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Short Paper

Analysis of Utilization of Practical Agricultural Equipment/Tools in Colleges of Education in Enugu State, Nigeria

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Abstract

The study investigated the utilization of practical agricultural equipment/tools in colleges of education in Enugu State, Nigeria. Methods- Descriptive survey design was used for the study. Three objectives were stated for the study. The population of the study was 217 (162 NCE III students) and 55 lecturers of agriculture. All the population was used hence it is called consecutive or total enumerative sampling technique which is often used for better representation of the entire population. The instrument used for data collection was a 26 items questionnaire developed from the literature reviewed. Cronbach's Alpha analysis was used to determine the internal consistency of the instrument and a reliability coefficient of 0.86 was obtained. Two hundred and seventeen (217) questionnaires were administered and were retrieved and analyzed using mean and standard deviation. Findings from the study revealed that lecturers were found

incompetent or incapable of utilizing most tools and equipment during practical agriculture in their colleges. It was recommended amongst others that workshops should be organized for lecturers by college management to train lecturers on the use of various tools and equipment as recommended by the National Commission for Colleges of Education (NCCE). It was concluded that there were inconsistencies in the implementation process which leads to incompetency on the part of lecturers in the utilization of this equipment in the course of teaching. This could improve student's skills in the course of learning and after graduation. The study recommends amongst others that Stakeholders in the education sector should make an available fund for the purchase of these tools and equipment for use by lecturers and organize training and workshop for lecturers and students. The study had revealed that if lecturers are properly trained in the use of these tools and equipment, they stand a better chance to impart the knowledge and skills to students who will in turn be competent in an agric-preneurial enterprise. This implies that small and medium scale industries in agriculture will thrive in the economy.

Keywords – implementation, practical agriculture

INTRODUCTION

The school curriculum is a dynamic and oscillating document that changes under the needs and aspirations of society. Advanced countries in Europe and America had long ago, modified their curriculum to address issues of value re-orientation, poverty eradication, critical thinking, entrepreneurship, and life vocational skills. The quest by any country for national development must consider the implementation of a modified curriculum to serve the current socio-economic and political needs of her citizens. Curriculum as used in this study is the sequence of activities organized by the school under the supervision of competent lecturers for the training of individuals. Ekele (2019) affirms that the implementation of the curriculum depends on the quality of lecturer in the educational sector who are the critical factor in the implementation process. Lecturers themselves must have a proper grasp of the entire curriculum of study before delving into the implementation of a practical agriculture curriculum.

Agbulu and Ekele (2004) explained that lecturers of agriculture based on the minimum standard requirement as stated by the National Commission for Colleges of Education (2009) are an academic staff that should possess a minimum of Bachelor's Degree of second class honour division. Thus, the use of agricultural pieces of equipment for teaching and learning of students demands mastery and competence. As reported by World Meteorological Organization (2001), utilization of equipment by lecturers and students are an important part of skills and proficiency that should be possessed by them, where it becomes obvious that these skills are lacking, knowledge gain is seriously compromised. Effectiveness is the knowledge and ability a lecturer or student demonstrates in the course of utilization of these pieces of equipment/tools in a particular setting at a given task measured against preset known standards of accuracy,

completeness, cost, and speed in practical agriculture. The rate of student skill acquisition is determined by the extent to which the student accomplishes a given task in the use of meteorological, survey, or fishery tools and equipment. To perform is to take a complex series of actions that integrate skills and knowledge to produce a valuable result. The information provided by this study will help the management teams of the various colleges of education to know the extent lecturers utilize practical agriculture pieces of equipment/tools in their colleges. It will also expose the rate at which lecturers implement the curriculum of practical agriculture in addition to the theoretical aspect of agriculture. The ministry of education will find the result of this study significant as it will form the basis upon which subsequent study will be carried out in the aspect of the utilization of tools and equipment for practical agriculture

Utilization of agricultural equipment as stipulated by the regulatory body is a crucial process that requires coordinated efforts from college administrators including lecturers of agriculture and other stakeholders. Federal Republic of Nigeria (2013) states that effective utilization of this equipment apart from being a product of providing adequate teaching and learning requires that learners learn by doing by having access to all the relevant resources. The agricultural learning resources necessary for effective teaching include workshop or agricultural laboratory, farm store, farm tools and equipment, school farm, books, agriculture videos, and irrigation equipment (Kyule, Konyango & Nkurumwa, 2018).

One of the expected outcomes of practical agriculture implementation in colleges of education is to inculcate relevant skills that could enable a student to be integrated into relevant agricultural activities on the school farm. Probably, the utilization of practical agriculture equipment and facilities in the college of education has fallen short of expectations. They could be attributed to inadequate integration of the agricultural activities. This may be one of the possible reasons for low interest exhibited by both lecturers and students in the utilization of these pieces of equipment and tools. In the school farm for example, where rainfall and dew are measured using equipment such as rain gauge, Steven and James (2012) points out that the amount of precipitation, rain, snow, ice, and dew which reaches the ground in a stated period is expressed as the depth to which it would cover a horizontal surface if there were no loss by evaporation, run-off or infiltration. The amount of precipitation is measured in millimeters.

Ordinary rain gauge usually has the form of a collector above a funnel into a receiver. The lecturers may find the above procedural description difficult to demonstrate to students. Murthy et al. (2018) reported that in some European countries, Meteobot is used which is a system of high-quality sensors, which measures the local weather conditions with precision and needs no calibration. Meteobot calculates the hours when the leaves have been wet, the wind speed, measures the temperature continually, and shows the trending of decreasing or increasing soil moisture sensors. This is not in use in most African countries and may require extensive training for lecturers for it to be introduced.

Some studies such as Karemera (2003) found that students' performance in terms of skills acquired from practical activities is significantly correlated with satisfaction with the academic environment and service received. Although, other factors such as class,

attendance financial status, and effects of the previous GPA affects students' performance in agriculture economics as reported by Devadoss and Foltz (1996). It could be inferred from the context of this study that lack of resources and trained teachers for proper teaching and learning of practical agriculture may lead to a low performance by students in the study area. It is indisputable that the highest qualities of lecturers, those most capable of helping their students learn, have deep mastery of their subject matter and pedagogy (Mobegi, Ondigid & Obum, 2010). The study by Nzoka and Oradho (2014) reported their verdict on whether management strategies were effective in enhancing students' academic performance based on practical activities and the verdict showed the ineffectiveness of these strategies. It was thus apparent that the academic qualification of lecturers and experience were not enough to jerk-up students' skill mastery on practical activities in the absence of resources required for practical agriculture. In this regard, Kudari (2016) and David (2014) in their findings gave credence to the fact that the provision of resources especially practical equipment for science subjects and agriculture are important in enhancing task mastery in practical agriculture.

Preliminary investigation by the researchers on the seemingly poor teaching by lecturers and poor learning on the part of the students in practical agriculture in the study area revealed that students are not willing to indict or vindicate lecturers as to their inability to use the equipment meant for agriculture practical on the school farm. Lecturers, on the other hand, claimed to have done their best within the available resources to teach the students. Based on this premise, it becomes urgent to investigate the analysis of the utilization of practical agriculture equipment in colleges of education in Enugu State, Nigeria. Specifically, the study determines the:

1. lecturer ability in the utilization of soil/ meteorological tools used for practical agriculture,
2. lecturer competence in the use of survey equipment for practical agriculture, and
3. lecturer capacity in the use of fishery equipment.

METHODS

The study adopted a descriptive survey research design. The study was carried out in Enugu State, Nigeria. The population of the study was 217 consisting of 162 NCE III students of the two colleges of education in Enugu State and 55 lecturers of agriculture in these colleges (Field survey, 2019). The entire population was used, hence, consecutive or total enumerative sampling was adopted. This is because it is a type of non-probability sampling technique that is often used for better representation of the entire population and to assist in gaining the maximum number of respondents. A 26-items questionnaire titled "implementation of Practical Agriculture Questionnaire" (IPAQ) was developed by the researchers from the literature reviewed and used for data collection. The instrument was validated by three experts one each from the agricultural education, soil, and fishery Departments of the University of Agriculture, Makurdi-Benue State.

The response options of all research questions are Highly Utilized (HU), Moderately Utilized (MU), Slightly Utilized (SU), and Not Utilized (NU) with corresponding numerical

values of 4, 3, 2, and 1, respectively. Cronbach's alpha analysis was used to determine the internal consistency of the instrument. A reliability coefficient of 0.86 was obtained that indicated good internal consistency of the IPAQ. Two hundred and seventeen (217) copies of the questionnaire (survey forms) were administered to the respondents and were retrieved and analyzed using weighted mean and standard deviation. The real limit of numbers was used to arrive at the decision. 2.50 and above of any item mean was regarded as HU, or MU, and below 2.50 of any item mean was regarded as Slightly Utilized (SU) or Not Utilized (NU).

RESULTS

Results from Table 1 revealed that respondents rated five (5) meteorological tools as not utilized by lecturers. This is shown in the mean ratings of these tools (items 1,2,7,8 and 9) and had a mean lower than 2.50. Conversely, respondents rated items 3,4,5,6 and10 highly Utilized (their mean rating is above 2.50). This indicates that lecturers utilized these tools in their practical activities.

Table 1. Mean and Standard Deviation of Respondents on Lecturers' Ability in Utilization of Soil/meteorological tools used for Practical (N=217)

S/N	Tools/equipment	$\bar{x}$	STD	Remarks
1	Stevenson's screen	2.42	.52	NU
2	Thermohydrographs	2.11	.60	NU
3	Max. and min. thermometers	3.64	.66	HU
4	Rain Guage	3.60	63	HU
5	Measuring glasses	3.05	.57	HU
6	Wind vane	3.80	.56	HU
7	Anemometer	2.16	.55	NU
8	Evaporometer	2.27	.50	NU
9	Hygrometers	2.06	.61	NU
10	Barometers	3.30	.77	HU

Keys: *HU - Highly Utilized; NU - Not Utilized, $\bar{x}$= mean of respondents; STD: Standard Deviation of respondents.*

Table 2. Mean and Standard Deviation of Respondents of Lecturers in the Use of Survey Equipment for Soil Science Practical (N= 217)

S/N	Tools/equipment	$\bar{x}$	STD	Remarks
1	Prismatic compass	2.70	.57	HU
2	Ranging poles	3.48	.69	HU
3	Chain (grunters & surveyors)	2.05	.59	NU
4	Planimeter	2.33	.74	NU
5	Theodolite and staff	2.40	.70	NU
6	Pantograph	3.56	1.03	HU
7	Stereoscope	2.20	1.160	NU
8	Set of arrows	3.80	.16	HU

Keys: *HU - Highly Utilized; NU - Not Utilized, $\bar{x}$= mean of respondents; STD: Standard Deviation of respondents.*

Analysis of Table 2 revealed that the four equipment (items) had their mean rated below 2.50 by respondents (chain grunters & surveyors), planimeter, theodolite, and staff and stereoscope. This indicates that this equipment was not utilized by lecturers (lecturers are not competent in their utilization for practical). This is because most of these lecturers are not capable of using or operating the equipment and hence they are not competent. However, equipment like a prismatic compass, ranging poles, pantograph, and set of arrows were rated above 2.50 by the respondent which indicates competency in their utilizations.

Analysis of Table 3 revealed that respondents rated equipment 1-5 as highly utilized by lecturers as shown by their mean which ranges from 2.86 to 3.40. Equipment 6 to 8 has means which ranges from 1.87 to 2.00 and which further indicates that they are not being utilized by lecturers during practical learning activities/session

Table 3. Mean and Standard Deviation of Respondents on Lecturer's ability in the use of Fishery Equipment (N= 217)

S/N	Tools/equipment	$\bar{x}$	STD	Remarks
1	Hook	2.86	.62	HU
2	Line	2.69	.55	HU
3	Sinker	2.80	.74	HU
4	Scoop nets	2.97	.80	HU
5	Cast nets	3.40	.51	HU
6	Float lead	2.00	.47	NU
7	Gillnets	2.32	.54	NU
8	Fishing boat	1.87	.73	NU

Keys: *HU - Highly Utilized; NU - Not Utilized,* $\bar{x}$ *= mean of respondents; STD: Standard Deviation of respondents.*

DISCUSSION OF RESULTS

Findings from Table 1 revealed that lecturers utilized some of the meteorological tools/equipment during practical learning activities (these equipment are maximum and minimum thermometer, rain gauge, measuring glasses, wind vane, and barometers). The finding aligned with the findings of Murthy et al. (2018) who in their study confirmed that lecturers or teachers of agriculture are in the position to effectively use meteorological equipment in the teaching and learning of practical agriculture. The skills possessed by lecturers are transferred to students in the course of lessons and activities in the school farm or class. Ananga (2010) further supported the findings from Table 1 by concluding that the use of equipment motivates students to achieve a clearer understanding of concepts being taught by the teacher. Findings from Table 2 which revealed that lecturers were found incompetent (because the lecturers do not know how to operate or use the equipment available during practical lessons) and did not use some survey equipment (chain gunters and surveyors, planimeter, theodolite and staff, and stereoscope) agreed with the study by Sindale and Dlamini (2013). The authors affirmed that inconsistent use of this equipment may lead to the absence of skills when needed on the job. It is equally

important to note here that the empirical evidence here is the mean rating which showed not utilized by respondents. Conversely, the finding from Table 2 which revealed that some of the equipment was highly utilized for practical was in line with the findings of Kyule et al. (2018) when they reported that the use of equipment by teachers in practical agriculture curriculum in Kenya's arid and semi-arid secondary schools results in high performance of students. Findings from Table 3 that lecturers were capable of using most fishery equipment corroborates the findings of Puyate (2012) who submitted that students' ability to practice increases as obstacles to learning are reduced via constant use of practical equipment which further reduces constraints to effective implementation of practical agriculture. This finding is also in line with emphasis the Federal Republic of Nigeria (2013) placed on the need for students and teachers to acquire skills in vocational course for self- reliance

CONCLUSION

The thrust of this study was to reach a verdict on analysis in the implementation of practical agriculture curriculum in the colleges of education for scaling-up students' performance. The result of the findings reported in this study has reached a verdict that some of the equipment in meteorology /soil science, survey, and fishery equipment were not utilized by lecturers in the course of practical agriculture which had lead to poor performance by students. It was apparent that practical agriculture showed greater understanding on the part of students and enhanced the implementation of practical agriculture in the colleges studied. Although there were inconsistencies in the implementation process, the vocational guidance of students by lecturers had reduced the tendency to ignore the use of this equipment.

RECOMMENDATIONS

Workshops should be organized for lecturers by college management to train lecturers on the use of the various tools and equipment. The acquisition of these training skills by lecturers will translate to scaling up student performance. Upon graduation, students could equally be self-reliant having acquired these skills from their lecturers. Stakeholders in the education sector should make available funds for the purchase of these tools and equipment for use by students and lecturers. Furthermore, it is recommended that subsequent researchers investigate the use of individual equipment or tools with regards to how their utilization impact student learning under unfavorable condition.

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