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Impact of Laboratory Teaching Experience on Enhancing Secondary School Students' Cooking Skills in Delta State

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Abstract

The study examined the impact of home economics laboratory teaching experience on enhancing secondary school students' cooking skills in Delta State. The study was guided by three research questions and adopted a descriptive research design. The population comprised Home Economics teachers in Delta State secondary schools who specialize in food and nutrition. An accidental (convenience) sampling technique was used, and a sample of 100 nutrition teachers participated in the study. A closed-ended questionnaire consisting of 26 items was used to collect data. Descriptive statistics were employed to answer the research questions. A mean score of 2.50 and above was used as the benchmark for accepting an item, while a mean of 2.49 and below was considered rejected. Data analysis was carried out using SPSS. The findings revealed that teachers' laboratory experience had a high impact on students' acquisition of practical skills in food and nutrition. It also showed that laboratory training significantly improved students' culinary skills and their ability to make informed and healthy food choices. Based on these findings, it was recommended that diverse teaching methods should be employed to foster students' creativity. Teachers should also ensure that all practical aspects of food and nutrition are conducted in the kitchen laboratory and incorporate information and communication technology, such as instructional cooking videos, into their teaching.

Introduction

Home Economics is a subject through which a myriad of skills can be developed, including practical skills such as food preparation, cooking, planning, serving, and more. It is also a skill-oriented course that equips learners with marketable competencies, enabling them to pursue self-employment, self-reliance, and paid employment. This implies that the subject must be taught effectively by well-prepared teachers. However, there have been significant changes in the subject's processes, outcomes, content, skills, and value in recent times. Home Economics instils creativity in students and makes them resourceful and self-reliant. This objective cannot be achieved if teachers continue to ignore the importance of laboratory use in teaching and learning. Hasan, Thompson, and Almasri (2019) noted that practical work helps students develop manipulative skills that build confidence and enhance their ability to perform effectively in different situations.

The philosophy of Home Economics Education centres on improving the quality of life of individuals, families, and society at large. It focuses on the acquisition of knowledge, skills, and competencies required by family members to enhance family living. Food and Nutrition is a major component of Home Economics, comprising principles of nutrition and meal management alongside their practical applications. It is a practical-oriented aspect of the subject, and the science of Food and Nutrition cannot be effectively taught without engaging in practical activities (Adebisi, Opaleke, & Unomah, 2015). Food and Nutrition is therefore a practical-oriented subject that should be taught using practice and drill methods within a kitchen laboratory setting. These methods involve description, explanation, and hands-on practice. The instructional objectives emphasize the acquisition of skills and proficiencies in performing specific tasks, which are essential components of the subject. When students are exposed to various food practicals in school, they are better able to apply the acquired skills for sustainable living and long-term usefulness (Kembe, 2014).

There have been increasing calls for nutrition education as a means of preventing obesity and overweight. However, focusing solely on the transmission of nutrition knowledge is insufficient for controlling individuals' diets and food intake. Lang and Caraher (2021) argue that mastery of food and cooking skills is necessary for a comprehensive understanding of healthy living. Without practical, hands-on experience in food preparation and nutrition education, individuals' ability to make informed choices is weakened, often leading to dependence on processed and fast foods. Igunnu and Gbadebo (2012) further posited that Home Economics and Food and Nutrition courses provide students with the only opportunity to learn about nutrition and healthy eating through hands-on food preparation, which is more effective in changing behaviour than mere knowledge transmission.

As a learner-centred approach to teaching food practicals, students are expected to actively participate in the learning process to develop relevant skills. This approach provides opportunities for individual learners to practice repeatedly until mastery is achieved (Oniyama & Amroma-Asite, 2018). It also ensures that Food and Nutrition teaching is interactive, holistic, integrative, scientific, contextual, thematic, effective, and collaborative. These teaching-learning activities cannot be successfully implemented without competent teachers and adequate learning infrastructure, particularly well-equipped laboratories. The Home Economics laboratory, often referred to as the kitchen laboratory (Hasan et al., 2019), represents the total learning environment in which students engage in practical activities. It includes the norms of the school system and the organization of learners for effective instruction. This highlights the laboratory as an integral component of the learning environment. It plays a vital role in the interpersonal and educational development of secondary school students. A well-equipped laboratory provides an effective environment for practical learning, where essential skills can be acquired. Such an environment requires adequate equipment, motivated teachers who employ appropriate teaching methods, and sufficient facilities. Schools that lack these essential resources may not provide the conducive environment necessary for effective skill acquisition.

The study of Home Economics is essentially the study of life itself. It equips individuals with the ability to manage various aspects of life at home, within the community, and in society at large. It is a skill-oriented field designed to equip learners with survival skills that promote self-reliance, employment, and entrepreneurship. Occupational skills in Home Economics include food and nutrition, home management, and clothing and textile skills. Through the teaching of these occupational skills, the Home Economics programme enables individuals to explore and prepare for careers or trades. Consequently, Home Economics can contribute significantly to achieving the goals of the National Economic and Development Strategy (NEEDS). It prepares young people for life's opportunities and challenges by equipping them with essential social, creative, and managerial skills.

The Home Economics laboratory provides students with hands-on experience in every lesson, thereby enhancing their practical abilities and skills application. It also offers early training opportunities under the guidance of teachers. Skill acquisition through such training is essential in Home Economics, and the availability of adequate equipment and facilities can reduce the financial burden on students, who are often required to provide their own cooking utensils. Teachers' laboratory experience plays a crucial role in equipping students with practical competencies. These include culinary skills such as cooking and food preparation, as well as other related practical abilities. Empirical studies highlight the effectiveness of practical, learner-centred approaches in skill acquisition. Jones (2020) and Brown (2021) emphasize that laboratory activities enhance students' engagement, technical competence, and critical thinking. This aligns with Onyiorah (2021), who advocates innovative teaching strategies to improve learning outcomes, and Onyiorah (2022), who stresses the value of experiential and technology-supported learning. Similarly, Oguejiofor and Onyiorah (2021) note that the use of modern instructional tools enhances skill development, while Oguejiofor et al. (2022) link practical education to employability and global competitiveness.

Furthermore, Onyiorah (2023) affirms that teachers' professional expertise significantly improves instructional delivery and students' skill acquisition.

Furthermore, the hands-on nature of laboratory work allows students to learn from their mistakes, make necessary adjustments, and develop resilience. Eisenberg, Righter, and Matthews (2017) found that laboratory teaching significantly improves students' cooking skills, confidence, and understanding of nutrition concepts. Similarly, Surgenor, McMahon-Beattie, Burns, and Hollywood (2016) reported that laboratory teaching methods enhance a wide range of culinary skills, including knife handling, cooking methods such as sautéing and baking, sauce preparation, pastry making, flavour development, plating, and food safety practices. Additionally, kitchen laboratory training exposes students to diverse cuisines and culinary traditions, broadening their knowledge and cultural awareness (Eisenberg et al., 2017). It also promotes collaborative learning, as students often work in groups to complete culinary tasks, thereby developing communication, teamwork, and problem-solving skills (Wilson, 2019). This collaborative experience reflects real-world culinary environments where teamwork is essential. Overall, laboratory training provides students with practical knowledge, creativity, cultural understanding, and professionalism required in the culinary field (Jones, 2019).

Regarding the influence of teachers' laboratory experience on students' ability to make informed and healthy food choices, Eisenberg et al. (2017) emphasized that teachers' practical expertise enhances students' food literacy and decision-making skills. Teachers with laboratory experience are better positioned to teach students about ingredient selection, meal planning, and cooking techniques. Green (2019) added that such teachers can guide students in evaluating food products critically and identifying unhealthy components such as excessive sugars and fats. Moreover, teachers with laboratory experience can design hands-on activities that encourage students to explore healthier food alternatives. Thompson et al. (2018) found that students taught by experienced teachers demonstrated improved food literacy, increased confidence in preparing healthy meals, and a greater willingness to try new foods. Eisenberg et al. (2017) further observed that students exposed to laboratory-based Home Economics curricula showed long-term improvements in dietary behaviour, including increased consumption of fruits and vegetables and reduced intake of sugary snacks.

Similarly, Smith and Brown (2020) highlighted that teachers with extensive training and experience are more effective in promoting healthy eating habits among students. A longitudinal study by Thompson et al. (2017) also demonstrated that sustained nutrition education positively influences students' food choices, eating behaviours, and overall dietary quality. Although these studies do not exclusively focus on teachers' laboratory experience, they indicate the potential for long-term positive outcomes when practical-based teaching approaches are employed in Home Economics education.

Statement of the Problem

Senior high school students enrolled in Food and Nutrition courses require practical skills and knowledge to make informed decisions about food choices, meal planning, and food preparation. However, traditional classroom instruction may not adequately equip students with the necessary hands-on experience needed to develop these essential skills. Therefore, it becomes necessary to explore the effect of kitchen laboratory training on the skill development of senior high school students in Food and Nutrition. The problem, therefore, lies in the limited understanding of how kitchen laboratory training specifically contributes to the development of practical skills in Food and Nutrition. Although some studies have examined this area, further investigation is required to provide a more comprehensive understanding of the effectiveness of this instructional approach. This study aims to assess the extent to which kitchen laboratory training enhances students' culinary skills, improves their nutrition knowledge, and strengthens their ability to make healthy food choices.

Understanding the impact of kitchen laboratory training on skill development in Food and Nutrition is essential for educators, curriculum developers, and policymakers. The findings of this study can guide improvements in curriculum design, teaching methods, and resource allocation, ensuring that senior high school students are adequately equipped with the practical skills and knowledge needed to promote healthy eating habits and make informed food decisions. By bridging the gap between theory and practice, kitchen laboratory training can empower students to become competent and responsible consumers in the field of Food and Nutrition.

Research Questions

The following research questions were formulated and addressed in the study:

1. What is the impact of teachers' laboratory experience on the acquisition of students' practical skills in Food and Nutrition?
2. What is the level of impact of Home Economics laboratory training on the improvement of students' culinary skills in Food and Nutrition?
3. What is the level of impact of Home Economics teachers' laboratory experience on enhancing students' ability to make informed and healthy food choices?

Purpose of the Study

The main purpose of this study was to examine the impact of Home Economics laboratory teaching experience on enhancing students' cooking skills. The specific objectives of the study were to:

1. Determine the impact of teachers' laboratory experience on the acquisition of students' practical skills in Food and Nutrition.
2. Examine the level of impact of Home Economics laboratory training on the improvement of students' culinary skills in Food and Nutrition.
3. Assess the level of impact of Home Economics teachers' laboratory experience on enhancing students' ability to make informed and healthy food choices.

Methodology

This study adopted a descriptive survey research design to examine the impact of Home Economics laboratory teaching experience on enhancing students' cooking skills. The descriptive survey design was considered appropriate because it allows for the collection of data from a defined population in order to describe existing conditions, practices, and relationships without manipulating any variables. It also provides an opportunity to obtain the opinions and perceptions of respondents regarding the subject under investigation. The target population for the study consisted of all Home Economics teachers in secondary schools in Delta State who specialize in Food and Nutrition. These teachers were considered suitable respondents because of their direct involvement in teaching practical and theoretical aspects of the subject. Their experiences and insights were therefore essential for assessing the effectiveness of laboratory teaching in skill development among students.

A purposive sampling technique was employed to select participants for the study. This sampling method was used because it enabled the researcher to deliberately select respondents who possess the required knowledge and experience relevant to the study. Through this approach, a sample size of 100 Home Economics teachers was drawn from the population. This sample size was considered adequate to provide reliable and meaningful data for the study. Data for the study were collected using a structured questionnaire designed by the researcher. The questionnaire was in a closed-ended format and organized using a four-point Likert scale of Very High (4), High (3), Low (2), and Very Low (1). The use of a closed-ended questionnaire ensured uniformity in responses and facilitated ease of analysis. The items in the questionnaire were carefully constructed to address the

research questions and objectives of the study, focusing on teachers' laboratory experience, students' practical skills acquisition, and their ability to make informed food choices.

To ensure the reliability of the instrument, the Cronbach Alpha method was employed. This statistical technique measures the internal consistency of the questionnaire items. The reliability analysis yielded a coefficient value of 0.85, indicating a high level of reliability and confirming that the instrument was suitable for data collection. For data analysis, descriptive statistics such as mean and standard deviation were used to answer the research questions. A criterion mean of 2.50 was established as the benchmark for decision-making. Any item with a mean score of 2.50 and above was regarded as having a high impact or being accepted, while items with mean scores below 2.50 were considered to have low impact or were rejected. All statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS). The use of SPSS enhanced the accuracy, efficiency, and organization of the data analysis process. The results obtained were presented in a clear and systematic manner to facilitate interpretation and discussion in line with the objectives of the study.

Results

Research Question One

What is the impact of teachers' laboratory experience on the acquisition of students' practical skills in Food and Nutrition?

Table 1: Mean and Standard Deviation Analysis of the Impact of Teachers' Laboratory Experience on the Acquisition of Students' Practical Skills in Food and Nutrition

S/N	STATEMENTS	N = 100 Sum	MEAN = S/N	SD	REMARK
1.	Students were able to acquire proficiency in using kitchen tools and equipment	343	3.43	.679	High
2.	Through laboratory teaching students became competence in honing knife skills	318	3.18	.796	High
3.	Students acquired skills in mastering cooking methods	335	3.35	.721	High
4.	Students, through laboratory teaching had the ability to explore different cooking techniques	320	3.20	.806	High
5.	Skills in applying nutrition knowledge as a result of laboratory teaching	325	3.25	.762	High
6.	Through laboratory teaching students acquired skills on balanced diets, dietary guidelines	333	3.33	.776	High
7.	Students were able to know the nutritional content of different food groups as a result of laboratory teaching	293	2.93	.811	High
8.	Students were able to acquire skills on food safety and sanitation practices as a result of laboratory teaching	331	3.31	.779	High
9.	Students acquired hygiene measures skill as a result of an effective laboratory teaching	296	2.96	.829	High

The analysis presented in Table 1 shows that the mean scores of all nine statements are above the cut-off point of 2.50. This indicates that the respondents rated all items at a high level. The overall

mean score of 3.22 exceeds the benchmark of 2.50, confirming that teachers' laboratory experience has a high impact on the acquisition of students' practical skills in Food and Nutrition.

Research Question Two

What is the level of impact of Home Economics laboratory training on the improvement of students' culinary skills in Food and Nutrition?

Table 2: Mean and Standard Deviation Analysis of the Level of Impact of Home Economics Laboratory Training on the Improvement of Students' Culinary Skills in Food and Nutrition

S/N	STATEMENTS	N = 100 Sum	MEAN = S/N	SD	REMARK
1.	Laboratory teaching has impacted students knife handling skills (proper handling, cutting techniques)	307	3.07	.858	High
2.	Students have acquired cooking method skills (sautéing, grilling, baking) through laboratory teaching	303	3.03	.800	High
3.	Students have acquired proper sauce making skills through laboratory teaching	299	2.99	.845	High
4.	The pastry and baking technique skills of students are optimally okay as a result of kitchen laboratory teaching	360	3.60	.613	High
5.	Students, through practical teaching in the kitchen laboratory have acquired flavor development skills	299	2.99	.848	High
6.	Kitchen laboratory teaching has improved the plating and presentation skills of students.	313	3.13	.820	High
7.	Students have acquired some necessary recipe formulation skills as a result of kitchen laboratory teaching	309	3.09	.810	High
8.	Students, as a result of laboratory teaching have acquired some menu planning skills	341	3.41	.698	High
9.	Students have been able to learn some basic butchery techniques skills through kitchen laboratory teaching	324	3.24	.776	High

The analysis in Table 2 reveals that all mean scores are above the cut-off point of 2.50, indicating a high level of agreement among respondents. The overall mean score of 2.86 exceeds the benchmark, suggesting that Home Economics laboratory training has a high impact on improving students' culinary skills in Food and Nutrition.

Research Question Three

What is the level of impact of Home Economics teachers' laboratory experience on enhancing students' ability to make informed and healthy food choices?

Table 3: Mean and Standard Deviation Analysis of the Level of Impact of Home Economics Teachers' Laboratory Experience on Enhancing Students' Ability to Make Informed and Healthy Food Choices

S/N	STATEMENTS	N = 100 Sum	MEAN = S/N	SD	REMARK

1.	Laboratory teaching has impacted on students overall food literacy and decision-making abilities	323	3.23	.773	High
2.	Students acquire the ability to make ingredient selection ability as a result of exposure to laboratory teaching	315	3.15	.801	High
3.	Laboratory teaching impacts on students' cooking technique skills	296	2.96	.879	High
4.	Teachers' laboratory teaching can effectively impact on students' decision in making healthier food choices based	311	3.11	.790	High
5.	Teachers' laboratory teaching can effectively impact students' knowledge about food labelling and understanding nutritional information	312	3.12	.802	High
6.	Laboratory teaching impacts on students in making critical evaluation concerning food products, identify hidden sugars, unhealthy fats, and other potential pitfalls in packaged foods	345	3.45	.692	High
7.	Teachers through laboratory teaching can develop in students greater competence in making informed food choices	317	3.17	.832	High
8.	Laboratory teaching impacts on students by increasing in their confidence in their ability to select and prepare healthy meals, and a greater willingness to try new foods	300	3.00	.835	High

The analysis in Table 3 indicates that all mean scores are above the cut-off point of 2.50. This shows a high level of agreement among respondents. Therefore, it can be concluded that Home Economics teachers' laboratory experience has a high impact on enhancing students' ability to make informed and healthy food choices.

Discussion of Findings

The first finding of this study revealed that teachers' laboratory experience had a high impact on the acquisition of students' practical skills in Food and Nutrition. This finding is consistent with that of Jones (2020), who reported that in a laboratory setting, students actively engage in various practical activities such as meal planning, recipe development, food preparation, and cooking. Through these activities, students develop proficiency in the use of kitchen tools and equipment, improve their knife skills, master different cooking methods, and explore a variety of cooking techniques. Similarly, Brown (2021) noted that Home Economics laboratories promote critical thinking and problem-solving skills, as students are encouraged to analyze recipes, adapt them to suit dietary needs or available ingredients, and troubleshoot challenges that may arise during food preparation. The hands-on nature of laboratory work enables students to learn from their mistakes, make necessary adjustments, and develop resilience in the kitchen. Furthermore, Eisenberg, Righter, and Matthews (2017) found that laboratory teaching had a significant impact on students, as those who participated in kitchen laboratory activities demonstrated improved cooking skills, increased confidence in their culinary abilities, and enhanced understanding of nutrition concepts.

The second finding of the study revealed that Home Economics laboratory training had a high impact on the improvement of students' culinary skills in Food and Nutrition. This finding aligns with

Surgenor, McMahon-Beattie, Burns, and Hollywood (2016), who observed that laboratory teaching methods significantly enhance students' culinary skills. These skills include knife handling techniques, cooking methods such as sautéing, grilling, and baking, sauce preparation, pastry and baking techniques, flavour development, plating and presentation, recipe formulation, food safety and sanitation practices, and menu planning. In addition, Eisenberg, Righter, and Matthews (2017) reported that kitchen laboratory training encourages students to explore diverse cuisines and culinary traditions. Through this exposure, students learn about different ingredients, spices, and cooking techniques from around the world, thereby broadening their culinary knowledge and enhancing cultural appreciation.

The third finding of the study revealed that the level of impact of Home Economics teachers' laboratory experience on enhancing students' ability to make informed and healthy food choices was high. This finding is in agreement with Eisenberg, Righter, and Matthews (2017), who noted that teachers' practical knowledge and expertise in food preparation and nutrition provide students with valuable insights and skills that improve their food literacy and decision-making abilities. When Home Economics teachers possess hands-on laboratory experience, they are better equipped to teach students about key aspects of food, including ingredient selection, meal planning, and cooking techniques. Green (2019) also observed that such teachers can educate students on how to critically evaluate food products, identify hidden sugars and unhealthy fats, and recognize potential risks in processed foods. Additionally, teachers with laboratory experience can provide hands-on activities that encourage students to explore and experiment with healthy food alternatives.

Conclusion

In conclusion, exposure of students to food practicals is essential for effective skill acquisition. Food processing activities help train students to convert raw food and agricultural produce into edible, usable, and palatable forms. Food and Nutrition courses provide a unique opportunity for students to learn about nutrition and healthy eating through hands-on food preparation, which has been shown to be more effective in changing behaviour than mere theoretical instruction. Furthermore, the socio-economic background of students was found not to significantly influence their ability to acquire these skills.

Based on the findings, it was concluded that teachers' laboratory experience significantly impacts the acquisition of students' practical skills in Food and Nutrition. It was also concluded that Home Economics laboratory training greatly improves students' culinary skills. Additionally, teachers' laboratory experience enhances students' ability to make informed and healthy food choices. Therefore, the study recommends that diverse teaching methods should be adopted to foster creativity among students. It is also recommended that teachers ensure that all practical aspects of Food and Nutrition are conducted in well-equipped kitchen laboratories. Furthermore, teachers should integrate information and communication technology into their teaching by incorporating instructional videos of various cooking recipes and techniques to enhance students' learning experiences.

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