Assessment of Availability and Utilization of Laboratory Equipment for Teaching Food and Nutrition in Nigerian Universities

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Abstract
This paper assessed the availability and utilization of laboratory equipment for teaching Food and Nutrition in Nigerian Universities. Three research questions guided the study. Employing a descriptive survey design, all 68 Home Economics lecturers from four public universities in the South-South and South-East geopolitical zones were purposively sampled. The instrument use for data collection was a structured questionnaire. The questionnaire contained 130 items on availability and utilization of laboratory equipment and 10 items on the challenges faced by lecturers in utilizing the available material resources for effective teaching Food and Nutrition in the Universities. The instrument was face validated by three experts, and the reliability coefficient was established using Cronbach Alpha statistics which yielded a coefficient of 0.96, 0.94 and 0.88. Data collected through questionnaire was analyzed using percentages and frequency counts. The study revealed inadequate availability and utilization of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria. Based on the findings of the study, the researchers recommended among others that government at all levels should provide adequate laboratory equipment and train lecturers on the utilization of Food and Nutrition laboratory equipment as well as ensure proper monitoring and supervision of the Universities to ensure that the laboratory equipment available are adequately utilized and maintained.

Keywords: Universities, Nigeria, Laboratory Equipment, Food, Nutrition

Introduction

In the past, Home Economics was a subject primarily taught to girls, focusing on homemaking skills such as cooking, sewing, and childcare. Today, it has evolved into a multi-disciplinary field offered at various educational levels worldwide (Eze, 2022). According to Nwankwo (2009), Ogbonnaya, et al., (2022) Home Economics is inter-disciplinary, multi-

disciplinary and trans-disciplinary field of knowledge with numerous saleable skills which make for self-employment and self-reliance. The philosophy of Home Economics in Nigeria is aimed at preparing the individual for home making and family life; nurturing and fostering physical development and wellbeing of the family, community, nations and institution (Eze, 2022). This philosophy of Home Economics in Nigeria provides the basis for the formulation of the objectives. The objectives of the programme are to train students with entrepreneurial skills in Home Economics for self-reliance, gainful employment and ability to work effectively in a team from diverse professional and socio-cultural background. In Nigerian educational system according to FRN (2013), Owo and Deebom (2020), universities offer Home Economics programmes for the award of Bachelor of Science in Education (B.Sc Ed.) in Home Economics to students in broad areas of specialization such as Clothing and Textiles, Food and Nutrition and Home Management for the purpose of promoting the inculcation of requisite theoretical knowledge as well as practical skills in the students for increased productivity and sustainability upon graduation.

Food and Nutrition aspect of Home Economics education imparts knowledge of healthy eating through practical activities, offering skills for self-reliance and entrepreneurship (Usman, 2012; Lips & Kikkull, 2017). Laboratory experiences are essential in Home Economics education, enabling students to translate theoretical knowledge into practical skills. In the view of Etiubon (2018), with the laboratory experience, students will be able to translate their theoretical knowledge to practical realities, thereby enhancing a better understanding of the concepts learnt. To achieve this, adequate laboratory instructional facilities and equipment are needed in public schools to reduce the burden of science teachers and to promote sensory receptors of the learners (Anyadiegwu, 2018). Ogbonnaya, et al., (2022), defined laboratory as a controlled environment where scientific, experiments, research, and testing involving students in activities such as observing, counting, measuring, experimenting, recording and carrying out fieldwork.

The availability of laboratory equipment in education enhances learning effectiveness and acquisition of lifelong skills for lifelong development (Kofo, 2012). In the view of Ohwovoriole, and Ochonogor (2008), Home Economics education is a functional education, which needs adequate supply of training materials and equipment for skill acquisition. With adequate practical work in Home Economics, students will be competent to face economic challenges and survive in the existing unemployment situations (Olukanni, Aderonmu & Akinwumi, 2014; Ogbonnaya, et al., 2022). This can only be done through availability and adequate utilization of the Home Economics laboratory equipment as an integral part of the instructional process adopted by teachers (Ogbonnaya, et al., 2022). Availability and utilization of laboratory equipment to a large extent makes learning meaningful and a necessity for a successful implementation of the Home Economics curriculum. In the view of Asogwa (2013), availability refers to the condition of being obtainable or handy at a particular point in time. In the context of this study, the material resources can be said to be available when they are up-to-date, in good condition and within the reach of the lecturers for maximum utilization. When the available material resources are not efficiently utilized, teaching would relatively become ineffective. Utilization of laboratory equipment is simply the frequency with which the available laboratory facilities are utilized during laboratory experiments (Etiubon, & Udoh, 2020). It is noted that availability and utilization of tools and equipment in laboratory affect the teaching of practical subjects (Uwameiye, 2016).

According to Adebisi, Tewogbade, and Olajide (2017), Nigerian institutions often lack sufficient laboratory equipment for effective skill acquisition. In the view of Mbaga, Sambo and Tijjani (2018), physical facilities, such as equipment, hand tools, and machines available

in Nigerian institutions, were not enough to cater for the population of students enrolled in Nigerian educational system. Physical facilities such as lecture halls, laboratories and workshops were not adequate for TVET programmes due to insufficiency of funds (Akinfolarin, Ajayi & Oloruntegbe, 2012). The reasons for the alarming rates of social problems may be that facilities in the schools for students' skills acquisition are inadequately provided and rarely utilized (Edokpolor, 2018). As noted by Eze (2013), lack of adequate provision of laboratory equipment, remuneration and rewards from the government, reduce the enthusiasm and commitment of lecturers in utilization of laboratory equipment. Considering the potentials of Food and Nutrition in Home Economics, it is essential to assess its availability and utilization of laboratory equipment in Nigerian Universities. Hence, this study focuses on assessing laboratory equipment availability and utilization for Food and Nutrition instruction in Universities in South-South and South-East geopolitical zone in Nigeria.

Statement of the Problem

Effective teaching relies on laboratory equipment availability and utilization. Inadequate access and underutilization of these resources can lead to the production of unskilled graduates ill-equipped for global competition and contributing to unemployment (Eze, 2013). According to Mbaga, Sambo and Tijjani (2018) insufficient funding has resulted in outdated or insufficient laboratory equipment in Nigerian universities for effective teaching and where facilities exist, they are obsolete which has contributed to a declining quality of Home Economics education graduates in Nigeria. Therefore, considering the potential of laboratory equipment in the study of Food and Nutrition, it therefore becomes significant to evaluate the availability, utilization, and challenges of laboratory equipment in teaching Food and Nutrition within Nigerian universities, particularly in the South-South and South-East regions.

Purpose of the Study

The main purpose of this study was to determine the availability and utilization of laboratory equipment for teaching food and nutrition in Universities in South-South and South-East geopolitical zone in Nigeria. Specifically, this study sought to determine the:

1. Availability of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria.
2. Utilization of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria.
3. Challenges encountered by lecturers in utilizing laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria.

Research Questions

The following questions were asked to guide the study:

1. What are the available laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?
2. Are the available laboratory equipment utilized by the lecturers for effective teaching of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?
3. What are the challenges faced by lecturers in utilizing the available material resources for effective teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?

Related Literature

Numerous studies have explored the availability and utilization of laboratory resources and equipment in teaching and learning Food and Nutrition in Home Economics Education. Considering the study conducted by Ogbonnaya, et al., (2022) which focused on the utilization of Home Economics laboratory equipment in teaching Senior Secondary School students within the Udenu Local Government Area of Enugu State. The study employed a descriptive survey research design. Three objectives and three research questions were used for the study. The population of the study was 48 Home Economics teachers. The entire population was used for the study. The instrument for data collection was a questionnaire and data collected were analyzed using mean and standard deviation.

The study's outcomes highlighted the inadequacy of available tools and equipment in Home Economics Laboratories. It identified 15 specific issues faced by Home Economics teachers when using laboratory equipment to teach the subject. The study's recommendations centered on the necessity for school administrations to provide sufficient laboratory tools and equipment to sustain consistent practical activities. Additionally, the Vocational and Technical Education Board was requested to organize regular in-service training for Home Economics teachers to enhance their proficiency in utilizing laboratory equipment.

Similarly, another study Edokpolor (2018) evaluated the adequacy of physical facilities and the utilization of instructional resources in Technical and Vocational Education and Training (TVET) programs. A quantitative research design was used, with a sample of 700 participants (85 lecturers and 615 students), selected at random. Structured questionnaires were employed to gather data from TVET lecturers and students. Mean, standard deviation, and t-test were used for data analysis. The study revealed that physical facilities were insufficiently provided and underutilized for effective teaching and learning within TVET programs. One of the recommendations proposed addressing this issue by collaborating with stakeholders to secure funds for enhancing the provision of physical facilities.

A study conducted Akpan, Ekong and George (2023), assessed the availability of practical facilities for implementing the TVET curriculum in Technical Colleges in Akwa Ibom State. The study's sample consisted of 140 teachers selected from a population of 196 within seven public Technical Colleges. Data was collected using a 60-item questionnaire with a 4-point rating scale. Mean, standard deviation, and independence t-test were used for analysis. The study revealed insufficient practical facilities for implementing the TVET curriculum in these colleges. Effective strategies were pinpointed as the provision of adequate practical facilities and their utilization for teaching and learning.

In a related study by Etiubon and Udoh (2020), the availability and utilization of laboratory facilities for teaching carbohydrates in Senior Secondary Schools within Uyo Education Zone were examined using a descriptive survey research design. The study's sample included 215 biology and chemistry teachers selected from a population of 218 in the 2018/2019 academic session. The data collection method was structured questionnaires, employing purposive sampling. The study's findings indicated that although a limited number of laboratory facilities were present, they were seldom utilized by biology and chemistry teachers.

Furthermore, another research by Uwameiye (2016), delved into the accessibility and utilization of tools and equipment for teaching garment making in senior secondary schools in Edo State, Nigeria. This descriptive survey study involved 72 teachers and 345 students. Data were collected through structured questionnaires and analyzed using simple percentages and mean t-tests. The study revealed that the available tools and materials for teaching garment

making in Senior Secondary Schools were significantly insufficient and not effectively utilized for instructional purposes.

Methods and Material Used

This section outlines the research methodology employed in the current study, which focuses on the design of the study, area of the study, population of the study, validation of the instrument, reliability of the instrument, method of data collection, method of data analysis and decision rule used in the study.

Area and Design of the Study

The study was carried out in Universities in South-South and South-East geopolitical zone in Nigeria. The study adopted a descriptive survey research design, aiming to systematically collect and describe data regarding the characteristics and features of laboratory resources about a given population (Nworgu, 2023).

Population and Sampling Techniques

The target population comprised of Home Economics lecturers from Universities in the South-South and South-East geopolitical zones of Nigeria. A purposive sampling technique was used to select all 68 lecturers in four Universities in the study area.

Data Sources

The paper explored scholarly works on availability and utilization of tools and equipment for teaching and learning. The data were gotten from both primary and secondary sources. The primary data were obtained from a questionnaire. The Information from respondents was gathered using a structured questionnaire. Secondary data are data obtained from existing or published articles. The researchers used Internet publications, journals, documented reports, and Internet material as the secondary source.

Data Collection Instrument

Data for the study was collected through a structured questionnaire titled: Availability and Utilization of Laboratory Equipment for Teaching Food and Nutrition in Universities in Nigeria (AULETFNUN). The questionnaire has Part A and B with sixty five (65) items each on availability and utilization of laboratory equipment while part C has ten (10) items on the challenges faced by lecturers in utilizing the available material resources for effective teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria. The instrument was face validated by one expert from the Department of Home Economics, Abia State University and two experts from the Department of Measurement and Evaluation, University of Nigeria, Nsukka, Anambra State. The experts after examining the instrument, made some corrections which were effected from the experts opinion.

In order to ensure the reliability of instrument, five lecturers were trial tested in the Abia State University and University of Nigeria, Nsukka, Anambra State who were not part of the area of study. The data collected were analyzed using Cronbach Alpha statistics. The internal consistency of the instrument was obtained as: Section A = 0.96; Section B = 0.94; Section C = 0.88. These reliability co-efficient values were considered appropriate for the study.

Method of Data Analysis

The researchers administered the instrument directly to the respondents in the universities with the help of three research assistants who were instructed on what is required. The instrument was collected immediately after completion and yielded 98% return rate. Data

collected through questionnaire was analyzed using percentages and frequency counts. The decision rule on the checklist for research question 1 and 2 was Highly Available (HA), Moderately Available (MA), Lowly Available (LA) and Not Available (NA) while decisions of the respondents on the research question 3 were based on Strongly Agreed (SA), Moderately Agreed (MA), Lowly Agreed (LA) and Not Agreed (NA) options.

Results and Discussion

Research Question 1: What are the available laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?

Table 1: Availability of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria

S/N	Laboratory Equipment for Teaching Food and Nutrition	Highly Available (HA)		Moderately Available (MA)		Lowly Available (LA)		Not Available (NA)		Dec.
		Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	
1.	Tripod stand	4	5.88	23	33.8	36	52.9	5	7.35	LA
2.	Charcoal Stoves	7	10.3	18	26.5	39	57.4	7	10.3	LA
3.	Kerosene Stove	3	4.41	35	51.5	13	19.1	17	25.0	MA
4.	Gas range	6	8.82	22	32.4	38	55.9	2	2.94	LA
5.	Electric range	9	13.2	24	35.3	33	48.5	2	2.94	LA
6.	Weighing Scales	2	2.94	16	23.53	37	54.4	13	19.1	LA
7.	Saltant weighing scales	5	7.35	19	27.9	39	57.4	5	7.35	LA
8.	Dish washer	1	1.47	31	45.6	23	33.8	13	19.1	MA
9.	Deep fat fryer	4	5.88	22	32.4	35	51.5	7	10.3	LA
10.	Clay pots (large and small)	6	8.82	36	52.9	19	27.9	7	10.3	MA
11.	plastic basin for water storage	3	4.41	41	60.3	23	33.8	10	14.7	MA
12.	Kerosene/gas refrigerator	8	11.7	23	33.8	34	50.0	3	4.41	LA
13.	Electric refrigerator	3	4.41	24	35.3	33	48.5	8	11.7	LA
14.	Electric freezer	6	8.82	22	32.4	39	57.4	1	1.47	LA
15.	Sinks	5	7.35	37	54.4	26	38.2	-	-	MA
16.	Built-in cabinets or cupboards	3	4.41	25	36.8	37	54.4	3	4.41	LA
17.	Wall cabinets	6	8.82	22	32.4	34	50.0	6	8.82	LA
18.	Dustbins	8	11.7	36	52.9	18	22.1	4	5.88	MA
19.	Brooms (short and long)	3	4.41	43	63.2	19	27.9	3	4.41	MA
20.	Mops and mop buckets	6	8.82	41	60.3	16	23-5	5	7.35	MA
21.	Micro-wave oven	7	10.3	24	35.3	31	50.0	6	8.82	LA
22.	Aluminum pots (different sizes)	4	5.88	24	35.3	35	51.5	5	7.35	LA
23.	Aluminum pans (different sizes)	7	10.3	12	17.6	40	58.8	9	13.2	LA
24.	Double boilers	6	8.82	16	23.5	43	63.2	3	4.41	LA
25.	Pressure cookers	3	4.41	25	36.8	36	52.9	4	5.88	LA
26.	Baking trays of various sizes	4	5.88	19	27.9	39	57.4	6	8.82	LA
27.	Serving trays	9	13.2	21	30.9	32	47.1	6	8.82	LA
28.	Portable electric appliances	6	8.82	11	16.2	41	60.3	10	14.7	LA
29.	Grinding stones	6	8.82	23	33.8	35	51.5	4	5.88	LA
30.	Pestle and Mortar	3	4.41	12	17.6	44	64.7	9	13.2	LA
31.	Frying pans	7	10.3	37	54.4	24	35.3	-	-	MA
32.	Mixing bowls	5	7.35	42	61.8	13	19.1	13	19.1	MA
33.	Serving dishes and casserole dishes	8	11.7	33	48.5	24	35.3	3	4.41	MA
34.	Serving plates	4	5.88	36	52.9	21	30.9	7	10.3	MA
35.	Egg whisk and beater	3	4.41	30	44.1	26	38.2	9	13.2	MA
36.	Sieves	7	10.3	31	45.6	30	44.1	-	-	MA
37.	Basins (enamel, metals or plastics)	8	11.7	34	50.0	27	39.7	-	-	MA

38.	Teaspoons	3	4.41	39	57.4	18	26.5	8	11.7	MA
39.	Dessertspoons	5	7.35	31	45.6	24	35.3	8	11.7	MA
40.	Frying spoons	7	10.3	22	32.4	38	55.9	3	4.41	LA
41.	Serving spoons	4	5.88	35	51.5	26	38.2	3	4.41	MA
42.	Table forks	8	11.7	21	30.9	37	54.4	2	2.94	LA
43.	Serving spoons	3	4.41	23	33.8	41	60.3	1	1.47	LA
44.	Table forks	6	8.82	12	17.6	46	67.6	4	5.88	LA
45.	Frying forks	8	11.7	37	54.4	22	32.4	1	1.47	MA
46.	Desserts forks	4	5.88	24	35.3	36	52.9	4	5.88	LA
47.	Paring knives and spoons	5	7.35	35	51.5	28	41.2	-	-	MA
48.	Colanders (metals or plastic)	3	4.41	20	29.4	37	54.4	8	11.7	LA
49.	Palette knives	3	4.41	33	48.5	21	30.9	11	16.2	MA
50.	Icing sets	5	7.35	38	55.9	25	36.8	-	-	MA
51.	Bread knives.	5	7.35	42	61.8	11	16.2	10	14.7	MA
52.	Spatulas	7	10.3	44	64.7	17	25.0	-	-	MA
53.	Wooden spoons	8	11.7	40	58.8	14	20.6	6	8.82	MA
54.	Rolling pins	7	10.3	21	30.9	33	48.5	7	10.3	LA
55.	Calabashes	4	5.88	26	38.2	30	44.1	8	11.7	LA
56.	Pastry and chopping boards	7	10.3	41	60.3	17	25.0	3	4.41	MA
57.	Roasting pan	3	4.41	44	67.7	13	19.1	8	11.7	MA
58.	Tea Pot	6	8.82	25	36.8	36	52.9	1	1.47	LA
59.	Manual grinder	5	7.35	37	54.4	26	38.2	-	-	MA
60.	Tray	2	2.94	30	44.1	23	33.8	13	19.1	MA
61.	Kitchen cloth	7	10.3	43	63.2	18	26.5	-	-	MA
62.	Drinking glasses	5	7.35	44	64.7	19	27.9	-	-	MA
63.	Steamers	7	10.3	41	60.2	17	25.0	3	4.41	MA
64.	Electric water purifiers	9	13.2	33	48.5	24	35.3	2	2.94	MA
65.	Micro-wave oven	4	5.88	26	38.2	32	47.1	5	7.35	LA

Source: Fieldwork 2023

The data presented in Table 1 reveals that laboratory equipment such as Kerosene Stove, Clay pots, plastic basin for water storage, Sinks, Dustbins, Brooms, Mops and mop buckets, Serving tables and chairs/stool, Frying pans, Mixing bowls, Serving dishes and casserole dishes, Serving plates, Egg whisk and beater, Sieves, Basins, Teaspoons, Dessertspoons and forks, Frying spoons and forks, Paring knives and spoons, Icing sets, Bread knives, Spatulas, Wooden spoons, Pastry and chopping boards, Roasting pan, Tea Pot, Manual grinder, Tray, Kitchen cloth, Drinking glasses, Serving spoons, and Steamers were moderately available for teaching Food and Nutrition in universities within the South-South and South-East geopolitical zones of Nigeria. On the other hand, several other laboratory equipment was found to be lowly available for the same purpose. This indicates that there were 32 items with low availability and 33 items with moderate availability, collectively indicating a moderate availability of laboratory equipment for teaching and learning Food and Nutrition in the universities.

Research Question 2: Are the available laboratory equipment utilized by the lecturers for effective teaching of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?

Table 2: Utilization of laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria

S/N	Laboratory Equipment for Teaching Food and Nutrition	Highly Utilization (HU)		Moderately Utilization (MU)		Lowly Utilization (LU)		Not Utilization (NU)		Dec.
		Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	
1.	Tripod stand	6	8.82	9	13.2	38	55.9	15	22.1	LU
2.	Charcoal Stoves	3	4.41	11	16.2	31	45.6	23	33.8	LU
3.	Kerosene Stove	7	10.3	33	48.5	24	35.3	4	5.88	MU
4.	Gas range	6	8.82	15	22.1	31	45.6	16	23.5	LU
5.	Electric range	3	4.41	17	25.0	29	42.6	19	27.9	LU
6.	Weighing Scales	7	10.3	4	5.88	35	51.5	22	32.4	LU
7.	Saltant weighing scales	8	11.7	12	17.6	38	55.9	14	20.6	LU
8.	Dish washer	4	5.88	34	50.0	26	38.2	4	5.88	MU
9.	Deep fat fryer	3	4.41	3	4.41	38	55.9	24	35.3	LU
10.	Clay pots (large and small)	7	10.3	32	47.1	22	32.4	7	10.3	MU
11.	Plastic basin for water storage	6	8.82	37	54.4	20	29.4	5	7.35	MU
12.	Kerosene/gas refrigerator	7	10.3	10	14.7	36	52.9	15	22.1	LU
13.	Electric refrigerator	5	7.35	13	19.1	28	41.2	22	32.4	LU
14.	Electric freezer	3	4.41	4	5.88	36	52.9	25	36.8	LU
15.	Sinks	7	10.3	43	63.2	17	25.0	1	1.47	MU
16.	Built-in cabinets or cupboards	9	13.2	6	8.82	31	45.6	22	32.4	LU
17.	Wall cabinets	3	4.41	14	20.6	38	55.9	13	19.1	LU
18.	Dustbins	6	8.82	35	51.5	26	38.2	1	1.47	MU
19.	Brooms (short and long)	8	11.7	33	48.5	24	35.3	13	19.1	MU
20.	Mops and mop buckets	11	16.2	38	55.9	12	17.6	7	10.3	MU
21.	Micro-wave oven	3	4.41	12	17.6	31	45.6	22	32.4	LU
22.	Aluminum pots (different sizes)	3	4.41	8	11.7	35	51.5	22	32.4	LU
23.	Aluminum pans (different sizes)	7	10.3	9	13.2	38	55.9	14	20.6	LU
24.	Double boilers	9	13.2	-	-	33	48.5	26	38.2	LU
25.	Pressure cookers	5	7.35	9	13.2	30	44.1	24	35.3	LU
26.	Baking trays of various sizes	3	4.41	11	16.2	32	47.1	22	32.4	LU
27.	Serving trays	6	8.82	8	11.7	32	47.1	22	32.4	LU
28.	Portable electric appliances	3	4.41	13	19.1	36	52.9	16	23.5	LU
29.	Grinding stones	6	8.82	1	1.47	36	52.9	25	36.8	LU
30.	Pestle and Mortar	3	4.41	34	50.0	17	25.0	14	20.6	MU
31.	Frying pans	7	10.3	31	45.6	18	26.5	12	17.6	MU
32.	Mixing bowls	9	13.2	38	55.9	17	25.0	4	5.88	MU
33.	Serving dishes and casserole dishes	3	4.41	35	51.5	16	23.5	14	20.6	MU
34.	Serving plates	4	5.88	35	51.5	20	29.4	9	13.2	MU
35.	Egg whisk and beater	5	7.35	4	5.88	38	55.9	21	30.9	LU
36.	Sieves	3	4.41	34	50.0	23	33.8	8	11.7	MU
37.	Basins (enamel, metals or plastics)	7	10.3	33	48.5	19	27.9	9	13.2	MU
38.	Teaspoons	4	5.88	31	45.6	22	32.4	11	16.2	MU
39.	Dessertspoons	2	2.94	32	47.1	29	42.6	5	7.35	MU
40.	Frying spoons	5	7.35	35	51.5	26	38.2	2	2.94	MU
41.	Serving spoons	6	8.82	38	55.9	21	30.9	3	4.41	MU
42.	Table forks	8	11.7	14	20.6	34	50.0	12	17.6	LU
43.	Serving spoons	4	5.88	38	55.9	16	23.5	10	14.7	MU
44.	Table forks	5	7.35	32	47.1	27	39.7	4	5.88	MU
45.	Frying forks	6	8.82	34	50.0	28	41.2	-	-	MU
46.	Desserts forks	5	7.35	36	52.9	26	38.2	1	1.47	MU
47.	Paring knives and spoons	7	10.3	38	55.9	13	19.1	10	14.7	MU
48.	Colanders (metals or plastic)	9	13.2	3	4.41	31	45.6	25	36.8	LU
49.	Palette knives	7	10.3	10	14.7	34	50.0	17	25.0	LU
50.	Icing sets	3	4.41	15	22.1	31	45.6	19	27.9	LU

51.	Bread knives.	5	7.35	38	55.9	21	30.9	4	5.88	MU
52.	Spatulas	6	8.82	35	51.5	15	22.1	12	17.6	MU
53.	Wooden spoons	5	7.35	34	50.0	16	23.5	13	19.1	MU
54.	Rolling pins	9	13.2	10	14.7	38	55.9	11	16.2	LU
55.	Calabashes	7	10.3	33	48.5	23	33.8	5	7.35	MU
56.	Pastry and chopping boards	8	11.7	36	52.9	17	25.0	7	10.3	MU
57.	Roasting pan	1	1.47	36	52.9	31	45.6	-	-	MU
58.	Tea Pot	5	7.35	32	47.1	27	39.7	4	5.88	MU
59.	Manual grinder	1	1.47	34	50.0	31	45.6	2	2.94	MU
60.	Tray (plastic, enamel)	6	8.82	38	55.9	14	20.6	10	14.7	MU
61.	Kitchen cloth	8	11.7	34	50.0	19	27.9	7	10.3	MU
62.	Drinking glasses	5	7.35	42	61.8	18	26.5	3	4.41	MU
63.	Steamers	2	2.94	1	1.47	32	47.1	33	48.5	LU
64.	Electric water purifiers	1	1.47	2	2.94	39	57.4	26	38.2	LU
65.	Micro-wave oven	7	10.3	4	5.88	36	52.9	21	30.9	LU

Source: Fieldwork 2023

The data presented in table 2 indicate that Kerosene Stove, Clay pots, Dish washer, plastic basin for water storage, Sinks, Dustbins, Brooms, Mops and mop buckets, Serving tables and chairs/stool, Frying pans, Mixing bowls, Serving dishes and casserole dishes, Serving spoon and plates, Sieves, Basins, Teaspoons, Dessertspoons and forks, Frying spoons and forks, Paring knives and spoons, Bread knives, Spatulas, Wooden spoons, Pastry and chopping boards, Roasting pan, Tea Pot, Manual grinder, Tray, Kitchen cloth and Drinking glasses are moderately utilized. Conversely, various other laboratory equipment showed low levels of utilization for the same purpose. This indicates that out of the items assessed, 29 were lowly utilized while 36 items exhibit a moderate level of utilization in the context of teaching and learning Food and Nutrition in these universities.

Research Question 3: What are the challenges faced by lecturers in utilizing the available material resources for effective teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria?

Table 3: The challenges faced by lecturers in utilizing laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria.

S/N	Challenges Faced by Lecturers in Utilizing Laboratory Equipment	Strongly Agreed (SA)		Moderately Agreed (MA)		Lowly Agreed (LA)		Not Agreed (NA)		Dec.
		Freq	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	
1.	Irrelevance to content and curriculum	40	58.2	14	20.59	12	17.6	2	2.94	SA
2.	Lack of incentives and motivation for teachers	55	80.9	9	13.2	4	5.88	-	-	SA
3.	Fear of damaging the materials during practical work	38	55.9	11	16.2	11	16.2	8	11.8	SA
4.	Shortage of power supply to power the equipment	52	76.5	7	10.3	6	8.82	3	4.41	SA
5.	Little time on the timetable to accommodate practical sessions	46	67.6	16	23.5	3	4.41	3	4.41	SA
6.	Lack of laboratory attendants to assist the lecturers during practical classes	51	75.0	6	8.82	9	13.2	2	2.94	SA
7.	Lack of laboratory space to accommodate the number of students to be taught	43	63.2	13	19.1	7	10.2	5	7.35	SA

8.	Inadequate provisions of textbooks and practical guides	52	76.5	10	14.7	4	5.88	2	2.94	SA
9.	Lack of maintenance of laboratory equipment due to negligence	56	82.4	12	17.6	-	-	-	-	SA
10.	Irrelevance to content and curriculum	44	64.7	18	26.4	5	7.35	1	1.47	SA

Source: Fieldwork 2023

The data presented in table 3 indicate that all the items are challenges faced by lecturers in utilizing laboratory equipment for teaching Food and Nutrition in Universities in South-South and South-East geopolitical zone in Nigeria. This implies that the lecturers strongly agreed that lack of incentive and motivation for lecturers, fear of damaging the materials during practical work, shortage of power supply, little time on the timetable to accommodate practical sessions, lack of space to accommodate the number of students to be taught and laboratory attendants to assist the lecturers during practical classes, inadequate provisions of textbooks and practical guides and maintenance culture as well as irrelevant curriculum contents are challenges facing the availability and utilization of laboratory equipment for teaching Food and Nutrition in Nigerian Universities.

Discussion

This study assessed the availability and utilization of laboratory equipment for teaching Food and Nutrition in Nigerian Universities, focusing on the South-South and South-East geopolitical zones. The data in Table 1 showed that several laboratory items, such as Kerosene Stove, Clay pots, plastic basin for water storage, Sinks, Dustbins, Brooms, Mops and mop buckets, Serving tables and chairs/stool, Frying pans, Mixing bowls, Serving dishes and casserole dishes, Serving plates, Egg whisk and beater, Sieves, Basins, Teaspoons, Dessertspoons and forks, Frying spoons and forks, Paring knives and spoons, Icing sets, Bread knives, Spatulas, Wooden spoons, Pastry and chopping boards, Roasting pan, Tea Pot, Manual grinder, Tray, Kitchen cloth, Drinking glasses, Serving spoons, and Steamers, were moderately available. Conversely, other laboratory equipment showed low availability. This implies a moderate availability of laboratory equipment for teaching and learning Food and Nutrition in universities, with 32 items being rated as lowly available and 33 as moderately available. This finding contrasts with previous studies that highlighted the inadequacy of relevant laboratory equipment for technical education (Adebisi, Tewogbade, & Olajide, 2017; Mbaga, Sambo & Tijjani 2018).

Similarly, Table 2 indicates that equipment such as Kerosene Stove, Clay pots, Dish washer, plastic basin for water storage, Sinks, Dustbins, Brooms, Mops and mop buckets, Serving tables and chairs/stool, Frying pans, Mixing bowls, Serving dishes and casserole dishes, Serving spoon and plates, Sieves, Basins, Teaspoons, Dessertspoons and forks, Frying spoons and forks, Paring knives and spoons, Bread knives, Spatulas, Wooden spoons, Pastry and chopping boards, Roasting pan, Tea Pot, Manual grinder, Tray, Kitchen cloth, and Drinking glasses are moderately utilized, while other laboratory equipment experience low utilization. This implies that 29 items are poorly utilized, and 36 items are moderately utilized for teaching Food and Nutrition in universities. This finding aligns with the study conducted by Edokpolor (2018), who observed that underutilization of facilities negatively impacts students' skills acquisition.

Moreover, Table 3 reveals that all the listed items pose challenges for lecturers in utilizing laboratory equipment for teaching Food and Nutrition. Lecturers strongly agreed that lack of incentives, fear of damaging materials, power supply shortages, limited timetable slots

for practical sessions, inadequate space for students and attendants, insufficient textbooks and practical guides, maintenance issues, and irrelevant curriculum contents hinder the availability and utilization of laboratory equipment. This aligns with the findings of Akinfolarin, Ajayi and Oloruntegbe (2012), who noted similar challenges in TVET programs due to lack of funds and maintenance, lack of incentives, and power supply shortages.

Conclusion

Laboratories serve as the bedrock for practical learning, experimentation, and skill development. In Nigeria, where food security, nutrition, and public health are pressing concerns, the role of universities in producing well-trained professionals in this field cannot be overstated. Quality Home Economics education hinges on the availability and utilization of laboratory equipment in Nigerian Universities. The study presented data on the availability and utilization of laboratory equipment for teaching Food and Nutrition. Specific laboratory items were identified as moderately available and moderately utilized. It is imperative to acknowledge the urgent need for strategic investments in laboratory infrastructure and resources in Nigerian universities offering Food and Nutrition programs. Such investments are essential for bridging the gap between theory and practice, enhancing the employability of graduates, and addressing the pressing issues of food security and nutrition in the country. The assessment presented in this paper serves as a call to action. It calls upon policymakers, university administrators, educators, and stakeholders in the field of Food and Nutrition to prioritize the improvement of laboratory infrastructure and teaching methodologies. By investing in these critical areas, Nigeria can strengthen its capacity to produce knowledgeable and skilled professionals who can contribute significantly to the nation's food security and public health agenda.

Recommendations

To enhance availability and effective utilization of Food and Nutrition laboratory equipment, the study proposes the following strategies:

1. Government at all levels should allocate adequate funds to facilitate acquisition of necessary Food and Nutrition laboratory equipment in Nigerian Universities.
2. Workshops, seminars, and conferences should be organized by government and NGOs to train and retrain lecturers on utilization of Food and Nutrition laboratory equipment in Nigerian Universities.
3. Government at all levels should ensure adequate supervision of the Universities to ensure proper equipment utilization and maintenance.
4. The universities should ensure the provision of sufficient timetable slots for practical sessions.
5. Ensuring ample laboratory space to accommodate student numbers.

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