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**SURVEY ON HOME-ECONOMICS TEACHERS PERCEPTION ON APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN FOOD AND NUTRITION TO ENHANCE NUTRITION KNOWLEDGE AND PRACTICES IN HOMES AND SOCIETY**

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### **Abstract**

*This study “Survey on Home Economics Teachers Perception on Application of Artificial Intelligence Technology in Food and Nutrition Teaching Learning to Enhance Nutrition Knowledge and Practices in Homes and Society” was guided by three research purposes and research questions. A survey research design was employed, population of study was made up of all Home Economics teachers in all the public secondary school in Oshimili South and structured questionnaire focused on the study subject matter was used for data collection. Data collected from the field survey was analysed using mean ( $\bar{x}$ ) statistic. Result revealed; one (1) that Home Economics teachers do not have positive perception for the application. AI in the teaching of food and nutrition X 2.1, (2) teaching learning situations are not conducive and (3) irregular electricity supply is a factor militating AI technology application in schools. Based on this finding, it was recommended that the Federal Ministry of Education should provide in-service training opportunities to enable teachers gain insight and be fully prepared for the application of AI in their duty post among others.*

### **Introduction**

Home Economics has been defined severally and commonly acceptable definitions acknowledge that Home Economics is the study of Laws, conditions, principles and ideas which are concerned on one hand with Man’s immediate physical environment and on the other, with his nature as a social being. Specifically, International Federation of Home Economics (IFHE, 2022) opined that home economics is a field of study which includes such aspects as food and nutrition, clothing and textile, home management, institution management and consumerism among others. The Food and Nutrition aspect of Home Economics curriculum is very important to humans because, Nutrition continuous to play significant role in human health from conception till death (Salami, 2017). Human depends on the nutritive values (contents) of food consumed to grow, develop, maintain good health and sustain life; and the major sources of nutrients to the body is food, which is the primary focuses of food and nutrition curriculum in school, and it is a compulsory subject in the primary till secondary levels. The information on types of foods, sources, nutritive contents and their functions in human body to support growth and development as well as causes of disease condition, management or preventions are clearly spelt out in food and nutrition curriculum. However, both past and present health reports have shown that people that has been exposed to Food and Nutrition Curricular information in school still suffer

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nutritional health challenges related either to under nutrition or over-nutrition (toxicity) health challenges (Uko-Aniomoh, 2019). These challenging conditions according to World Health Organization (WHO, 2018) results from limited knowledge and unhealthy nutritional practices of persons especially in the under developed world. This singular reason necessitated the researchers to carry out a survey on this topic to establish if the application of Artificial Intelligence Technology in the teaching learning of food and nutrition situation in schools can enhance learners understanding and practices of healthy food choice according to their nutritional values and consumption practices to sustain good health. Artificial intelligence (AI) is conceptualized as the ability of a computer programme or robots to perform human task (Copeland, 2023). AI programme have the ability of an intelligent being to interact with its environment and learn from experience. AI technology is briquetted in our life as inform of software or embedded in hardware (Gupta, 2018). AI has been successfully applied in Agro-food industries to enhance food quality control, products yielding and perseveres among other (Uko-Aviomoh, 2019) and can be applied in teaching learning situation to sources information on food nutrients contents, functions in the body, adequate diets for individuals using their basal metabolic under (BMI) and proper food process activities that can enhance food choice and health feeding pattern. AI technology can also provide information to individuals on healthy food shopping , and meal planning. Apps on plant-based meals , generative AL or GEN AI can generate texts by analyzing data set very fast among others (Mashel, 2022).

AI technology in food and nutrition practices can help individuals

- ❖ Prevent obesity and health life style discuss
- ❖ Food choice that strengthen immune system
- ❖ Better growth and physical health as eating well promotes physical health and development.
- ❖ Increase energy level and reduce fatigues
- ❖ Improve academic performance and cognitive functions among other.

With the few highlights on how Artificial Intelligence Technology can enhance healthy nutrition knowledge and practices, the researchers established the perception of Home Economics teachers on application of AI technology in teaching – learning conditions.

### **Statement of the Problem**

The application of Artificial intelligence technology in different fields of endeavours have been noted to have enhanced expected out comes, specifically in food production, processing, preservation and other aspects of food business, AI has contributed immensely to obtaining a better feedback than usual in many fields of endeavour that if applied in teaching- learning situation will enhances learners level of understanding of learning out come and practice to ensure better nutrition health status and longevity. The problem statement therefore are; what is the perception of Home Economics Teachers in Oshimili South Local Government Area on the need to acquire computer literacy and apply AI intelligence Technology in the teaching learning situations food and nutrition subject in schools.

### **Purpose of the Study**

The main purpose of this study is to establish the perception of Home Economics teachers on the need to apply AI technology in teaching – learning situation of food and nutrition curriculum to enhance learners nutrition knowledge and practices for healthy lives. Specifically, the researchers established if:

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1. Home Economics teachers are willing to acquire computer literacy to be proficient in the use of digital pedagogy in learning teaching food and Nutrition in school.
2. The present teaching learning conditions in school can support the application of AI in subjects teaching.
3. What factors may militate against the use of AI technology application in the teaching of Food and Nutrition in schools

### **Research Questions**

The following research questions guided the study

1. What is the perception of Home Economics teachers on the need to acquire ICT literacy to be able to apply AI technology in teaching and learning of Food and Nutrition in schools?
2. Does present teaching learning conditions support the application of AI technology in teaching – learning of Food and Nutrition in School?
3. What factors militate against the application of AI technology in teaching learning for better understanding and practice of nutrition knowledge and skills for better health status?

### **Significance of the Study**

The findings of this study, if made available to the public, through publication in journal, magazines, conferences and workshops, will be beneficial to the citizenry, Home Economics professionals and Federal Government. The citizenry will benefit adequate nutrition knowledge and nutrition practices that will enable them to make healthy food choices and consumption pattern. Home Economics professional will benefit as resultant effect will enable them achieve their noble aim of well being of individuals in the homes and society. The government will benefit as less income of the nation's economy will be channelled to health care and disease control among citizenry.

### **Methodology**

The researchers employed a survey research method. A survey research method according to Okeke (2021) is that research method, where the researchers will not manipulate any of the study variables, rather opinions of the sampled respondents, according to the knowledge, practice or perception in accordance with study subject matter will be collected and analyzed to draw conclusion of the study.

### **Population of the Study**

The population of the study was made up of all Home Economics teachers in all public secondary schools in Oshimili South L.G.A of Delta North Senatorial zone, Delta State. The actual population size was one hundred and twenty one (121) Home Economics teachers.

Source: Oshimili South Post Primary Education Board Record, (2024)

### **Sample and Sampling Techniques**

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The researchers employed convenience and purposive sampling techniques to select all Home-economics teachers present in the secondary schools at the time of visit for data collection. Therefore, only the Home Economics Teachers on ground participated in study. This technique was employed because study population was manageable.

### **Instrument for Data Collection**

The researchers employed a structured questionnaire for data collection. The questionnaire was structured in sections A and B. Section A consisted of five (5) Bio-metric information while section B consisted of fifteen closed-end items focused on the study subject matters. Designed in modified four (4) point likert-scale, namely strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) respectively.

### **Validity of the Instrument**

The validity of the instrument was carried out by a professor in Home Economics Education, University of Abaraka Delta State and two other principle lecturers in Federal College of Education (Technical) Asaba. Their validation was based on the items content suitability to obtaining valid data on the study subject matter. All observed correction was duly effected before the use of the final copies in the field survey.

### **Reliability of the Instrument**

The reliability of the instrument was established through test-retest as ten copies of the instrument was administered to ten (10) Home Economics teachers in oshimili North twice within two (2) interval. The data generated in the two occasion was subjected to Spearman correlation co-efficiency and was found to be 0.87 at alpha levels of 0.05 significance indicating high reliability.

### **Method of Data Collection**

The researchers visited the sampled public secondary schools, identified with Home Economics teachers present in the school as at the time of visit, briefed them on the objective of the study, administered the instrument to them, guide them to appropriate completion of the instrument and retrieved the completed ones on the spot. On the whole, a total number of one hundred and one ( 101) completed instrument was retrieved from the field as some of the Home Economics teachers were not on ground as at the time of data collection.

### **Method of Data Analysis**

Data collected from the field survey was analyzed using mean statistics. A mean (x) of 2.5 and above indicated acceptance of opinion while a mean of (x) less than 2.5 and below indicated rejection of opinion.

$$\begin{aligned} & \text{SA} - 4 \text{ points, A} - 3 \text{ points, D} - 2 \text{ Points and SD} = 1 \text{ Point} \\ & = 4 + 3 + 2 + 1 = 10/4 = 2.5 \end{aligned}$$

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## Result

### Section A: Biometric Data

Bio-metric data analysis revealed that:

- i. The numbers of respondents Secondary Schools were nineteen (19) public Secondary Schools in Oshimili South L.G.A
- ii. Respondents sex were: Male (4) and female (97)
- iii. Respondents areas of specialization in Home Economics were: Food and Nutrition: 82, Home Management: 17, Clothing and Textile: 2
- iv. Academic Qualifications: NCE – 7 participants, B.Sc(Ed) – 78 participant and post graduates – 15 participants
- v. Years of experience: Less than five years ; 7 : 6----- (10) years – 43,; 11 – 15 year – 38 ;;and 16 – year and above 13 participants respectively

### Section B: Research Questions

Research Question One: What is the perception of Home-Economics teachers on the need to acquire ICT literacy to be able to apply AI technology in teaching-learning of Food and Nutrition in school?

**Table 1: Home Economics Teachers perception of the need of ICT Literacy**

S/N	ITEMS	SA	A	D	SD	Total Scope	WTD Score	X	Remark
	All home economics teachers in Oshimili South LGA Should:								
1	Be ICT Literate	17	26	30	28	101	234	2.3	Rejected
2	Be able to effectively interact with ICT	15	23	32	31	101	227	2.2	Rejected
3	Be able to source needed information on food nutritive values	12	21	29	39	101	208	2.1	Rejected
4	Be effective in bringing AI nutrition information to real life examples with foods in the environment	13	23	31	34	101	217	2.1	Rejected
5	Be able to exposes learners on how to evaluate nutritional adequacy of personal nutrient consumption pattern	10	18	33	40	101	200	2.0	Rejected
	<b>Grand Mean (x)</b>							<b>2.1</b>	<b>Rejected</b>



Table one, revealed grand x of 2.1 lower than the X of acceptance. This indicates that Home Economics teachers in Oshimili south L.G.A do not have a positive perception on the need to apply AI technology in the teaching-learning situation of Food and Nutrition in secondary schools.

Research Question Two: Does the present teaching and learning conditions support the application of AI technology in the teaching and learning of food and nutrition in schools?

**Table 2: Conditions for the application of AI Technology in teaching learning of Food and Nutrition**

S/N	ITEMS	SA	A	D	SD	Total Scope	WTD Score	X	Remark
	All public secondary schools in Oshimili South LGA has								
6	ICT enabled Food Laboratory	11	16	31	43	101	197	2.0	Rejected
7	Internet facilities that enables teachers and learners to source nutrition information using artificial intelligence packages	09	13	34	45	101	188	1.8	Rejected
8	Access Valid information of nutrition practices to maintain good health	13	19	34	35	101	214	2.1	Rejected
9	Access valid information on benefits healthy food choice and consumption patterns	13	21	37	30	101	224	2.2	Rejected
5	Enable teaching – learning conditions to be clear like real-life practical conditions	14	19	31	37	101	212	2.0	Rejected
	<b>Grand Mean (x)</b>							<b>2.0</b>	<b>Rejected</b>

Field Survey, 2025.

Table 2, revealed a grand x of 2.0, lower than the x of acceptance – 2.5. This indicates that the Food and Nutrition Teaching Learning condition in Oshimili South L.G.A. is not conducive for the application of AI technology.

Research Question Three: What factors militate against the application of AI technology in teaching – learning of Food and Nutrition in schools to attain expected learning objectives?

**Table 3: Factors Militating against the application of AI technology in the teaching of Food and Nutrition**

S/N	ITEMS	SA	A	D	SD	Total Scope	WTD Score	X	Remark
	Factors militating the application of								

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	AI technology in teaching – learning of Food and Nutrition includes:								
11	Non availability ICT enabled laboratory in public secondary schools	16	27	29	30	101	233	2.02	Rejected
12	Illregular electrical power supply during school hours	19	33	22	27	101	249	2.5	Accepted
13	Teachers lack of ICT knowledge and skills need to for effective interaction with ICT equipments and tools	13	29	31	28	101	229	2.3	Rejected
14	Poor equipped laboratories	17	28	30	26	101	238	2.3	Rejected
15	limited lesson period for practical subjects in school time table	13	19	29	40	101	207	2.0	Rejected
	<b>Grand Mean (x)</b>							<b>2.3</b>	<b>Rejected</b>

Field Survey, 2025

Table 3 above revealed a grand x of 2.3, lower than the accept x of 2.5. However item number twelve (12) which looked into electrical power supply during school hours scored a grand x of 2.5 indicating that in availability of electrical power supply is a hindrance in application AI technology in public secondary school.

### Findings of the Study

Research question 1, revealed a grand x of 2.1 indicating that Home Economics teachers in public Secondary Schools do not have positive perception on the need of application of AI technology in the teaching of food and nutrition in school. Research question 2, revealed a grand x of 2.0 indicating that teaching learning condition in public secondary schools are not conducive for the application of AI technology during Food and Nutrition classes. Research question 3; revealed a grand x of 2.3 indicating that the suggested factors, militating against the application of AI in teaching food and nutrition in school are not challenges, accept the case of irregular electrical power supply that has a x of 2.5.

### Discussion of Findings

From the findings of research question I which revealed that Home Economic teachers do not have positive perception on the application of AI technology in the teaching learning situation. This finding is in line with WHO (2016) report, that remarked the cause of double burden disease in under developed countries results from illiteracy as people lack basic knowledge nutrition and their unwillingness to shift from traditional believes and practices in food choice and consumption pattern. Research question 2, revealed that the teaching learning conditions of Food and Nutrition are not conducive x 2.1. This finding is also in line with Copeland(2023). Who remarked that AI technology been bequited to humans

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as software or hardware has continued to be neglected in some critical condition where financing its acquisitions has been seen as a wasted of resources that could be channel to more important issues Research question 3: revealed that factors militating against the application of AI technology in secondary schools in Oshimili South LAG is irregular electricity power supply with a grand x of 2.5 . This is in line with Afe (2024) who remarked that the greatest draw back affecting the integration of technology in teaching learning condition is power supply because electrical energy are required to operate the technological gargets to be function and useful in the required situations.

## Conclusion

From the finding of this study, Home Economics teachers perception on the application of AI technology in teaching learning of food and nutrition is negative. The study also revealed that the teaching learning conditions are not conducive for the application of AI technology and that irregular electrical power supply during school hours is a major challenge militating against the application of AI technology in learning situation.

## Recommendation

Based on the above finding of the study, the researchers recommends:

1. The Federal ministry of education should use her good office to provide ICT training opportunities for her in-service teachers to enable them acquire knowledge and skills in the use of ICT in their duty post.
2. The Federal and State government should also use their good office of Ministry of Education at all level of governance to provide a conducive teaching learning environment by provided needed infrastructure, equipment and tools needs in schools for effective practice experience acquisitions in schools.
3. Vocational Education teachers should endeavor to acquaint themselves with recent technological knowledge and skills that make efficient in the attainment of curriculum objective in practical conditions
4. The school management authorities should dialogue with the electrical power supply industries for regular power supply during school hours, when it will useful for learning activities rather than when school works activities are not in place.

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