



LECTURERS' PERCEPTION ON TASKS AND OPERATIONS EXPECTED FOR ASSESSMENT OF AGRICULTURAL PRACTICALS IN COLLEGES OF EDUCATION IN ADAMAWA AND TARABA STATES, NIGERIA

¹Musa, I. G. and ²Harrison, G. M.

¹National Institute of Fresh Water Fisheries Research, New Bussa, Niger State, Nigeria

²Department of Vocational and Technical Education, Adamawa State University Mubi, Nigeria.

Correspondence: gideonharrison7878@gmail.com 08037013652

Abstract

The study was carried out to determine lecturers' perception on tasks and operations expected for the assessment of agricultural practical in Colleges of Education in Adamawa and Taraba States, Nigeria. Three research questions and two null hypotheses were formulated to guide the study; the hypotheses were tested at 0.05 level of significance. The population of this study was 50 agriculture education lecturers teaching practical agriculture in Colleges of Education in Adamawa and Taraba States, sample and sampling techniques were not used in the study because the entire population was manageable and used for the study. Data were collected using a researcher designed instruments titled Instrument for Assessing Students' Skills in Agriculture Practical (IASSAP), Expected Tasks and Operations for Agricultural Practical (ETOAP) and Observable Skills Assessed by Lecturers during Agricultural Practical (OSALAP). Mean was used to answer the research questions while z-test was used to test the hypotheses. The findings of this study revealed that 26 tasks and operations were identified as expected tasks and operations to be carried out by the students during agricultural practical on the field. The hypotheses tested revealed that there is no significance difference in the means rating of the lecturers in Federal and State Colleges of Education on observable skills and expected tasks and operations appropriate for assessing agriculture practical in the Colleges of Education. It was recommended that when assessing practical skills lecturers should use appropriate, comprehensive and objective instrument that contains the tasks and operations expected to be performed by the students of agriculture during the process of carrying out agriculture practical.

Keywords: Task, Assessment, Practical Agriculture and Colleges of Education

Introduction

The benchmark provided by the National Commission for Colleges of Education (NCCE, 2012) equip students in colleges of education with necessary agricultural practical, manipulative and communicative skills and farming techniques. Practical agriculture is a compulsory course at National Certificate in Education (NCE) agricultural education programme. The course is aimed at developing student skills in crop production, animal production and soil science. It promotes learning by doing, where students combine theoretical knowledge and hands on skills during programme implementation. Olotosin and Oluwaseun (2020) opined that practical agriculture is basically the involvement in farming activities such as crops and livestock and other aspects of agriculture like aquaculture among others.

Practical agriculture is carried out to ensure that practical skills are imported to students to enable them become self-reliant, resourceful and useful to the society. During practical lessons, students observe or manipulate real objects or materials for themselves to ensure that learners are exposed to and taught the basic principles that are important to agricultural production in the country. Practical agriculture is very relevant hence its inclusion in the benchmark provided by the National Commission for Colleges of Education (NCCE) minimum academic standard. The NCCE (2012) stipulates that agricultural education programme aims at:

1. Equipping the students-teachers with adequate knowledge and ability to establish and manage a model school farm effectively.



Musa, I. G. and Harrison, G. M.

2. Providing a sound background to enhance further academic and professional progression of the students-teachers.
3. Producing teachers who will be capable of motivating students to acquire interest in and aptitude for agriculture.
4. Preparing graduates with the right attitude to and knowledge/professional competences in vocational agriculture. and
5. Develop in the students-teachers the appropriate communicative skills for effective transmission of agricultural information and skills to the student in the context of their environment.

Practical agriculture can be assessed using task and operations. According to Chukwudi (2009), tasks and operations provide students with opportunity to attain practical farming experience which they frequently lack. Crop production project was initiated with the objectives of helping students to develop practical skills. Although, course laboratories provide some practical experience as observed by some lecturers, many students benefit from additional field work. Instructional program must be flexible enough to meet the needs of students from a variety of backgrounds. Those who lack practical farming experience must have the opportunity to develop practical skills if they are to fully participate in the future agronomic practices.

Chukwudi (2009) further reported that, cultural practices are classified into pre-planting, planting and post-planting operations. By practical agricultural curriculum, students should be able to carry out such operations on the farm; such operations entail all the activities carried out in the farm from land preparations to the harvest. Pre-planting operations refer to all the operations carried out on the farm before planting of crops. It includes practices such as land clearing, stumping, burning, field layout, tillage and ridges. Planting operations includes sowing of seeds, mulching, thinning, transplanting, weeding, fertilizer application, pest and disease control; while the harvesting, sorting, grading, processing, bagging and storage are some of the final activity in the post-planting operations of crop production practice. Therefore, students need to be assessed based

on tasks and operations in these production practices.

Assessment is the process of identifying, gathering and interpreting information about students' learning. The central purpose of assessment is to provide information on students' achievement and progress are set to the direction for on-going teaching and learning. It provides information for those involve in the teaching and learning process to compare what is known and can be demonstrated against the standards. Abubakar (2009) opined that assessment involves the collection of data and the use of such data to determine the effectiveness or quality of a programme or performance.

Abubakar further stated that it is the function of educational assessment to determine extent to which the purpose of a programme is being achieved. It is obvious from the definition that assessment involves measurement that enhances value judgment in education. Assessment has to do with process involved in investigating the status of an individual or group usually with reference to expected result or outcome.

Effective assessment therefore becomes a thing of great concern especially for practical courses in Colleges of Education. This is because the teacher must be concerned about the manipulative skills of the students in college of education. The student cannot be properly assessed without the use of standard instruments that will clearly state the tasks and operations expected for assessing of students' agricultural practical in Colleges of Education in the study area. It is against this background that the researcher deems it necessary to determine lecturers' perception on tasks and operations expected to be used by the teacher for assessing of agricultural practical in Colleges of Education.

Statement of the Problem

The ineffectiveness of practical skills acquisition as a result of challenges confronting school authorities and teachers in the teaching and learning of practical agricultural science as observed by Diise, Zakaria and Mohammed (2018) is demonstrated in agricultural science



Musa, I. G. and Harrison, G. M.

students' general lack of technical and employable skills. Some agricultural education lecturers do not take time to closely observe their students as they carry out farm operations in the field, they only visit the field to assign grade to students based on completed work instead of proper assessment at every stage of each task. It is however observed by some researchers that there is generally lack of well-prepared assessment instrument for practical agriculture in colleges of education in Nigeria. The researchers also pointed that practical activities are being assessed based on completed work only that is product assessment rather than process assessment which constitute tasks and operations expected to be demonstrated by students of agriculture; this is a serious error. Effective assessment therefore needs a special consideration especially in practical courses at colleges of education. This consideration for assessment of manipulative skills is to meet up the requirement for National Commission for Colleges of Education (NCCE) minimum standard curriculum. Technical and vocational education teachers have difficulties in the assessment of practical employed by teachers which is looking at completed work and assign grade to students- obviously which students are assessed without the use of standard instrument decision taken based data obtained from such unreliable assessment and will often prove wrong and misleading. Therefore, there is a need to improve the ways of assessing psychomotor skills in practical agriculture. In view of the above, if these problems remain unchecked agricultural education teachers would continue assessing students based on product assessment (students completed work) rather than process assessment and these would always affect the true picture of the ability of agricultural education student practical's skill acquisition due to subjective assessment. In view of the above, researcher intends to determine lecturers' perception on tasks and operations expected for assessing agricultural practical which will be used to tackle the problem of assessing practical agriculture in colleges of education in Adamawa and Taraba states of Nigeria.

Purpose of the Study

The purpose of the study was to determine lecturers' perception on tasks and operations expected for assessing agricultural practical in colleges of education.

The specific objectives of the study are;

1. Determine the tasks and operations expected to be carried out by the students in Agricultural practical on the farm
2. Determine the tasks and operations expected to be carried out by the students in Agricultural practical in storage
3. Identify the observable skills to be assessed by the lecturers during Agricultural practical

Research Questions

The following research questions were raised to guide the study

1. What are the tasks and operations expected to be carried out by the students in Agricultural practical on the farm?
2. What are the tasks and operations expected to be carried out by the students in Agricultural practical in store?
3. What are the observable skills to be assessed by the lecturer during Agricultural practical?

Hypotheses

The following null hypotheses were postulated and tested at 0.05 levels of significance:

- H₀₁ There is no significant difference in the mean rating of the lecturers in Federal and State Colleges of Education on observable skills for assessing agricultural practical
- H₀₂ There is no significant difference in the mean rating of the lecturers in Federal and state Colleges of Education on tasks and operations expected for assessing agricultural practical

Methodology

This study employed survey research design. The study was carried out in Adamawa and Taraba States of Nigeria. Adamawa State is located within the North-East Geo-political



Musa, I. G. and Harrison, G. M.

zone, Adamawa State lies between latitude 7° and 11° North of the equator and between longitude 11° and 14° East (Adebayo & Tukur, 1999). Taraba state is located between longitude $9^{\circ} 30'$ and $11^{\circ} 45'$ and latitude $6^{\circ} 30'$ and $9^{\circ} 36'$ and lies within the North-East of Nigeria (Taraba State Diary, 2014). The population for this study was 50 Agriculture Education lecturers teaching practical Agriculture in Colleges of Education with 19 from Federal College of Education Yola, 14 from College of Education Hong, Adamawa State and 17 from College of Education Zing, Taraba State. The entire population was used for the study. Instrument Assessing Students Skills in Agricultural Practical (IASSAP) was used to produce a questionnaire titled Expected Tasks and Operation for Agricultural Practical (ETOAP) The instrument was a close ended questionnaire on 5 points rating scale as follows: Highly Expected (HE), Expected (E), Moderately Expected (ME), Not Expected (NE) and Highly Not Expected (HNE). To determine expected operational tasks and practical skills appropriate for inclusion in final instrument assessing students' skills in agricultural practical (IASSAP), the ETOAP was administered to 50 lecturers in agricultural education department of 3 colleges of education in Adamawa and Taraba States. A draft copy of ETOAP was subjected to content

and face validation by expert. The experts were made up of two lecturers from the Department of Vocational Education, Modibbo Adama University of Technology, Yola and one lecturer from the Department of Technology Education Modibbo Adama University of Technology, Yola. A pilot study of the draft instrument (ETOAP) was carried out on ten (10) NCE students of agricultural practical at Federal College of Education Technical Gombe, Gombe State which was not part of the study area. The reliability of the instrument was determined using Cronbach alpha formula. The reliability coefficient obtained from the instrument was 0.76. The questionnaire (ETOAP) was used to collect data which was administered personally to the lecturers in agricultural education department by the researchers. The data generated for the study was analyzed using Statistical Package for Social Science (SPSS V21.0) mean and standard deviation was used to answer research question while z-test was used to test null hypotheses at 0.05 level of significance.

Results

Research Question 1

What are the task and operations expected to be carried out by the students in Agricultural practical on the field?



Musa, I. G. and Harrison, G. M.

30-39

Table 1: Mean Ratings of Lecturers on Expected tasks and operations to be carried out by Students in Agricultural Practical on the field (N = 50)

S/N	Task and Operations	Mean	Std. Dev.	Remark
1	Stumping	3.84	1.22	E
2	Cutting of grasses	3.98	1.25	E
3	Farm layout	4.20	1.13	E
4	Measurement of bed	3.88	1.32	E
5	Seed bed preparation	3.90	1.33	E
6	Boring holes for planting	3.84	1.25	E
7	Placement of seed in holes	3.94	1.25	E
8	Lifting of seedling from nursery	3.82	1.19	E
9	Transporting of seedling to farm	3.80	1.18	E
10	Placement of seedling in holes	3.94	1.08	E
11	Mechanical or physical control of weeds	4.20	1.11	E
12	Biological control of weeds	4.12	1.19	E
13	Cultural control of weeds	4.18	1.17	E
14	Chemical control of weeds	4.08	1.23	E
15	Broadcasting of fertilizer	3.96	1.25	E
16	Placement of fertilizer	3.96	1.23	E
17	Drilling of fertilizer	4.08	1.21	E
18	Mulching	4.14	1.13	E
19	Placement of mulches on seed beds	3.92	1.35	E
20	Cutting down stem of plants	3.76	1.29	E
21	Plucking of crops	3.96	1.14	E
22	Removing of crops from the farm	4.04	1.23	E
23	Slum drying	3.94	1.25	E
24	Threshing	3.86	1.18	E
25	Winnowing	4.18	1.08	E
26	Shelling	4.12	1.08	E
	Grand Mean	3.99		

Table 1 shows results of mean and standard deviation of lecturers on the task and operations expected to be carried out by the students in Agricultural practical in Colleges of Education on the field. About 26 expected tasks and operations were identified and all have mean ratings above the cut-off point of 3.50. The mean ratings of the responses range from 3.84 to 4.20 with standard deviation range of 1.08 to

1.33. The grand mean of 3.99 which is above the cut – off point indicated that all the items are appropriate for inclusion in the final draft of IASSAP.

Research Question 2: What are the task and operations expected to be carried out by the students in Agricultural practical in the store?



Musa, I. G. and Harrison, G. M.

30-39

Table 2: Mean Ratings of Lecturers on Expected tasks and operations to be carried out by Students in Agricultural Practical in the store (N = 50)

SN Task and Operations	Mean	Std. Dev.	Remark
1. Storage with Granaries	3.88	1.27	E
2. Storage with Jute sacks	3.98	1.25	E
3. Storage with Clay pots	4.10	1.17	E
4. Storage with Baskets	4.10	1.17	E
5. Storage with Silos and bins	4.10	1.18	E
Grand Mean	4.03		

Table 2 shows results of mean and standard deviation of responses of lecturers on the task and operations expected to be carried out by the students in Agricultural practical in Colleges of Education in the store. About 5 expected tasks and operations were identified and all have mean ratings above the cut-off point of 3.50. The mean ratings of the responses range from 3.88 to 4.10 with standard deviation range of

1.17 to 1.27. The grand mean of 4.03 which is above the cut – off point indicated that all the items are appropriate for inclusion in the final draft of IASSAP.

Research Question 3: What are the observable skills to be assessed by the lecturer during Agricultural practical?



Musa, I. G. and Harrison, G. M.

30-39

Table 3: Mean Ratings of Lecturers on Observable Skill to be assessed by Lecturers During Agricultural Practical N = 50

S/N	ITEM	Mean	Std. Dev.	Remark
1	Selection of tools	4.12	1.10	E
2	Manipulation of tools	4.04	1.12	E
3	Care of tools during task	4.18	1.17	E
4	Observation of safety precaution during task	4.16	1.15	E
5	Timelines completing task	4.08	1.12	E
6	Care of tools before task	4.08	1.18	E
7	Quantity of completed task	4.14	1.18	E
8	Promptness to begin the task	4.04	1.14	E
9	Ability to identify suitable soil type	4.06	1.15	E
10	Ability to use correct planting seed	4.24	.894	E
11	Ability to use correct spacing	4.08	1.09	E
12	Ability to use correct planting depth	4.14	1.03	E
13	Ability to identify number of seed per stand	4.32	.999	E
14	Ability to identify week seedling	4.14	1.16	E
15	Ability to identify fertilizer type	4.18	1.19	E
16	Ability to use right method of application	4.20	1.11	E
17	Ability to identify the right of application	4.16	1.11	E
18	Ability to apply fertilizer uniformly	3.98	1.27	E
19	Ability to identify strong stick	4.02	1.27	E
20	Ability to stake enable plants stand erect	3.92	1.20	E
21	Ability to identify mature crop	4.08	1.01	E
22	Ability to use proper harvesting tools	4.18	0.94	E
23	Ability to dry the crops	4.04	1.03	E
24	Ability to separate grain from the stalk	4.18	0.85	E
25	Ability to remove the chaff from the grains	4.06	1.10	E
26	Quality of completed task	4.18	1.12	E
27	Ability to use appropriate storage facilities	4.12	1.10	E
28	Ability to use right preservatives	4.30	1.02	E
29	Ability to care for tools after work	4.32	0.96	E
30	Ability to identify pest and disease	4.40	0.81	E
31	Ability to mix chemical correctly	4.42	0.88	E
32	Ability to use knapsack sprayer	3.98	1.21	E
	Grand Mean	4.14		

Key: E = Expected

Table 3 shows the mean ratings and standard deviation of responses of lecturers on observable skills to be assessed by the lecturers during agricultural practical. The observable

skills identified from literatures are displayed with their mean ratings and standard deviation. The mean ratings of the responses of lecturers on observable skills range from 3.92 to 4.40



Musa, I. G. and Harrison, G. M.

with standard deviation ranged from 0.80812 to 1.26958. The grand mean of 4.14 which is above the cut – off mean of 3.50 indicated that the observable skills identified are needed in carrying out agricultural practical operations.

Hypothesis One

H₀₁ There is no significant difference in the mean ratings of the lecturers in Federal and State Colleges of Education on the appropriate observable skills

Table 4: z-test Result of Mean Ratings of Lecturers in Federal Colleges of Education and State Colleges of Education on the Appropriate Observation Skills

Lecturers	N	Mean	Std. Dev.	Z	Df	P - value	Remark
Federal Colleges of Education	19	4.1579	1.01451	-0.011	48	0.47	Accepted
State Colleges of Education	31	4.1613	1.06761				

Analysis in Table 4 shows z – test result conducted to test whether significant difference exist in the mean ratings of lecturers in the Federal Colleges of Education and State Colleges of Education. The result show that there is no significant difference in the mean ratings of lecturers in the Federal Colleges of Education and State Colleges of Education $z_{(48, 0.05)} = -0.011, p > 0.05$. This means that the null hypothesis is accepted.

$z_{(48, 0.05)} = -0.011, p > 0.05$. This means that the null hypothesis is accepted.

Hypothesis Two

H₀₂ There is no significant difference in the mean ratings of the lecturers in Federal and State Colleges of Education on the appropriate practical tasks and operations

Table 5: z-test Result of Mean Ratings of Lecturers in Federal Colleges of Education and State Colleges of Education on the Appropriate Practical Tasks and Operations

Lecturers	N	Mean	Std. Dev.	Z	Df	P - value	Remark
Federal Colleges of Education	19	3.9474	1.26814	-0.141	48	0.45	Do not reject
State Colleges of Education	31	4.0000	1.29099				

Table 5 shows a result of z – test statistic conducted to test whether significant difference exist in the mean ratings of lecturers in the Federal Colleges of Education and State Colleges of Education on the appropriate practical task and operations. The result show that there is no significant difference in the mean ratings of lecturers in the Federal Colleges of Education and State Colleges of Education $z_{(48, 0.05)} = -0.141, p > 0.05$. This means that the null hypothesis is not rejected.

under seven identified tasks ranging from Land Clearing, Planting Operation, Weeding, Fertilizer Application, Harvesting, and Processing were expected of students to display during agricultural practical and therefore considered appropriate for assessment of agricultural practical in Colleges of Education. This implies that all the skills identified can be used in assessing students' practical performance in agriculture. This finding was corroborated with that of Yaduma (2007) who stated that all the items of the assessment instrument he developed are appropriate for use in assessing students' practical performance. The second finding showed the tasks and operations done in the store by students during agricultural practical in Colleges of Education, these main operations identified do not come as surprise as its agrees with Chukwudi (2009)

Discussion

The finding of the study was arranged and discussed in the same other which the three research questions answered and the two null hypotheses tested were discussed in line with the findings of other researchers. It was found that the 26 practical skills operations classified



Musa, I. G. and Harrison, G. M.

that the farm operation are those operations carried out on the farm from land preparation to harvesting and storage. other farm operation that are not main operation such as stumping cutting of grasses, raking farm layout seed bed preparation, boring of holes and placement of seed, striking of weeds, tinning, mulching, spraying and drying were considered as sub-operational task for inclusion in the IASSAP as supported by Yalams (2001) who said students practical assessment which may have involve operation without assessing the process by which the operation are carried out would not give a true assessment of students skills.

The third finding of the study identified thirty-two observable skills mostly valued and assessed by lecturers when assessing their students during practical. Nine of the observable skills are relevant to all the practical operations, these include selection of tools, manipulation of tools, Kinesthetic posture on the job, promptness to starting a given task, care of tools during work, observation of safety precaution during work, timeline in completing the job, care of tools after work and quality of the completed job.

Since process assessment has to do with observation of performance and passing of judgment, Okoro (2005) stated that the best way to go about it is through observation and rating scale. It is therefore not out of place to identify the observable skills in this study of process assessment. This is so because of the great need to consider for instance selection and manipulation of tools for any instrument develop for practical subjects. You do not expect any good result if a wrong tool is used for any operation and in the same way if a right tool is wrongly manipulated the same poor result is the outcome. No wonder Jimba (2011) stated that correct manipulation of tools through proper kinesthetic posture (body movement) when carrying out any specific operation must be ensured in carrying out any task in Agricultural Practical, it is very important to observe safety precaution this is the reason why care of tools as well as safety of workers around is reflected in the observation skills in the IASSAP. These findings agree with Ibrahim (2012), Jimba (2011) and Yaduma

(2007) who stated that where safety is ignored or compromised for speed, accuracy of the final product as well as the danger of equipment damage and human injury is brought close. Hence including safety of workers in the instrument is not out of place.

The finding of the study also revealed that there is no significant difference in the mean ratings of the lecturers in Federal and State Colleges of Education on the appropriate observable skills. This means that both the lecturers in the Federal and State Colleges of Education considered the items in the instrument used for data collection as appropriate for measuring practical performance in agricultural science.

Lastly, the finding of the study revealed that there is no significant difference in the mean ratings of the lecturers in Federal and State Colleges of Education on the appropriate practical task and operations. This implies that both the lecturers have agreed that the instrument is relevant for use as assessment instrument for measuring practical students' performance in agriculture.

Conclusion

The identified tasks and operations for assessing students' practical skills in agriculture in Colleges of Education were relevant and could be used, task and operations to be carried out in the store were also relevant, also the observable skills should be considered in assessing students during agricultural practical. On the basis of this conclusion, it is expected that the lecturers in Colleges of Education in Adamawa and Taraba states would use the instrument in assessing students' practical agricultural skills especially as a process assessment not product assessment.

Recommendations

The following recommendations were made based on the findings of this study:

1. The colleges of education should ensure that when assessing practical skills, lecturers use appropriate, comprehensive and objective instrument to assess tasks and operations on the field.
2. The practical agriculture lecturers in colleges of education should use the



Musa, I. G. and Harrison, G. M.

instrument for assessing students' performance in practical agriculture in the store.

3. The National Commission for Colleges of Education should consider introducing the developed of process assessment instrument in all the Colleges of Education in Nigeria.

References

Abubakar, U. (2009). Development and Validation of an Instrument for Evaluating Administrative Skills of Science and Technical College Principals in Nigeria. Unpublished PhD thesis ATBU Bauchi.

Adebayo, A. A. & Tukur, A. L. (1999). *Adamawa State in Maps*. Yola: Paraclet Publishers.

Chukwudi, G. M. (2009). Crop Production Practice Work Book. Second Edition, Makurdi: Onimis Solid Press.

Diise, A. I., Zakaria, H. & Mohammed, A. A. (2018). Challenges of Teaching and Learning of Agricultural Practical Skills: The Case of Awe Senior High School in the Upper East Region, Ghana. *International Journal of Agricultural Education and Extension*, 4 (2): 167-179.

Ibrahim, D. (2012). Development and Validation of an Instrument for Assessing Students' Manipulative Skills in Brick Laying and Lock Laying Practice at Technical College in Niger state; Nigeria. Unpublished paper presented at industrial and technology education Department Federal University of Technology Minna.

Jimba, N. I. (2011). Development, Validation and Testing of an Instrument for Measuring Process-Skills in Electrical Machines and Power for NCE-Technical Students. Unpublished M. Tech Thesis, Abubakar Tafawa Balewa University, Bauchi.

National Commission for Colleges of Education NCCE (2012). Nigeria Certificate in Education Minimum Standard for Vocational and Technical Education 4th Edition.

Okoro, O. M. (2005). Programme Pvaluation in Education. Uruawunu-Obasi Pacific Publishers.

Olutosin, A. O. & Oluwaseun, A. O. (2014). Investigating Academic Performance in Practical Agriculture: Evidence from Single-sex and Co-educational High School. *International Journal of Agricultural Education and Extension*. 6 (1), 288-299

Taraba State Diary (2014). Taraba State Government, Jalingo, Taraba State: Nigerian Government Printing Press.

Yaduma, P. S. (2007). Development and Validation of an Instrument for Assessing Students Performance in Block/Brick Laying and Concreting in Technical Colleges. Unpublished PhD Thesis Abubakar Tafawa Balewa University, Bauchi.

Yalams, S. M. (2001). Development and Validation of process metal work evaluation scheme Unpublished PhD thesis University of Nigeria a Nsukka.