
Comparative Study of Technical Competencies Acquired By Agricultural Students' of Federal and State Colleges of Education in Northwest Nigeria

By

***Omodara, A. A. **Ndomi, B. M. and ***Mahmud M.**

*Agricultural Education Department
Federal College of Education, Zaria

**Vocational Education Department
Modibbo Adama University of Technology, Yola

***Agricultural Education Department
College of Education, Azare

Email: ahmedodara@yahoo.com

ABSTRACT

The study aimed at determining the levels of technical competencies acquired by Agricultural students in Federal and State Colleges of Education. The study was delimited to four States that have both Federal and State Colleges of Education in Northwest Nigeria. Survey research design was adopted in the study with a population of 932 NCE III students and a sample size of 199 using multi-stage sampling method. The instrument used to elicit information from the respondents was developed by the researcher. The instrument was subjected to face and content validity by three experts in Agricultural Education while the reliability of the instrument was established through Cronbach's Alpha coefficient which yielded an alpha value of 0.98. Independence t-test was used to analyse the data collected at 0.05 level of significance. Result of the study showed that students of Federal and State colleges acquired high level competency and there was significant difference on the level of technical competency acquired by students of Federal Colleges of Education. It was recommended among other things that lecturers of Agricultural Education should be more practical oriented in their pedagogy towards improving the level of competencies acquires by their students.

Keywords: Competency acquisition, Agricultural Education, Technical competency and Colleges of Education

INTRODUCTION

Colleges of Education (COEs) in Nigeria is the third arms of tertiary institution established by Act 13 of 1989 as amended by Act 12 of 1993 which gave a statutory responsibility of training teachers for Pre-primary, Primary and Junior Secondary Schools. The objectives of the colleges among other things include a) to provide full time courses in teaching, instruction and training in: (i) technology, applied science, humanities and management (ii) such other fields of applied learning relevant to the development of Nigeria. b) To conduct courses in education for qualified teachers. c) To arrange conferences, seminars and workshops relative to the fields of learning specified in paragraph (a) of this section. d) To perform other functions as the opinion of the Council may serve to promote the objectives of the college (National Commission for Colleges of Education: NCCE, 2013). These Colleges award Nigeria Certificate in Education (NCE) to those who successfully completed the

prescribed courses after 3 years at a College on full time or 4 – 5 years part time. This NCE is the basic qualification for teaching in Nigeria (Oritsebemigho, 2014).

All the 7 States in Northwest Nigeria have one State owned College of Education with additional one Federal College of Education located at Zaria in Kaduna State, Bichi and Kano in Kano State, Katsina in Katsina State and Gusau in Zamfara State bringing the total to 12 colleges within the zone. Among the courses studied in these colleges is Agricultural Education. This is a programme that emphasizes the preparation of learners for gainful employment in agricultural production and agricultural related business. This target informed the emphasis that is placed on skills and competency in various units of the programme for the learner's advantage. The main aim of designing NCE Agricultural Education programme is to produce competent teachers of Agricultural Science who will be able to inculcate scientific as well as technical values into the learners. To achieve these goals the following objectives were drawn for the course:

- (i) Preparation of graduates with the right attitude to, and knowledge/professional competency in Vocational Agriculture;
- (ii) Production of teachers who will be capable of motivating students to acquire interest and aptitude for agriculture;
- (iii) Develop in the student-teachers the appropriate communicative skills for effective transmission of agricultural information and skills to the students in the content of their environment;
- (iv) Equip the student-teachers with adequate knowledge and ability to establish and manage a model school farm and
- (v) Provide a sound background to enhance academic and professional progression of the student-teacher (NCCE, 2012).

In this work, attention is given to objectives (i) and (iv) that denote technical competency.

Technical competency is the level of accuracy required when an employee is in a specific domain of expertise (subject matter knowledge). This technical competence is a specific knowledge or skill area that relates to successful performance in the job. These include the specific skills and know-how to perform effectively, hence the area of focus in this study is on livestock, crops, soil and economic management. In technical competency, (otherwise known as functional competency) generally, trainees/employees are able to perform with less supervision, accept more responsibility and handle increasingly more difficult problems/challenges as their careers progress (Randstad, 2014). This study is delimited to four states in the Northwest that have both federal and state Colleges of Education so as to reduce variation in their conditions and NCE III Agricultural Education students because of their experience in the programme.

There is high unemployment amongst graduates in general in the country. This is an indication of the lack of confidence of employers of labour and industry in the training system. The problem is made worse by the general perception of fallen standards and quality in education. The perception is based on inadequate instruction occasioned by the poor quality of the training facilities, outdated equipment and admission population explosion as well as the perceived lowering of standards of admission (Moja, 2000; Okwuchukwu, 2015). It was observed by Afe (2006) that of all educational problems that beset the African continent recently, none is as prominent or as compelling as the one relating to the training of a competent teacher. A teacher is directly and indirectly bound to influence the quality and quantity of services provided by all other teachers and Professors, as poor teachers tend to reproduce their own kind. He stated further that the major problem facing the nation has been that of producing teachers of quality. The confidence of employers of labour is fast being

eroded; this is confirmed by the call for the current competency test in Kaduna State where about 23,000 teachers were laid off for failing competency test organised by the state government for primary school teachers. Agricultural Education products are not in fact left out in this quest, hence the need to confirm through this study the level of competencies acquired by these pre-service teachers.

Objectives of the Study

The objectives of this study therefore are to:

- i. Compare technical competency acquired by Agricultural Education students within Colleges of Education in livestock production.
- ii. Compare technical competency acquired by Agricultural Education students within Colleges of Education in crops and soil management.
- iii. Compare technical competency acquired by Agricultural Education students within Colleges of Education in economics management.

Hypotheses of the Study

The following null hypotheses were formulated to guide the study:

- Ho1. There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in livestock production.
- Ho2. There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in crops and soil management.
- Ho3. There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in economics management.

METHODOLOGY

Survey research design was adopted in the study for its ability to study large group by collecting data, analyzing it and drawing conclusion using representative sample (Nworgu 2006). The design was also adopted for its suitability to collect data on self assessment method (one of the three recommended methods for assessing competency viz; self, expert and peer) used in this study. The study was carried out in nine (9) Colleges of Education (COE) within the Northwest Geopolitical Zone of Nigeria covering States having both Federal and State Colleges of Education. The States are Kaduna, Kano, Katsina, and Zamfara with all having two each, except Kano State that has three colleges. The study covered only NCE III students of Agricultural Education because of their experience in the curriculum and having passed through most courses required to equip them competently towards being an effective agricultural teachers.

The population of the study was 932 NCE III Agricultural Education students of the 9 COEs located within the States. Multi-stage sampling method was adopted in selecting the sample that formed the respondents. Proportional sampling method was used in determining the sample size for each college while simple random sampling was adopted in selecting the students that form the respondents from each college. A total of 274 NCE III students formed the sample of the study based on Krejcie and Morgan (1970) population sample table. The instrument used for data collection was Questionnaire on Competency Acquired by Agricultural Education Students (QCAAES) that contained 94 items with 37 items from livestock production, 36 items from crops and soil and 21 items from economics management

that form technical competency areas in Agricultural Education. The instrument was divided into three sections which are: sections A for livestock management; B for crops and soil management and C for economic management competency. The instrument was designed inline with five point rating scale of Very High competency (VH), High competency (H), Moderate competency (M), Low competency (L) and Very Low competency (VL) with scores 5, 4, 3, 2 and 1 respectively.

The instrument was developed by the researcher and was given face and content validity through one and two experts from Vocational Education Department of Modibbo Adama University of Technology, Yola and Agricultural Education Department of Federal College of Education, Zaria respectively. Also the internal consistency of the instrument was established using Cronbach's Alpha coefficient reliability statistical tool after it was pilot tested with 20 NCE III Agricultural Education students of Federal College of Education, Yola in North East Geopolitical Zone of Nigeria and was not part of the study. The reliability of sections A, B, and C were 0.98, 0.98, and 0.98 respectively. The overall reliability coefficient of 0.98 was obtained which shows that the instrument is highly reliable.

Data was collected by the researcher personally by visiting each of the colleges and selecting the required sample of respondents by writing "Yes" and "No" on pieces of paper which were folded and mixed thoroughly in a basket for students to pick. The number of yes in the basket was equivalent of the already determined sample size for each college. Students that pick yes formed the respondents that the questionnaires were administered to. The respondents filled and return the instrument on the spot which accounted for 100% return rate of the instrument. The statistical tool used was independent t-test at 0.05 level of significance using SPSS version 20. The following scheme as used by Melak and Negatu (2012) was used to interpret the mean value of acquired competency items;

- 1.00 – 1.49 = Very Low Competency
- 1.50 – 2.49 = Low Competency
- 2.50 – 3.49 = Moderate Competency
- 3.50 – 4.49 = High Competency
- 4.50 – 5.00 = Very High Competency

The decision rule on independent t-test was where the significant P value is greater than 0.05 the hypothesis of no significant difference is upheld and concludes there is no significant difference between the mean responses on the competencies acquired. But when otherwise, the null hypothesis will be rejected and conclude there is significant difference between the mean responses on the competencies acquired (Ebuh, 2013).

RESULTS AND DISCUSSIONS

Hypothesis 1: *There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in livestock production.*

The 37 competencies items on livestock production are: Students ability to identify various breeds of rabbit present in Nigeria; Identify various classes of birds that constitute poultry; Identify various breeds of ruminant animals in Nigeria; Identify various breeds of swine in Nigeria; Propose appropriate construction of housing facilities for livestock; Identify facilities needed to manage livestock housing; Cleaning and fumigation of livestock pens; Propose appropriate feed at right age for poultry; Propose appropriate feed for other livestock; Identify and explain the functions of six nutrients required by livestock; Identify malnutrition

in livestock; Take corrective measures for livestock malnutrition; Effectively handle eggs in hatchery; Effectively handle Day old Chicks setting in brooding house; Explain genetic inheritance in livestock; Explain the benefits of natural mating; Explain the benefits of artificial insemination; Identify successfully animals on heat; Observe bio-security in livestock section; Taking an animal's temperature and pulse rate accurately; Identify various pests of livestock; Identify various diseases symptoms of livestock; Take control measures for pests of livestock; Take control measures for diseases of livestock; Observe appropriately vaccination programmes in poultry; Effectively handle eggs without allowing contaminated products into the market; Effectively handle milk without allowing contaminated products into the market; Effective keeping of farm records in livestock; Experience in Beekeeping; Identify various facilities needed in beekeeping; Identify various available fish that can be raised under pond conditions; Effectively establish pond under different conditions; Effectively manage and maintain hygiene of pond water; Identify appropriate feed type/size for fish of various ages; Identify various fishing gears available locally; Identify when to apply fertilizer/lime to a pond and Identify easily symptoms of various diseases in fish.

Table 1: t-Test on Livestock Production Competency between FCE and COE

Competency	n	\bar{x}	S	df	t _{cal}	Sig.
FCE	37	3.85	0.323	72	4.204	0.000
COE	37	3.54	0.302			
NB:	n	Means responses on items	74			

Result on Table 1 shows the means of livestock competencies acquired by Federal Colleges of Education and State Colleges of Education was 3.85 and 3.54 respectively. Even though they both showed that high levels of competencies were acquired, result of the t-test independent shows that there is significant difference on the level of competencies acquired between FCE and COE students in livestock competencies with $P 0.000 < 0.05$. The null hypothesis of no significant difference between the mean responses of students on these competencies is rejected. The result implied that Agricultural Education students in Federal Colleges of Education are more competent in livestock areas than their counterparts from State Colleges of Education.

This is in agreement with the assertion of Lawal, Onipede, Oketoobo, and Famiwole (2014) in a study of competency need of Agricultural Science teachers in Ondo State, where they concluded that secondary schools teachers, the bulk of which are products of State Colleges of Education, did not possess competency required in animal production. On the contrary Duncan and Ricketts (2008) affirmed the idea that teachers of secondary schools were competent in technical construct and other areas regardless of their mode of training.

Hypothesis 2: *There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in crops and soil management.*

The 36 competencies items responded to by the respondents on Crop and Soil managements are: Students ability to identify different classes of crops grown in Nigeria; Carryout land preparation activities for various crops; Identify planting dates for various crops; Identify planting spacing of various crops; Identify an appropriate soil required by various

crops; Identify symptoms of various diseases of crops; Identify symptoms of various pests of crops; Control/take preventive measures of Pests of crops; Control/take preventive measures of diseases of crops; Identify fertilizer needs of various crops; Identification of different nutrient deficiency symptoms in crops; Carryout weed identification and control; Carryout herbicides application appropriately; Read and interpret labels/instructions on agro-chemicals accurately; Carryout effectively thinning on various crops; Carryout harvesting at right time; Use correct method of harvesting of various crops; Processing of various crops; Effective preservation of various crops; Effective storage of various crops; Carryout appropriate husbandry measures for the nursery; Handling of various Horticultural practices; Carryout soil sampling with appropriate tools; Determine which soil is appropriate for various crops; Identify appropriate irrigation method for various crops; Determine water needs level of various crops during irrigation; Effective planning and composition of crops rotation in a farm; Observe appropriate water conservation methods on various soil type; Carryout water erosion control on various type of soil; Carryout experiments on soil samples; Identify various farm tools with their uses; Coupling of implements on tractor; Operate tractor successfully on the farm; Carryout maintenance on all the farm tools/implements; Diagnose common tractor problems and Effectively control wind erosion in your area.

Table 2: t-Test on Crops and Soil Management Competency between FCE and COE

Competency	n	\bar{x}	S	Df	t _{cal}	Sig.
FCE	36	3.92	0.338	70	2.98	0.004
COE	36	3.68	0.323			
NB: n	Means responses on items		72			

The means response of students on crops and soil management in both Federal and State Colleges of Education on Table 2 are 3.92 and 3.68 respectively. The result shows that they both acquired high competency level. However the result of t-test independent shows that there is significant difference on the level of competencies acquired between FCE and COE students in crops and soil management competencies with $P 0.004 < 0.05$. The null hypothesis of no significant difference between the mean responses of students on these competencies is rejected. The result indicated that Agricultural Education students in Federal Colleges of Education are more competent in crops and soil management areas than their counterparts from State Colleges of Education. This result also agrees with the conclusion of Lawal *et al* (2014) that Agricultural Science teachers in Ondo State did not possess required competency in crop production. On the contrary Oladele, Subair and Thobega (2011) claimed that students of Agriculture in Botswana acquired high competency in soil and crop management after their Field Practical Training (FPT) year outside the school.

Hypothesis 3: *There is no significant difference between the mean responses of students of Federal and State COEs on competencies acquired in economics management.*

This section comprises of 21 competencies items on economic management which are: Students ability to keep accurate farm record keeping; Identify investment opportunities; Creativity in your endeavour; Averting risks in business; Decision making when faced with more than one options; Identifying favourable sources of finance for agricultural business;

Identifying appropriate processing and storage methods for various produce; Application of the law of demand/supply on agricultural produce; Handling of market information; Identify appropriate market for one's products; Proper packaging of product for market; Understand when to bring your products to market; Manage funds allocation for project; Farm resources management (man, crops, livestock, soil and facilities); Take decision on production under unfavourable condition; Preparation of Profit and Loss Account; Carryout cost benefit ratio; Carryout comparative cost advantage especially on input sourcing; Carryout most economic combination of inputs; Determination of economic level of production and Maximisation of profit in an enterprise.

Table 3: t-Test on Economical Management Competency between FCE and COE

Competency	n	\bar{x}	S	df	t _{cal}	Sig.
FCE	21	3.87	0.254	40	4.628	0.000
COE	21	3.52	0.274			
NB: n	Means responses on items		42			

Result on Table 3 shows that the means of economics management competencies acquired by Federal Colleges of Education and State Colleges of Education was 3.87 and 3.52 respectively. They both showed that high levels of competencies were acquired, but the t-test independent shows that there is significant difference on the level of competencies acquired between FCE and COE students in economics management competencies with $P 0.000 < 0.05$. The null hypothesis of no significant difference between the mean responses of students on these competencies is rejected. The result implied that Agricultural Education students in Federal Colleges of Education acquire more competencies in economics management than the students from State Colleges of Education. The result was supported by Ayanda, Yusuf, and Salawu (2013) who observed an above average mean in a study on students' ability in economics parameters of agriculture. This result contradicted Omodara (2016) stand on high level of competency acquired by students of Agricultural Education from all Colleges of Education from North-West Nigeria.

CONCLUSION

Based on the findings of this study that student of Agricultural Education in the Northwest acquired high level competencies in technical areas and there is significant difference between FCE and COE students on the three areas that make up technical competency. It is therefore concluded that Students of Agricultural Education in Federal colleges are technically more competent in livestock, crops and soil management and economical management than the State college's students in Northwest Nigeria.

RECOMMENDATIONS

- i. State Colleges of Education staff should put in more effort at improving the level of competencies acquired by their students in livestock production generally.
- ii. The facilities for teaching crops and soil practically should be provided by the College management especially in State Colleges of Education so that their students can measure up to their counterparts in Federal Colleges within the zone.

- iii. On the part of lecturers of Agricultural Education, more effort should be put in place to improve the level of competency acquired by their students on economics intricacies by relating real life situations to class experiences.

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