







indices of 0.89 and 0.78 for the Psycho-productive Multiple Choice Test items and the Focus guide respectively, while Pearson Product Moment Correlation coefficient was used to obtain the reliability of the CCSQI and a coefficient reliability of 0.83 was obtained. Twenty eight copies of the 20-item PCMT were administered on the teachers of agriculture by the researchers and their three research assistants on a one to one basis in their offices. After an interval of one month, 28 copies of the 46- CCSQI were administered on the same respondents after an interval of one month with duration of three days for completion and return of the questionnaire. All copies of questionnaire administered were retrieved intact due to that help of the research assistants who are internal members of staff of the Colleges. Frequency counts and percentages were used for the Psycho-productive Multiple Choice Test items to determine Quality Assurance of teachers; while the Improvement Needed Index (INI) was used for the CCSQI in order to identify areas where teachers of agriculture require improvements (Competency Gaps in teaching yam production to students. Quantitative analysis was used for data collected by the Focus Group Discussion Guide.

In arriving at decisions on the aspects where Quality was assured; Competence Gaps of the teachers and aspects where improvements were needed, the following were used; scores above 50% imply High Competency (HC); 50% to 40% indicates Average Competency (AC); 39% to 30% means Low Competency (LC); and below 30% was interpreted to mean Very low Competency (VLC) or Not Competent. Quality was interpreted to be ASSURED where the teachers have 50% and above competency. Quality was perceived as NOT ASSURED where there is lack of competency, (49% and below).

An Improvement Needed Index (INI) was used in taking decision on areas where improvement was needed. The weighted mean needed for each aspect was represented by ( $\bar{X}_N$ ) while the weighted mean performance of respondents for each aspect was represented by ( $\bar{X}_P$ ). The difference between the two Means, that is ( $\bar{X}_N - \bar{X}_P$ ) was determined to indicate Performance Gap (PG) which could yield a zero (0), negative (-ve) or positive (+ve) values. A zero (0) value indicates that Improvement was not needed since the level at which the teachers performed was equal was to the level that was required, hence zero value differentia. A negative (-ve) value differentia implies that there was no need for improvement because the level at which the teachers performed was higher than what was needed. A positive (+ve) value differentia indicates that Improvement was needed since the level at which the teachers performed was lower than what was needed.

**4. Results/ Discussion**

The results for the study are presented in four tables as follows:

**Research Question 1:** In what aspects of teaching of yam production to students do teachers have and lack competencies and in what aspects are Quality Assured?

**4.1 Table 1**  
**Frequency counts and Percentage Scores of Agriculture Teachers on their Competencies (N=28)**

**Key:** LC=Low Competence; HC=High Competence; AC=Average Competence QNA= Quality Not Assured; QA=Quality Assured

Table 1 shows the Quality Assurance/ Competency Levels of the teachers in teaching yam production. The table reveals that the teachers had High Competencies in teaching planting and post-planting and harvesting operations with 50%; 64% and 68% scores respectively indicating that Quality was Assured (QA) in these aspects. The teachers had average competency in pre-planting operation with a 43% score. The table shows that Quality was also Assured (QA) in this area. According to the tam operations, showing that Quality was Not Assured (QNA) The overall score shows the percentage score of the teachers in the six major clusters of yam production with a 51% score indicating High Competency and that Quality was Assured (QA) in teaching yam production to the students.

**Research Question 2:** In what aspects of teaching Planning and Pre-planting Operations of yam productions are there Performance Gaps and where are Improvements Needed?

**4.2 Table 2:** Performance Gap Analysis & the Mean Ratings of the Perceived Improvements needed (IN) by teachers in teaching Planning and Pre-planting Operations of Yam production (N=28).

SN	Item Statements	$\bar{X}_N$	$X_P$	PG	Remarks
A) Planning for yam production enterprise					
1	Formulate specific objectives for the enterprise	3.72	1.73	1.99	IN
2	Revise the objectives periodically	3.22	1.63	1.59	“
3	Make a budget for the enterprise	3.8	1.99	1.81	“
4	Identify sources of finance for the yam enterprise	3.63	2	1.63	“
5	Identify materials and equipment for the enterprise	3.53	2.92	0.61	“
6	Draw a schedule of activities for the enterprise	3.66	2.1	1.56	“
7	Identify personnel for the enterprise	3.26	1.98	1.28	“
8	Select suitable land for the enterprise	3.01	2.06	0.95	“
9	Do a soil analysis test for suitability of the land	3.33	2.77	0.56	“
10	Select tools for farm land	2.86	1.31	1.55	“
11	Prepare selected tools for farm work	3.57	2.23	1.34	“
B) Pre-planting operations for yam production					
12	Clear the farm land for yam production	2.82	3.33	-0.51	INN
13	Pack dry weeds from the farm land	2.55	3	-0.45	“
14	Till the soil with appropriate tools.	3.74	3.02	0.72	IN
15	Fumigate the soil with appropriate fungicide before planting.				
16	Make ridges to specification	3.43	2.98	0.45	“
		3.22	3.33	-0.11	INN

**Key:**  $\bar{X}_N$  = Mean of Competencies Needed;  $\bar{X}_P$  = Mean of Teachers' Performance in the Competencies; PG= Performance Gap; IN=Improvement Needed; INN=. Improvement Not Needed.

Table 2 reveals that the Performance Gap (PG) of the teachers in teaching Planning shows that **Improvements were Needed (IN)** in teaching all the eleven aspects (**Formulating specific objectives for the enterprise; Revising the objectives periodically; Making a budget for the enterprise; Identifying sources of finance for the yam enterprise; Identifying materials and equipment for the enterprise; Drawing a schedule of activities for the enterprise; Identifying personnel for the enterprise; Selecting suitable land for the enterprise; Doing a soil analysis test for suitability of the land; Selecting tools for farm land and Preparing selected tools for farm work**) of teaching **Planning yam Production**, as they had positive value differentia in all the items. In teaching **Pre-Planting Operations** of yam production, the table shows that teachers Needed Improvements (IN) in teaching two aspects (**Tilling the soil with appropriate tools and Packing dry weeds from the farm land**) with positive value differentia while Improvements were Not Needed (INN) in teaching three aspects (**Clearing the farm land for yam production; Fumigating the soil with appropriate fungicide before planting and Making ridges to specifications** with negative value differentia

**Research Question 3:** In what aspects are there Performance Gaps in teaching planting and post planting operations of yam production and where are improvements needed?

**4.3. Table 3:** Performance Gap Analysis & Mean Ratings of the Perceived Improvements needed (IN) of Teachers in Teaching Planting and Post-planting Operations of Yam Production (N=28)

SN	Item Statements	$\bar{X}_N$	$\bar{X}_P$	PG	Remarks
<b>Planting operations for yam production</b>					
1	Select appropriate seedlings for planting	3.34	2.73	0.61	IN
2	Treat seedlings with appropriate chemicals	3.57	2	1.57	“
3	Secure seedlings against physical damage	3.75	2.43	1.32	“
4	Treat the face of the seedlings with appropriate fungicides	3.62	2.65	0.97	“
5	Plant yam to coincide with rainfall stability.	3.55	3.65	-0.1	INN
6	Prepare ridges of 1.2m width and 20m long	3	2.88	0.12	IN
7	Plant yam to maintain 1mx1m spacing	3.26	3.26	0	INN
<b>Post-Planting operations for yam production</b>					
8	Replace seedlings that failed to germinate.	3.82	3.22	0.6	IN
9	Spread mulch of 5-10cm layer to retain moisture	3.32	2.32	1	“
10	Weed the farm at regular intervals	2.97	2.33	0.64	“
11	Practice irrigation techniques according to demands	3.73	3.43	0.3	“

12	Drain soil water when occasion demands	2.77	1.61	1.16	“
13	Apply organic or inorganic manure to specification	2.55	2	0.55	“
14	Spray insecticides to check insect pests	3.74	1.42	2.32	“
15	Control rodents in the farm by trapping	3.47	2.33	1.14	“
16	Earthen up ridges according to demands	3.61	1.66	1.95	“

**Key:**  $\bar{X}_N$  = Mean of Competencies Needed;  $\bar{X}_P$  = Mean of Teachers' performance in the Competencies; PG= Performance Gap; IN=Improvement Needed; INN= Improvement Not Needed and N= Number of respondents.

Result in table 3 indicates that PG of the teachers in five out of seven aspects of planting Operations have positive values. This reveals that the teachers needed improvements in those aspects. The PG value for item seven was zero (0) showing that Improvement was Needed (IN) while that of item 5 recorded a negative value of -0.10 indicating that teachers of agriculture do Not Need Improvement (INN) in teaching those aspects. In general, the result showed that teachers Needed Improvement in most aspects (*Selecting appropriate seedlings for planting; Treating seedlings with appropriate chemicals; Treating seedlings with appropriate fungicides; Planting yam to coincide with rainfall stability; Preparing ridges of 1.2mand 20m long; Planting yam to maintain 1mx1m spacing; Selecting appropriate seedlings for planting; Treating seedlings with appropriate chemicals; Securing seedlings against physical damage; Treating the face of the seedlings with appropriate fungi; Preparing ridges of 1.2m width and 20m long*) of teaching **Planting Operations** and all aspects of (*Replacing seedlings that failed to germinate; Spreading mulch of 5-10cm layer to retain moisture; Weeding the farm at regular intervals; Practicing irrigation techniques according to demands; Draining soil water when occasion demands; Applying organic or inorganic manure to specification ; Spraying insecticides to check insect pests; Controlling rodents in the farm by trapping chemicals; Securing seedlings against physical damage; Earthen up ridges according to demands*) teaching **Post Planting Operations** of yam production

**Research Question 4:** In what aspects are there Performance Gaps in teaching Harvesting and Marketing Operations of yam production and where are improvements needed?

**4.4 Table 4:** Performance Gaps Analysis & Mean Ratings of Perceived Improvements needed (IN) of the Teachers Teaching Harvesting and Marketing Operations of Yam production (N=28)

SN	Item Statements	$\bar{X}_N$	$\bar{X}_P$	PG	Remarks
<b>Harvesting Operations</b>					
1	Select appropriate tools for harvesting of yam	3.34	2.11	1.23	IN
2	Harvest yam tubers when they are fully matured	3.45	2.8	0.65	“
3	Dig round the ridge to view the position of the tuber	3.78	2.82	0.96	“

5	Pull out mature yam tuber gently to avoid physical damage	2.99	3.32	-0.3	INN
6	Pack harvested tubers together without bruising them	3.09	3.09	0	“
7	Arrange harvested tubers according to sizes	3.71	2.65	1.06	IN
	Store harvested tubers in barns	3.22	3.11	0.11	“
<b>Marketing Operations</b>					
8	Advertise yam tubers to attract customers	3.44	1.47	1.97	“
9	Grade yam tubers and determine the prices	2.87	1.28	1.59	“
10	Open a sales book for sales made	3.04	2.02	1.02	“
12	Select buyers based on yam tuber size of their choice	3.22	2.11	1.11	“
13	Arrange for distribution of yam tubers to buyers	3.02	1.62	1.4	“
14	Balance farm account at the end of farming season to determine profit				
	Expand the size of yam farm based on profit made	3.82	2.51	1.31	“
15		3.55	2.11	1.44	“

**Key:**  $\bar{X}_N$  = Mean of Competencies Needed;  $\bar{X}_P$  = Mean of Teachers' performance in the Competencies; PG= Performance Gap; IN=Improvement Needed; INN= Improvement Not Needed and N= Number of respondents.

Table 4 indicates the PG and the needed areas of Improvements needed by the teachers in teaching Harvesting and Marketing Operations of Yam production. There are PG in five out of seven aspects of Harvesting Operations (**Selecting appropriate tools for harvesting of yam; Harvest yam tubers when they are fully matured; Digging round the ridge to view the position of the tuber; Arranging harvested tubers according to sizes and Storing harvested tubers in barns**) with positive values. The table reveals that the teachers Needed Improvements (IN) in those aspects. The PG value of the other two aspects (**Pulling out mature yam tuber gently to avoid physical damage; Packing harvested tubers together without bruising them**) have zero (0) and negative values respectively showing that Improvements were Needed (INN) in those aspects of teaching Harvesting Operations of Yam production. The table also shows that the PG value of all aspects of Marketing Operations have negative values indicating that the teachers Need Improvement (IN) in teaching all aspects of (**Advertising yam tubers to attract customers; Grading yam tubers and determine the prices; Opening a sales book for sales made; Selecting buyers based on yam tuber size of their choice; Arranging for distribution of yam tubers to buyers; Balancing farm account at the end of farming season to determine profit; Expanding the size of yam farm based on profit made**).

#### 4.5 Result of the Focus Group Discussion

#### 4.6 Summary of Findings

- 1) It was found that **Quality was Assured** in Planting; Pre-planting; Post-planting and Harvesting Operations aspects of teaching yam production; but **Quality was Not Assured** in Planning Activities; Pre-planting and Marketing Operations. It was also found that **Quality was Assured in the overall teaching of yam production** in the Colleges.
- 2) The teachers have **High Competencies** in teaching Planting; Post-planting and Harvesting Operations; **Average Competency** in teaching Pre-planting Operations and **Low Competency** in teaching Marketing. According to the table there is a **High Competency** in the Overall teaching of yam production operations.
- 3) **In teaching Planning Activities** of yam production enterprise **Performance Gaps were observed and Improvements were Needed** in;
  - Formulating specific objectives for the enterprise;
  - Revision of the objectives periodically;
  - Making budget for the enterprise;
  - Identifying sources of finance for the yam enterprise;
  - Identifying materials and equipment for the enterprise;
  - Drawing a schedule of activities for the enterprise;
  - Identifying personnel for the enterprise;
  - Selecting suitable land for the enterprise;
  - Doing a soil analysis test for suitability of the land;
  - Selecting tools for farm land;
  - Preparing selected tools for farm work.
- 4) In teaching Pre-planting operations of yam production Performance Gaps were observed and Improvements were Needed (IN) in:
  - Clearing of the farm land for yam production;
  - Packing dry weeds from the farm land and
  - Making ridges to specification**No Performance Gaps were found and Improvements were Not Needed (INN) in:**
  - Tilling of the soil with appropriate tools and
  - Fumigating of the soil with appropriate fungicide before planting.
- 5) In teaching **Planting Operations of yam production Performance Gaps were found and Improvement were Needed (IN) in:**
  - Selecting appropriate seedlings for planting;
  - Treating seedlings with appropriate chemicals;
  - Securing seedlings against physical damage;
  - Planting yam to coincide with rainfall stability;
  - Preparing ridges of 1.2m width and 20m long**No Performance Gaps were found and Improvement was Needed (INN) in:**
  - Plant yam to coincide with rainfall stability.
  - Plant yam to maintain 1mx1m spacing.
- 6) **In teaching Post-Planting Operations of yam production, Performance Gaps were found in all aspects and Improvements Needed (IN) in:**
  - Replacing seedlings that failed to germinate;
  - Spreading mulch of 5-10cm layer to retain moisture;
  - Weeding the farm at regular intervals;
  - Practicing irrigation techniques according to demands;

- Draining soil water when occasion demands;
- Applying organic or inorganic manure to specification;
- Spraying insecticides to check insect pests;
- Controlling rodents in the farm by trapping;
- Heartening up ridges according to demands;

7) In teaching **Harvesting Operations of Yam production, Performance Gaps were found in the following aspects and Improvements were needed (IN) in:**

- Selecting appropriate tools for harvesting of yam;
- Harvesting yam tubers when they are fully matured;
- Digging round the ridge to view the position of the tuber;
- Arranging harvested tubers according to sizes;
- Storing harvested tubers in barns WHILE;

**Performance Gaps were NOT found and No Improvement Needed (INN) in:**

- Pulling out mature yam tuber gently to avoid physical damage;
- Packing harvested tubers together without bruising them.
- In teaching **Marketing Operations** in yam production Performance Gaps were found and Improvements

**Needed (IN) in all aspect of;**

- Advertising yam tubers to attract customers;
- Grading yam tubers and determine the prices;
- Opening a sales book for sales made;
- Selecting buyers based on yam tuber size of their choice;
- Arranging for distribution of yam tubers to buyers;
- Balancing farm account at the end of farming season to determine profit;
- Expanding the size of yam farm based on profit made.

## 5. Discussion of Results

The results of this study revealed that Quality was Assured in teaching yam production by teachers of agriculture in Colleges of Education in Cross River State, Nigeria. This is probably because the teachers are competent in teaching most aspects of yam production except Marketing Operations where they have low competency. However they needed improvement (IN) in teaching most aspects of yam production enterprise due to lack of Performance Gaps. This result conforms with the findings of Olaitan, Amusa and Nwobu (2010) that carried out a study on quality assurance of instructors in teaching cocoyam production to students in Schools of Agriculture in South-western Nigeria. The authors found out that quality assurance of the instructors was average and that the instructors needed improvement in planning, post-planting, harvesting and marketing operations of cocoyam and needed competency in teaching cocoyam production to students. The result of this study is also in partial agreement with the findings of the study conducted by Dibio (2008) on requisite skills required by teachers of agriculture for improving the teaching of yam production in pre-planting operations, planting operations, processing and storage operations. The author identified the skills required at each stage of the operations in yam production but did not assess the competency levels of the teachers in these skill areas. The results of this study further agree with the

findings of the study conducted by Alawa, Abanyam and Okeme (2010) on competency improvement needs of teachers of Agriculture in a forestation for effective teaching in Secondary Schools in Cross River State, Nigeria where found out that teachers needed improvement in nursery, pre-planting, planting and post planting operations in a forestation to be effective in teaching the students. The result also agrees with the submission of Ogwo and Oranu (2006) that teachers must be continuous learners through improvement. The finding of Lack of Quality Assurance in teaching Marketing Operations is not very surprising as most teachers seem to emphasize the pedagogical aspects of the course at the expense of the technological and entrepreneurial aspects. This implies that teachers of agriculture must be retrained to ensure their effectiveness teaching all aspects of yam production. It is therefore not surprising that students seem to shy away from the practical aspects of agriculture thereby avoiding becoming professional crop producers but tend to prefer seeking for paid employment instead.

## 6. Conclusion

Although was found that Quality was Assured and the teachers have competencies in teaching yam production to College of Education students, improvements were needed in most aspects of the operation. It was therefore recommended that the Performance Gaps and Improvements Needed (IN) identified by this study be packaged and used to retrain teachers of Agriculture in order to make them meet the training needs of their students and adequately motivate their interest in the farming profession in addition to teaching junior secondary school students and primary school pupils thus, justifying the inclusion of agricultural education as an area of study in vocational education.

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