropriate time in the plantation</td>
<td>4.04</td>
<td>1.02</td>
<td>GE</td>
</tr>
<tr>
<td>8</td>
<td>prune the tree branches for upward growth</td>
<td>4.25</td>
<td>0.70</td>
<td>GE</td>
</tr>
<tr>
<td>9</td>
<td>carry out fire tracing of the forest to avoid bush burning.</td>
<td>4.25</td>
<td>0.70</td>
<td>GE</td>
</tr>
<tr>
<td>10</td>
<td>beat up the dead stands to make a good plantation.</td>
<td>3.33</td>
<td>1.19</td>
<td>ME</td>
</tr>
<tr>
<td>11</td>
<td>carry out budding successfully in seedlings</td>
<td>2.03</td>
<td>0.91</td>
<td>LE</td>
</tr>
<tr>
<td>12</td>
<td>carry out grafting in seedlings.</td>
<td>2.08</td>
<td>0.84</td>
<td>LE</td>
</tr>
<tr>
<td>13</td>
<td>replace the harvested stand with desired specie.</td>
<td>3.14</td>
<td>1.25</td>
<td>ME</td>
</tr>
</tbody>
</table>

Note: \( \bar{X} = \text{Mean}, \ SD = \text{Standard Deviation}, \ VGE = \text{Very Great Extent}, \ GE = \text{Great Extent}, \ ME = \text{Moderate Extent}, \ LE = \text{Little Extent} \)

The data presented in Table 9 above indicated that items 1 and 5 had their Mean scores at 4.63 and 4.53 respectively. This indicated that SIWES has afforded Agricultural Education graduates the ability to select viable seeds of trees and integrate annual crops with young trees to a very great extent.

The table also revealed that items 2, 3, 4, 6, 7, 8 and 9 had their Mean scores ranging from 3.99 to 4.25. This indicated that SIWES has afforded Agricultural Education graduates the ability to: prepare nursery pots, carry
out nursery operations, transplant seedlings, weed plantation, apply appropriate fertilizer, prune tree branches and fire trace forest to a great extent. The Table further revealed that items 10 and 13 had their Mean scores at 3.33 and 3.14 respectively which also showed that the programme has afforded Agricultural Education graduates the ability to beat up dead stands and replace harvested stands with desired specie to a moderate extent. The Table as well showed that items 11 and 12 had their Mean scores at 2.03 and 2.08 which shows that SIWES has afforded Agricultural Education graduates the ability to bud and graft seedlings to a little extent.

**Hypothesis 5**

There is no significant difference in the mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.
The data in Table 10 below is presented for testing hypothesis 5.

Table 10

t-test Analysis of the Mean Responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the Extent SIWES has Afforded Agricultural Education Graduates the Opportunity of Applying the Knowledge Gained in Theoretical Work into Practical Work in Forestry Industry.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>Sec Sch Agric Science Heads</th>
<th>Managers of Agric Industries</th>
<th>t-cal</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>( \bar{X}_1 )</td>
<td>SD1</td>
<td>( \bar{X}_2 )</td>
<td>SD2</td>
</tr>
<tr>
<td>1</td>
<td>select viable seeds of trees for planting</td>
<td>4.63</td>
<td>0.57</td>
<td>4.80</td>
<td>0.52</td>
</tr>
<tr>
<td>2</td>
<td>prepare nursery pots with appropriate soil mixture.</td>
<td>3.99</td>
<td>1.07</td>
<td>4.05</td>
<td>1.05</td>
</tr>
<tr>
<td>3</td>
<td>carry out nursery operations</td>
<td>4.11</td>
<td>1.01</td>
<td>4.00</td>
<td>1.08</td>
</tr>
<tr>
<td>4</td>
<td>carry out transplanting of seedlings to the permanent site successfully</td>
<td>4.18</td>
<td>0.95</td>
<td>4.60</td>
<td>0.68</td>
</tr>
<tr>
<td>5</td>
<td>integrate annual crops with young trees</td>
<td>4.53</td>
<td>0.63</td>
<td>4.65</td>
<td>0.49</td>
</tr>
<tr>
<td>6</td>
<td>weed the plantation to avoid competition</td>
<td>4.24</td>
<td>1.00</td>
<td>4.65</td>
<td>0.59</td>
</tr>
<tr>
<td>7</td>
<td>apply appropriate fertilizer at the appropriate time in the plantation</td>
<td>4.04</td>
<td>1.08</td>
<td>4.20</td>
<td>0.95</td>
</tr>
<tr>
<td>8</td>
<td>prune the tree branches for upward growth</td>
<td>4.25</td>
<td>0.82</td>
<td>4.35</td>
<td>0.59</td>
</tr>
<tr>
<td>9</td>
<td>carry out fire tracing of the forest to avoid bush burning.</td>
<td>4.25</td>
<td>0.80</td>
<td>4.40</td>
<td>0.60</td>
</tr>
<tr>
<td>10</td>
<td>beat up the dead stands to make a good plantation.</td>
<td>3.33</td>
<td>1.24</td>
<td>3.65</td>
<td>1.14</td>
</tr>
<tr>
<td>11</td>
<td>carry out budding successfully in seedlings.</td>
<td>2.03</td>
<td>0.89</td>
<td>2.85</td>
<td>0.93</td>
</tr>
<tr>
<td>12</td>
<td>carry out grafting in seedlings.</td>
<td>2.08</td>
<td>0.92</td>
<td>2.80</td>
<td>0.77</td>
</tr>
<tr>
<td>13</td>
<td>replace the harvested stand with desired specie.</td>
<td>3.14</td>
<td>1.30</td>
<td>2.80</td>
<td>1.20</td>
</tr>
</tbody>
</table>

NOTE: \( \bar{X}_1 = \text{Mean1, } SD1 = \text{Standard Deviation 1, } \bar{X}_2 = \text{Mean2, } SD2 = \text{Standard Deviation 2, t-cal = t-calculated, NS= Not Significant, N1= Number of Secondary School Agric Science Heads(201), N2= Number of Managers of Agric Industries(39), t-table = 1.96} 

The data presented in Table 10 above revealed that all the items had their t-calculated value was less than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom. This signified that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has afforded Agricultural Education graduates the opportunity
of applying the knowledge gained in theoretical work into practical work in forestry industry. Hence, the null hypothesis (\(HO_5\)) that there is no significant difference was upheld. Therefore, the respondents accepted that SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

**Findings of the Study**

Based on data collected, analyzed and interpreted, the following findings were made:

1. The respondents accepted that SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production to a great extent in the following ways: select suitable soils for different crops, select viable seeds of crops for planting, make ridges, nursery beds and mounds, transplant crops to the field, carry out planting operations of crops, identify crop diseases, identify crop pests, control crop diseases using appropriate chemicals, identify appropriate fertilizers required for crops, apply appropriate fertilizers at the right time, carry out weeding operation in farm and stake weak stemmed crops to avoid creeping on the soil surface.
Similarly, the respondents agreed that SIWES has enabled the graduates acquire agricultural experiences and skills in crop production to a moderate extent in the following ways: mix agrochemicals well and spray agrochemicals in the farm noting the direction on the wind.

It was also found that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills required for success in crop production.

2. The respondents accepted the following items as the ways SIWES has equipped Agricultural Education students for working in livestock enterprise after graduation to a great extent. They include: brood chicks conveniently, feed livestock with the right feed at the right time, prepare and disinfect pens, spread the litter materials in pens at the appropriate time, carry out animal dip to control ectoparasite, deworm farm animal at the right time with the correct dewormer, carry out routine vaccination in farm animals, detect sick livestock from the group, cull diseased farm animal and provide adequate ventilation in farm animal pens.

Similarly the respondents agreed that the following items are the ways SIWES has equipped Agricultural Education graduates for working in
livestock enterprises to a moderate extent. They include: predict oestrus in farm animals, ferment silage for feeding farm animals at the period of scarcity of feed, treat the sick animal, debeak poultry to avoid cannibalism and pecking, brand farm animals for identification, dehorn farm animal correctly to reduce fighting, formulate feed of different types and fatten livestock for sale.

However, the respondents agreed that the following items are the ways SIWES has equipped Agricultural Education graduates for working in livestock enterprises to a little extent. They include: castrate male livestock at the appropriate time and extract milk from livestock.

It was as well found that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has equipped Agricultural Education students of Colleges of Education for working in livestock enterprise after graduation.

3. The respondents accepted that SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying agricultural production to a moderate extent in the following ways: use knapsack sprayer to spray agrochemicals, trim
flowers using shears, store agricultural tools well after use and maintain the equipment and machines to prevent damage.

The respondents accepted that SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines to a little extent in the following ways: couple plough to tractor, drive and work with tractor in the farm, use milking machine to extract milk from cow, cultivate the soil with ridger, spray insecticide on trees using mist blower, work with planters in the farm, harvest crops using harvester, harvest forages using mower, use prismatic compass in taking bearing, handle theodolite to measure horizontal and vertical angles and handle incubator for incubating eggs. It was found that there was a significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production.

4. The respondents accepted that SIWES has enhanced the transition of Agricultural Education graduates from school to agricultural processing enterprises to a very great extent in the following ways: peel cassava tubers, process fresh cassava to cassava chips, prepare cassava flour, make
garri from cassava tubers, prepare yam flour, make yam chips, make pulp from maize, process maize flour and make bean cake.

The respondents also agreed that the following items are the ways SIWES has enhanced NCE Agricultural Education graduates transition from school to agricultural processing enterprise to a great extent. They include: process palm oil for domestic and industrial use and extract palm kernel oil from palm kernel. Similarly, the respondents accepted that the following items are the ways SIWES has enhanced NCE Agricultural Education graduates transition from school to agricultural processing enterprises to a moderate extent. They include: extract groundnut oil for domestic and industrial use, pasteurize fresh milk extracted from cow, homogenize milk and prepare sausages from fresh meat.

The respondents agreed that SIWES has enhanced Agricultural Education graduates transition from school to agricultural processing enterprises to a little extent in the following ways: carry out creaming of milk, prepare cheese from milk and other ingredients and prepare butter. It was equally found that there was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural industries on the extent SIWES has enhanced the transition
of Agricultural Education graduates from school to agricultural processing enterprises.

5. The respondents agreed that SIWES has afforded NCE Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry to a very great and great extent in the following ways: select viable seeds of trees for planting, integrate annual crops with young trees, prepare nursery pots with appropriate soil mixture, carry out nursery operations, carry out transplanting of seedlings to the permanent site successfully, weed the plantation to avoid competition, apply appropriate fertilizer at the appropriate time in the plantation, prune the tree branches for upward growth and carry out fire tracing of the forest to avoid bush burning.

The respondents also agreed that SIWES has afforded NCE Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry to a moderate and little extent in the following ways: beat up dead stands to make a good plantation, replace the harvested stands with desired specie, carry out budding successfully in seedlings and carry out grafting in seedlings.
The study also was found that there was no significant difference in the Mean responses of the respondents on the extent SIWES has afforded NCE Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

**Discussion of the Findings**

The findings of the study were discussed based on the following subheadings:

1. SIWES and Skill Acquisition in Crop Production.
2. SIWES in Preparation for Working in Livestock Enterprises.
3. SIWES and Techniques of Handling Agricultural Equipment and Machines.
4. SIWES and Transition from School to Agricultural Processing Enterprise.
5. SIWES and Application of Theoretical Knowledge into Practical Work.

1. *SIWES and Skill Acquisition in Crop Production.*

The findings of the study showed that the respondents accepted the following items as the ways SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills in crop production to a great extent. They
include: selection of suitable soils, selection of viable seeds of crops, making of ridges, beds and moulds, transplanting crops, carrying out planting operations, identifying crop diseases, identifying crop pests, controlling crop diseases, among others. This finding was consistent with the opinion of Mafe (2010) who noted that SIWES exposes Agricultural Education students to crop production environment in which they will work in future. The author stated that SIWES enable the students see how their future profession are organized in practice and gives them ample opportunity to manipulate the crops in the field. The finding also agreed with Ugwuanyi (2010) who observed that SIWES prepares Agricultural Education students for crop production occupation. According to the author, the skills acquired by Agricultural Education graduates during SIWES can be perfected when employed in crop production enterprise.

2. **SIWES in Preparation for Working in Livestock Enterprises.**

The findings also indicated that the respondents accepted to a great extent some of the items as the ways SIWES has equipped Agricultural Education graduates of Colleges of Education for working in livestock enterprises. They include: brooding of chicks, feeding livestock with the right feed, preparing and
disinfecting of pens, spreading the litter materials in pens, carrying out animal dip, deworming farm animals, carrying out routine vaccination, detecting sick livestock, culling diseased farm animals and providing adequate ventilation. This finding was in consonance with Ekunke (2008) who noted that SIWES was designed to provide much needed on-the-job practical experience for Agricultural Education students who wished to acquire the relevant skills in livestock and other agricultural productions. The author noted that any Agricultural Education graduate who took the activities seriously during SIWES period would be endowed with the fundamental skills needed in livestock production such as cleaning of the pens, disinfection of the pens, administering routine vaccinations, among others. The findings also revealed that the respondents accepted to a moderate and little extent some of the items as the ways SIWES has equipped NCE agricultural education graduates for working in livestock enterprises. They include: predicting oestrus in farm animals, fermenting silage, treatment of sick animals, debeaking poultry, branding farm animals, dehorning farm animals, castrating male livestock among others. This was supported by ITF and University of Jos (2011) who noted that
inadequate supervision of students on SIWES by some institutions made some students turn away from the activities of the livestock farms they were attached to. The authors stated that when proper attention is not given to students on attachment in terms of supervision, there will be an attention shift on the part of students from what they are told to do to another thing else.

3. *SIWES and Techniques of Handling Agricultural Equipment and Machines.*

Findings of the study indicated that the respondents accepted to a moderate and little extent all the items as the ways SIWES has exposed Agricultural Education graduates of Colleges of Education in handling agricultural equipment and machines for agricultural production. They include: coupling plough to tractor, driving and working with tractor, using knapsack sprayer to spray agrochemicals, using milking machine to extract milk from cow, cultivating with the ridger, spraying insecticide using mist blower, among others. This was in line with the view of Umoh (2000) who reported that some employers just take students without giving them ample opportunities to work with their equipment and machines. The author noted that some employers gave irrelevant work assignment to attachees for
fear of losing their expensive and modern facilities during the course of students on-the-job training. The finding was also supported by Mafe(2010) who stated that some of the employers who accepted Agricultural Education students for SIWES were unwilling to allow the students to handle agricultural equipment and machines in fear that students might damage them.

4. **SIWES and Transition from School to Agricultural Processing Enterprise.**

The findings revealed that the respondents accepted to a very great and great extent some of the items as the ways SIWES has enhanced the transition of NCE Agricultural Education graduates from school to agricultural processing enterprises. They include: peeling of cassava tubers, processing fresh cassava to cassava chips, preparing cassava flour, making garri, preparing yam flour, preparing yam chips, making maize pulp, processing maize flour, making bean cake, processing palm oil and extracting palm kernel oil. The finding was in line with Mafe(2010) who stated that Agricultural Education students who participated conscientiously in industrial training have the benefit of acquiring agricultural processing skills and competencies. Mafe noted that the agricultural knowledge, skills and competencies acquired
through industrial training are internalized and become relevant when required to perform the jobs or functions in agricultural processing occupation after graduation.

The findings also revealed that the respondents accepted to a moderate and little extent some of the items as the ways SIWES has enhanced the transition of NCE Agricultural Education graduates from school to agricultural processing enterprises. They include: extraction of groundnut oil, pasteurizing fresh milk, homogenizing milk, creaming of milk, preparing cheese, preparing butter and sausages. This was supported by ITF and University of Jos(2011) who stated that some students equate the programme with holiday jobs while others regard the monthly stipends more important than the skills and knowledge to be gained from the scheme. The authors noted that some students might not be around when some aspects of the skills were taught by the employer.

5. **SIWES and Application of Theoretical Knowledge into Practical Work in Forestry Industry.**

The findings indicated that the respondents accepted to a very great and great extent some of the items as the ways SIWES has afforded NCE Agricultural Education graduates the opportunity of
applying the knowledge gained in theoretical work into practical work in forestry industry. They include: selection of viable seeds of trees, preparing nursery pots, carrying out nursery operations, transplanting of seedlings, integrating annual crops with young trees, weeding of plantation, fertilizer application, among others. These were in line with Olabiyi(2004) who stated that SIWES provides an excellent opportunity for Agricultural Education students to develop desired technical capabilities which balanced practical knowledge obtained in forestry industry with information obtained in school. Olabiyi noted that Agricultural Education graduates who were opportune to get placement in forestry industry during SIWES had the chances of acquiring the skills in selecting good trees species, preparing nursery, transplanting tree seedlings, fertilizer application, among others.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Restatement of the Problem

Students Industrial Work Experience Scheme (SIWES) is a skill training programme designed to expose and prepare students of higher institutions to real life work situation they would engage after graduation. Adetokunbo (2009) stated that Governments has put in place SIWES to provide short term practical training to professional students of tertiary institutions to strengthen them to the enormous task ahead of them after school.

Regrettably, Managers of Agricultural Industries were not satisfied with the work performances of Agricultural Education graduates employed in agricultural industries. Osinem and Nwoji (2010) noted that there was a growing concern among the agricultural industrialists that graduates of higher education lacked adequate practical background needed for employment in agricultural industries. Employers prefer to employ untrained youths or academic graduates and provide on-the-job training which would enable them acquire the necessary competencies and skills required in industry (Maclean and Lai, 2011).
Agricultural Education graduates of Colleges of Education passed through SIWES and were expected to acquire the necessary agricultural skills and competencies required in agricultural production. This study was therefore conceived to find out the extent to which Students Industrial Work Experience Scheme (SIWES) has impacted on NCE Agricultural Education graduates who have passed through the programme and have secured employment in agricultural industries and the related field. Specifically, the study sought to find out the extent to which:

1. Students Industrial Work Experience Scheme (SIWES) has enabled Agricultural Education graduates of Colleges of Education to acquire agricultural experiences and skills required for success in crop production.

2. SIWES has equipped Agricultural Education students for working in livestock enterprises after graduation.

3. SIWES has exposed Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural production.

4. SIWES has enhanced easier transition of Agricultural Education graduates from school to agricultural processing enterprises.
5. SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

**Summary of the Procedures Used**

The study adopted a descriptive survey research design. Five research questions were answered and five null hypotheses tested at 0.05 level of significance and 238 degrees of freedom. Appraisal of Students Industrial Work Experience Scheme (ASIWES) questionnaire was used to collect data for the study. The population for the study was 501 comprising 462 Secondary School Agricultural Science Heads and 39 identified Managers of Agricultural Industries in Enugu State. A total sample of 253 was drawn. A proportionate random sampling technique was used to sample 214 Secondary School Agricultural Science Heads and the entire 39 identified Managers of Agricultural industries were used. The research instrument was subjected to face validation by three experts from the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The reliability coefficient was 0.85, which was established through Cronbach Alpha reliability test. The questionnaire was administered by the researcher with the help of six research assistants. Two hundred and forty(240) out of two hundred and fifty three(253) copies of the questionnaire were duly
completed and returned reflecting about 94.86% return rate. The research questions were answered using Mean statistic and the items were interpreted using real limit of numbers. Five null hypotheses were tested using t-test statistic 0.05 level of significance and 238 degrees of freedom. A null hypothesis was accepted when t-calculated value was less than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom and rejected when t-calculated value was greater than t-table value of 1.96 at 0.05 level of significance and 238 degrees of freedom.

**Principal Findings**

Based on the data analyzed, the following major findings were made.

1. Twelve items on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills in crop production were accepted to a great extent.

2. Two items on the extent SIWES has enabled Agricultural Education graduates of Colleges of Education acquire agricultural experiences and skills in crop production were accepted to a moderate extent.

3. Ten items on the extent SIWES has equipped Agricultural Education students of Colleges of Education for working in livestock enterprises after graduation were accepted to a great extent.
4. Eight items on the extent SIWES has equipped Agricultural Education students of Colleges of Education for working in livestock enterprises after graduation were accepted to a moderate extent while two items were accepted to a little extent.

5. Four items on the extent SIWES has exposed NCE Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural productions were accepted to a moderate extent.

6. Eleven items on the extent SIWES has exposed NCE Agricultural Education graduates in handling agricultural equipment and machines that are necessary for carrying out agricultural productions were accepted to a little extent.

7. Nine items on the extent SIWES has enhanced the transition of NCE Agricultural Education graduates from school to agricultural processing enterprises were accepted to a very great extent while two items were accepted to a great extent.

8. Four items on the extent SIWES has enhanced the transition of NCE Agricultural Education graduates from school to agricultural processing enterprises were accepted to a moderate extent while three items were accepted to a little extent.
9. Two items on the extent SIWES has afforded Agricultural Education graduates of Colleges of Education the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry were accepted to a very great extent while seven items were accepted to a great extent.

10. Two items on the extent SIWES has afforded Agricultural Education graduates of Colleges of Education the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry were accepted to a moderate extent while two items were accepted to a little extent.

The study also revealed that:

1. There was no significant difference in the Mean responses of the respondents on the extent SIWES has enabled agricultural education graduates of Colleges of Education acquire Agricultural Experiences and skills required for success in crop production.

2. There was no significant difference in the Mean responses of the respondents on the extent SIWES has equipped NCE Agricultural Education students for working in livestock enterprises after graduation.
3. There was significant difference in the Mean responses of the respondents on the extent SIWES has exposed Agricultural Education graduates of Colleges of Education in handling agricultural tools, equipment and machines that are necessary for carrying out agricultural production.

4. There was no significant difference in the Mean responses of the respondents on the extent SIWES has enhanced the transition of NCE Agricultural Education graduates from school to agricultural processing enterprises.

5. There was no significant difference in the Mean responses of Secondary School Agricultural Science Heads and Managers of Agricultural Industries on the extent SIWES has afforded Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry.

**Conclusion**

It is certain that SIWES is very important to the acquisition of skills and competencies required by Agricultural Education students of Colleges of Education to perform efficiently in their fields of occupation after school. Some Colleges of Education however, do not have all the equipment and
machines that are needed by students for skill acquisition but are present in some agricultural industries. Therefore, SIWES is the only answer.

Consequently, it could be observed from the findings that SIWES has improved students capacity in the areas of crop production, livestock production, agricultural products processing and forestry. However, SIWES performed badly in the area of agricultural equipment and machine handling. It is now the onus of SIWES stakeholders like ITF, Agricultural Industries, Colleges of Education, Agricultural Education Students, among others to ensure that the entire objectives for which SIWES was established should be realized.

**Implications of the Study**

The findings of the study have implications for agricultural industries and the other related fields. Since agricultural industries and the other related fields absorb the graduates of Colleges of Education, they would be more dedicated in training the students during the SIWES periods. Secondly, it is a pointer to some agricultural industries who did not have the necessary modern equipment and machines that they should acquire them before participating in students training.

The findings of the study have some implications for the NCE Agricultural Education students. The students needed to be serious while on
attachment with agricultural industries to acquire the skills and competencies that would help them fit into the world of work with minimum energy after graduation. The findings also have some implications for the ITF. ITF needs to pay the SIWES allowance to students in their respective industries of attachment and not after the SIWES period

Recommendations

Based on the findings of the study, the following recommendations were made:

1. ITF should accredit and shortlist all the agricultural industries that have modern agricultural equipment and machines, and the list should be sent to schools.

2. Colleges of Education should not place students in Agricultural Industries that lack modern agricultural equipment and machines.

3. Students on SIWES should be made to know of the job specifications so that they will be aware of what they were expected to be learning within the SIWES period.

4. The industry based supervisors should be more serious with the programme so that students themselves will be dedicated.
Limitation of the Study

The following identified problems affected the generalizability of the study. They include:

1. The study dwelt on appraising the products of SIWES in Agricultural Education in Colleges of Education without appraising the SIWES processes which leads to the product.

2. The study only concentrated in appraising the products of Agricultural Education without studying the products of other programmes that engage in SIWES to ascertain if the result will be the same.

3. The study was carried out only in Enugu State. Perhaps, the result would have been different if the area of coverage was entire Nigeria.

Suggestions for Further Research

For further studies, the following research topics have been suggested.

1. The same study should be replicated to study SIWES in other Vocational courses.

2. Further research should be carried to find out the effect of SIWES processes such as Placement, Supervision, Duration, Allowances, among others on the products.

3. Appraisal of SIWES can be done on Agricultural Education graduates in Colleges of Education in Nigerian.
REFERENCES


Ugwuanyi, C.F. (2010). Challenges of Students’ Industrial Work Experience Scheme (SIWES) in Library and Information Science in


APPENDIX A

Department of Vocational Teacher Education
University of Nigeria
Nsukka
January 10, 2012

Dear Educator

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

I am a postgraduate student in the above department and university, currently carrying out a research project on the appraisal of students industrial work experience scheme graduates performance in agricultural education in colleges of education.

The attached is a draft copy of the questionnaire designed for the study as well as a copy of the research questions for guidance. You are please requested to vet the items for clarity, relevance and proper coverage for use in collecting data for the study. You are also requested to make comments and suggestions for improvement in the quality of the instrument.

Thanks for your cooperation.

Yours faithfully,

DR. E.C.Osinem
(Supervisor)

Ugwuoke Cajethan U
PG/M.Ed/Ph.D/09/50638
APPENDIX B

Department of Vocational Teacher Education
University of Nigeria
Nsukka
May 21, 2012

Dear Sir/Madam

REQUEST TO RESPOND TO A QUESTIONNAIRE

I am a postgraduate student in the above department and university, currently carrying out a research project titled: ‘Appraisal of Students Industrial Work Experience Scheme on Performance of Graduates of Agricultural Education Programme of Colleges of Education in Enugu State, Nigeria’.

The attached questionnaire is to elicit the necessary information needed for the study. You are please requested to respond to the items as objectively as possible. Every information given will be treated with strict confidentiality and will be used for the purpose of the research only.

Thanks for your cooperation.

Yours faithfully,

Ugwuoke Cajethan U
PG/M.Ed/Ph.D/09/50638
(Researcher)

DR. E. C. Osinem
(Supervisor)
APPENDIX C

UNIVERSITY OF NIGERIA NSUKKA
DEPARTMENT OF VOCATIONAL TEACHER EDUCATION

QUESTIONNAIRE ON THE APPRAISAL OF STUDENTS
INDUSTRIAL WORK EXPERIENCE SCHEME ON GRADUATES’
PERFORMANCE IN AGRICULTURAL EDUCATION IN
COLLEGES OF EDUCATION IN ENUGU STATE, NIGERIA

Please complete the following items by checking (√) in the spaces as appropriate. Data provided shall be used religiously for academic purpose and shall be treated with utmost confidentiality.

PART 1: General Information

Gender:
Male ( )
Female ( )

Category of Respondents:
Secondary School Agricultural Science Head ( )
Manager of Agricultural Industry ( )

Zone
Agbani ( )
Awgu ( )
Enugu ( )
Nsukka ( )
Obollo-afor ( )
Udi ( )

Working Experience:
1 – 5 years ( )
6 – 10 years ( )
11 – 15 years ( )
16 – 20 years ( )
21 years and above ( )
Part 2
This part is divided into five sections. Data from each section will be used to answer each research question and test appropriate hypothesis. From the options, check (√) the degree to which you feel SIWES has achieved the objectives. The following response categories are provided:

<table>
<thead>
<tr>
<th>Very Great Extent (VGE)</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Extent (GE)</td>
<td>4</td>
</tr>
<tr>
<td>Moderate Extent (ME)</td>
<td>3</td>
</tr>
<tr>
<td>Little Extent (LE)</td>
<td>2</td>
</tr>
<tr>
<td>Very Little Extent (VLE)</td>
<td>1</td>
</tr>
</tbody>
</table>

SECTION A
The Extent to which Students Industrial Work Experience has enabled Agricultural Education graduates of Colleges of Education to Acquire Agricultural Experiences and Skills Required for Success in crop production. The following statements relate to the extent to which SIWES has enabled agricultural education graduates of colleges of education to acquire agricultural experiences and skills required for success in crop production.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>VGE</th>
<th>GE</th>
<th>ME</th>
<th>LE</th>
<th>VLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCE Agricultural education graduates ability to: select suitable soils for different crops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>select viable seeds of crops for planting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>make ridges, nursery beds and mounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>transplant crops to the field.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>carry out planting operation of crops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>identify crop diseases.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>identify crop pests.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>control crop diseases using appropriate chemical.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>mix agrochemicals well.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>spray agrochemicals in the farm noting the direction of the wind.</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>identify appropriate fertilizers required by crops.</td>
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<tr>
<td>12</td>
<td>apply appropriate fertilizers at the right time</td>
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<tr>
<td>13</td>
<td>carry out weeding operation in farm</td>
<td></td>
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</tr>
</tbody>
</table>
The Extent to which SIWES has Equipped NCE Agricultural Education Students for Working in Livestock Enterprise After Graduation. The following statements relate to the extent to which SIWES has equipped NCE agricultural education students for working in Livestock enterprise after graduation.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>VGE</th>
<th>GE</th>
<th>ME</th>
<th>LE</th>
<th>VLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCE Agricultural education graduates ability to: brood chicks conveniently.</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>feed livestock with the right feed at the right time</td>
<td></td>
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<tr>
<td>3</td>
<td>prepare and disinfect pens</td>
<td></td>
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<tr>
<td>4</td>
<td>spread the litter materials in pens at the appropriate time</td>
<td></td>
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<tr>
<td>5</td>
<td>predict oestrus in farm animals</td>
<td></td>
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<tr>
<td>6</td>
<td>carry out animal dip in to control ectoparasite</td>
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<tr>
<td>7</td>
<td>deworm farm animal at the right time with the correct dewormer</td>
<td></td>
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<tr>
<td>8</td>
<td>carry out routine vaccination in farm animals</td>
<td></td>
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<tr>
<td>9</td>
<td>ferment silage for feeding farm animals at the period of scarcity of feed</td>
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<tr>
<td>10</td>
<td>detect sick livestock from the group</td>
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</tr>
<tr>
<td>11</td>
<td>cull diseased farm animal</td>
<td></td>
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</tr>
<tr>
<td>12</td>
<td>treat the sick animal</td>
<td></td>
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<tr>
<td>13</td>
<td>provide adequate ventilation in farm animal pens</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>debeak poultry to avoid cannibalism and pecking</td>
<td></td>
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<tr>
<td>15</td>
<td>brand farm animals for identification</td>
<td></td>
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<tr>
<td>16</td>
<td>dehorn farm animals correctly to reduce fighting</td>
<td></td>
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<tr>
<td>17</td>
<td>castrate male livestock at the appropriate time</td>
<td></td>
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<tr>
<td>18</td>
<td>extract milk from livestock</td>
<td></td>
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<tr>
<td>19</td>
<td>formulate feed of different types</td>
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<tr>
<td>20</td>
<td>fatten livestock for sale</td>
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</tr>
</tbody>
</table>

stake weak stemmed crops to avoid creeping on the soil surface
SELECTION C
The Extent to which SIWES has Exposed NCE Agricultural Education Graduates in Handling Agricultural Tools, Equipment and Machines that are Necessary for Carrying out Agricultural Production. The following statements relate to the extent to which SIWES has exposed NCE Agricultural Education graduates in handling agricultural tools, equipment and machines that are necessary for carrying out agricultural production.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>VGE</th>
<th>GE</th>
<th>ME</th>
<th>LE</th>
<th>VLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCE Agricultural education graduates ability to: couple plough to tractor.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>drive and work with tractor in the farm.</td>
<td></td>
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<tr>
<td>3</td>
<td>use knapsack sprayer to spray agrochemicals.</td>
<td></td>
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<tr>
<td>4</td>
<td>use milking machine to extract milk from cow.</td>
<td></td>
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<tr>
<td>5</td>
<td>cultivate the soil with ridger.</td>
<td></td>
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<tr>
<td>6</td>
<td>spray insecticide on trees using mist blower.</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>work with planters in the farm</td>
<td></td>
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<tr>
<td>8</td>
<td>trim flowers using shears.</td>
<td></td>
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<tr>
<td>9</td>
<td>harvest crops using harvester</td>
<td></td>
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<tr>
<td>10</td>
<td>harvest forages using mower.</td>
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<tr>
<td>11</td>
<td>use prismatic compass in taking bearing.</td>
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<tr>
<td>12</td>
<td>handling theodolite to measure horizontal and vertical angles</td>
<td></td>
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<tr>
<td>13</td>
<td>store agricultural tools well after use.</td>
<td></td>
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<tr>
<td>14</td>
<td>maintain the equipment and machines to prevent damage.</td>
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<tr>
<td>15</td>
<td>handle incubator for incubating eggs.</td>
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</tbody>
</table>

SELECTION D
The Extent to which SIWES has enhanced NCE Agricultural Education Graduates Easier Transition from School to Agricultural Processing Enterprise. SIWES has enhanced NCE Agricultural Education graduates easier transition from school to Agricultural processing enterprise in the following ways:

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>VGE</th>
<th>GE</th>
<th>ME</th>
<th>LE</th>
<th>VLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCE Agricultural education graduates ability to: peel cassava tubers</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>process fresh cassava to cassava chips</td>
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<tr>
<td>3</td>
<td>prepare cassava flour</td>
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<tr>
<td>4</td>
<td>make garri from cassava tubers</td>
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</tr>
<tr>
<td>5</td>
<td>prepare yam flour</td>
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</tr>
</tbody>
</table>
6 make yam chips
7 make pulp from maize
8 process maize flour
9 make bean cake
10 process palm oil for domestic and industrial use
11 extract palm kernel oil from palm kernel
12 extract groundnut oil for domestic and industrial use
13 pasteurize fresh milk extracted from cow
14 homogenize milk
15 carry out creaming of milk.
16 prepare cheese from milk and other ingredients
17 prepare butter
18 prepare sausages from fresh meat

SECTION E
The Extent to which SIWES has Afforded NCE Agricultural Education Graduates the Opportunity of Applying the Knowledge Gained in Theoretical Work into Practical Work in Forestry Industry. SIWES has afforded NCE Agricultural Education graduates the opportunity of applying the knowledge gained in theoretical work into practical work in forestry industry in the following ways:

<table>
<thead>
<tr>
<th>S/N</th>
<th>Item Statements</th>
<th>VGE</th>
<th>GE</th>
<th>ME</th>
<th>LE</th>
<th>VLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NCE Agricultural education graduates ability to: select viable seeds of trees for planting</td>
<td></td>
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<tr>
<td>2</td>
<td>prepare nursery pots with appropriate soil mixture.</td>
<td></td>
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<tr>
<td>3</td>
<td>carry out nursery operations</td>
<td></td>
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<tr>
<td>4</td>
<td>carry out transplanting of seedlings to the permanent site successfully</td>
<td></td>
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<tr>
<td>5</td>
<td>integrate annual crops with young trees</td>
<td></td>
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</tr>
<tr>
<td>6</td>
<td>weed the plantation to avoid competition</td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>apply appropriate fertilizer at the appropriate time in the plantation</td>
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<tr>
<td>8</td>
<td>prune the tree branches for upward growth</td>
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<tr>
<td>9</td>
<td>carry out fire tracing of the forest to avoid bush burning.</td>
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<tr>
<td>10</td>
<td>beat up the dead stands to make a good plantation.</td>
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</tr>
<tr>
<td>11</td>
<td>carry out budding successfully in seedlings</td>
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</tr>
<tr>
<td>12</td>
<td>carry out grafting in seedlings.</td>
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<tr>
<td>13</td>
<td>replace the harvested stand with desired specie.</td>
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APPENDIX D

Reliability

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.853</td>
<td>80</td>
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</tbody>
</table>