AGRICULTURAL EDUCATION FISH DEMONSTRATION FARM AND ACQUISITION OF PSYCHO-PRODUCTIVE SKILLS IN FISH FEEDING AND DISEASE MANAGEMENT BY UNDERGRADUATE STUDENTS

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ABSTRACT

The study sought to determine the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding and disease management by undergraduate students of Agricultural Education in tertiary institutions in Akwa Ibom State. Two research questions and two research hypotheses guided the study which adopted a descriptive survey design.The population of the study consisted of 268 undergraduate students of tertiary institutions in Akwa Ibom State offering Agricultural Education Programme from where a sample size of 135 was purposively drawn.A psycho-productive skills acquisition structured questionnaire titled "Fish Demonstration Farm and Acquisition of Psycho-Productive Skills Questionnaire (FIDEFAPSQ)" was developed by the researchers to generate data for the study.The reliability of the instrument was established by using Cronbach alpha and test re-test method for estimating the internal consistency of the instrument.Data collected were analysed using mean statistic to answer the research questions while the hypotheses were tested using independent t-test at 0.05 level of significance. Findings of the study indicated that students acquired moderate competence level of psycho-productive skills in fish feeding and disease management. Findings further showed that there was no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding and disease management. On the basis of the findings, it was recommended among others that Agricultural Educationist should select and adopt instructional approaches and strategies that would involve the use of demonstration farms in delivering of course contents to foster skill acquisition in fish feeding and disease management by students.

KEY WORDS: Fish Demonstration Farm, Fish Feeding Skills, Psycho-Productive Skills and Disease Management Skills

INTRODUCTION

Fish is a renewable natural resource and plays a great role in the improvement of socio-economic condition of poor fishers. It is an important source of animal protein for both man and livestock in developed and developing countries. Fish remains an important dietary element for Nigeria, especially in the southern part of the country where fish is highly valued as one of the cheapest sources of animal protein available to

many Nigerians (FAO, 2022).Fish accounts for around 40% of the country's protein intake. The total fish production per year is around 1.07 million metric tons while the demand is 3.36 million thereby leaving a gap of 2.5 million metric tons (Central Bank of Nigeria, CBN 2023). The Central Bank of Nigeria in its report on 6th September 2023 disclosed that Nigeria imports 700,000 metric tons of fish annually indicating that the current local fish production in Nigeria is still inadequate to meet the domestic consumption demands.

The world population is presently over 8.1 billion with a projection of about a 25% increase in the next 30 years which will make the world population 9.9 billion by 2050 (United Nation, 2023). Nigeria, the 6th most populated country globally with a population of 223 million people makes up 2.78% of the global population (United Nation, 2023). While the global population is projected to increase by 25% by 2050, Nigeria's population is projected to be 401.3 million (99.82% increase) by 2050 (United Nation, 2023). This rapid increase in population of Nigeria and the world population in general has led to high competition for natural resources, especially food resources. Fisheries and aquaculture has been identified as an important sector for attaining food security (FAO, 2022).

Fish production is significant to the Nigerian economy given its importance in providing a cheap source of food/nutrition security, income, employment and serves as a source of foreign exchange. A deficit in Nigeria's fish production presents a significant threat to food security and nutritional requirement of the growing population. To tackle this deficit and prevent the looming food crises from escalating, more man-power must be trained to participate in the fish production industry through tertiary Education.

Fish production is a core technical area in Agricultural Education. Agricultural education is the type of education employed in training learners in the process of agricultural productivity as well as the techniques for teaching agriculture. Agricultural Education gives training and imparts the necessary skills to individuals who shall be productive and self-reliant. The skills acquired through agriculture contribute to agricultural growth and development since it deals with improved production and handling practices, which guarantee quality of output, high productivity and food security. It has also contributed to transfer of agricultural technology, dissemination of innovations, farmers' education and enlightenment in both the urban centres and rural areas. The increasing need for functional knowledge and skill for productive life shows that agricultural education can add values to the national development of any nation.

Agricultural education facilitates the acquisition of saleable skills and techniques in agriculture and productivity both in crops and animals. In Nigeria, there have been problems with human empowerment in relation to economic development and agriculture without doubt is the area to look to for adding values to the national development. Agriculture can be an asset in the area of employment generation, food security, increased national productivity, small-scale enterprise, women empowerment and youth organization and empowerment.

According to the National Policy on Education document, Agricultural Education programme is designed to give training and impart the necessary skills to individuals who shall be productive and self-reliant. World Bank (2014) underscores the fact that, Agricultural Education intends to provide students with knowledge and skills for increasing agricultural production and productivity. It is also expected to provide students with the skills they need to obtain employment and earn a sustainable livelihood. Vocational training is considered an essential element to create skilled workforce that is relevant to strengthening economic growth and lifting individuals and

communities out of poverty. Thus, the skills acquired through agricultural education contributes to agricultural growth and development since it deals with improved production and handling practices which guarantee quality of output, high productivity and food security. It also contributes to the transfer of agricultural technology, dissemination of innovations, farmers' education and enlightenment in both the urban centers and rural areas.

Akpe (2018), define skill acquisition as an education that focuses on the mastering of skills with emphasis on daily routine practices by the learners. Skills acquired and deployed in the performance of productive tasks efficiently are referred to psycho-productive skills. Psycho-productive skills refer to skills for performing tasks. Uzoka and Bayode (2010) stated that psycho-productive skills involve acquired abilities for performing tasks adequately with the muscles in response to sensory stimuli. This ability to perform well by an individual arises from a repetitive process in which skill holders engage in their jobs and it becomes a part of the individual to the extent that the performance becomes automatic. The implication is that the individual is never reminded before performing the skills step-by-step until the final product is obtained.

Fish farming according to Mathias (2008) is the process of rearing fish in an enclosed water body for industrial or domestic purposes. Ofuku (2006) reported that fish farming involves performance of certain management skills such as construction of fishpond, fish feeding, water management, fingerlings stocking, disease management and controlled harvesting of the matured fish (cropping). Fish production requires deliberate human intervention in the fish culture to result in yields that exceed those from their natural habitat. The sequence of development and managerial skills in fish farming has its unique technical expertise that must be learnt, practiced and acquired to be competent in fish farming (Ozigbo, Anyadike, Oluwatobi and Kolawole 2014).

According to Udoh, Offiong and Iwatt (2022), fish feeding is the process of supplying feeding material to fish in the pond. Feeding material supplied to fish in ponds is classified into two groups: natural food and artificial (formulated) feed. The natural feed are the organisms of plants and animals formed during pond fertilization and made available as natural feed especially at the fingerling stage. The artificial feed is the industrially formulated feed compounded using different varieties of feeding stuffs and pelleted into different sizes suited for the stages of fish development and growth (Udoh, Offiong and Okoko 2019). Fish feeds normally contain macronutrients like proteins, fats, fiber, trace elements and vitamins necessary to keep captive fish in good health; and depending on the type of system in which the fish is being reared (intensive, semi-intensive and extensive system), and the fish could be fed by natural or supplementary feeds or combination of both.

Pond water management is an important aspect of fish farming that ensures high productivity and provides conducive environment where fish are healthy and free from diseases. Skills in fish disease management are aimed at preventing the onset of disease and measures to reduce losses from disease when it occurs. For instance, stressors that trigger disease outbreak include; high water temperatures, high stocking densities, poor handling of fish, and an organically polluted culture environment. Antibacterial medication, reducing stocking densities, careful handling of fish, improving the culture environment through the use of clean pelleted feeds, and stocking of fish in cooler season of the year and vaccination are however important control measures (Roger, Barry and Richard 2011). Consequently, maintaining a good culture environment through use of proper management practices will reduce the risk of disease and increase production, fish quality, and marketability. Therefore, it is essential that

Agricultural Education students who are prospective fish farmers learn how to implement and follow good Aqua-culture management practices to ensure good quality and quantity yield.

The significant threat to food security and nutritional requirement of the rapid growing population of Nigeria by the fish production deficit necessitated this work to determine the influence of Agricultural Education fish demonstration farm on the acquisition of psycho-productive skills in fish feeding and disease management by undergraduate students in an attempt to tackle the man-power deficiency in the fish production industry.

PURPOSE OF THE STUDY

The main purpose of this study was to determine the influence of fish demonstration farm in the acquisition of psycho-productive skills in fish feeding and fish disease management by undergraduate students of Agricultural Education in tertiary institution in Akwa Ibom State.

Specifically, the study sought to:

- Determine the level of influence of fish demonstration farm in the acquisition of psycho-productive skills in fish feeding management by undergraduate students of Agricultural Education.
- Determine the level of influence of fish demonstration farm in the acquisition of psycho-productive skills in fish disease management by undergraduate students of Agricultural Education.

RESEARCH QUESTIONS

The following research questions were posed to guide the study:

- What is the level of influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management by undergraduate students of Agricultural Education?
- What is the level of influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management by undergraduate students of Agricultural Education?

RESEARCH HYPOTHESES

The following null hypotheses were formulated to guide the study:

- H_{01}: There is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education in the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management.
- H_{02}: There is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education in the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management.

RESEARCH METHOD

The study adopted a descriptive survey design. This design was considered appropriate because it enabled the researchers to collect data pertaining to the students' psycho-productive skills acquisition through the utilization of demonstration

farm by the use of structured questionnaire. In line with Uzoagulu (2011), this design enabled the researchers to assess the influence of fish production demonstration farm on the acquisition of psycho-productive skill in fish feeding and disease management by undergraduate students in tertiary institutions by sampling the opinion of respondents. The study area was Akwa Ibom State. Akwa Ibom was carved out of the then Cross-River State on 23th September, 1987. It is located in the coastal part of the country, lying between latitudes of $4^0$32'N and $5^0$33'N, and longitude $7^0$25'E and $8^0$25'E. The state that is located in the south-south geo-political zone shares boundaries with Cross River State on the east, Rivers State and Abia State on the west, the Atlantic Ocean on the south and Ebonyi state on the north (Akwa Ibom State Web Archive, 2024).

The population of the study consisted of 268 undergraduate students of tertiary institutions in Akwa Ibom State offering Agricultural Education Programme. Out of the eighteen tertiary institutions in Akwa Ibom State, sixteen of the institutions did not offer Agricultural Education programme while only two institutions (University of Uyo and College of Education, Afaha Nsit) had Agricultural Education as degree programme in their institution. Based on this factor, University of Uyo and Akwa Ibom State College on Education with 268 students constituted the suitable population for the study. Purposive sampling technique was employed to determine the sample size of 135 for the study, which constituted 85 students from 200 and 300 level offering Agricultural education practical courses in the University of Uyo and 50 Agricultural Education degree students from the College of Education, Afaha Nsit.

A psycho-productive skills acquisition structured questionnaire titled "Fish Demonstration Farm and Acquisition of Psycho-Productive Skills Questionnaire (FIDEFAPSQ)" was developed by the researcher to generate data for the study. Three experts, two from the Department of Agricultural Education and one from the Department of fishery and Aquacultural Development all in the University of Uyo subjected the instrument to face validation. Their corrections and inputs were incorporated to make the instrument of standard. The reliability of the instruments was determined using test-retest method and analyzed using cronbach's alpha statistic, which yielded a reliability coefficient of 0.78. Mean and standard deviation were used to answer the two research questions while the two research hypotheses were tested using independent t-test at 0.05 level of significance using statistical package for social science (SPSS). For answering the research question, decision was taken based on the table of real limit, which indicated a level of influence of fish demonstration farm on the acquisition of psycho-productive skills, by undergraduate students as shown below:

RESPONSE OPTION	VALUES	REAL LIMIT
Very Highly Competent	5	4.50 - 5.00
Highly Competent	4	3.50 - 4.49
Moderately Competent	3	2.50 -3.49
Lowly Competent	2	1.50 - 2.49
Very Lowly Competent	1	0.50 – 1.49

To test the null hypotheses, the p-value was compared with the Alpha value (level of significance) of 0.05. When the calculated p-value was less than or equal to the Alpha value ($p \leq 0.05$) the null hypothesis was rejected. On the other hand, when the

calculated p-value was greater than the Alpha value ($p \geq 0.05$) the null hypothesis was retained.

RESULT

Research Question one

What is the level of influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management by undergraduate students of Agricultural Education in tertiary institutions in Akwa Ibom State? Results of Research questions 1 are presented on Table 1

Table 1: Mean and Standard Deviation of the level of influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management by undergraduate students.

S/N	ITEMS	MEAN	SD	REMARK
I	can feed fish depending on size, age and metabolic condition based on skills acquired from my institution's fish farm.	3.26	.60	MC
2	I can culture natural fish food (zooplankton and phytoplankton) in the pond water based on skills acquired from my institution's fish farm.	2.99	.60	MC
3.	I can change fish feed according to their stage of growth based on skills acquired from my institution's fish farm.	2.84	.75	MC
4.	I can determine the nutritional requirement of fish at every stage of growth based on skills acquired from my institution's fish farm.	3.05	.62	MC
5.	I can consider the taste of the matured fish in my choice of a feed brand based on skills acquired from my institution's fish farm.	3.15	.90	MC
6.	I can feed in portions to facilitate observation of consumption rate based on skills acquired from my institution's fish farm.	3.39	.92	MC
7.	I can recording the daily feed amount to detect any drop in consumption based on skills acquired from my institution's fish farm.	3.09	.84	MC
8.	I can feeding frequently in small quantities based on skills acquired from my institution's fish farm.	3.27	.84	MC

Cluster Mean	3.130	.75	MC

MC – Moderately competence

Result on Table 1 shows that all skills studied as well as the cluster mean of the skills fell within the range of 2.50 – 3.49 on the Table of real limit, which indicates moderate competence of the level of acquisition of psycho-productive skills in fish feeding management by Agricultural Education students of tertiary institutions through their institution fish farm. The Table also indicated that the standard deviation values ranged from 0.59 to 0.92, which implies that the respondents were not divergent in their responses.

Hypothesis One

There is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management in Tertiary institutions in Akwa Ibom State.

Results of Research Hypothesis 1 are presented on Table 2

Table 2: t-test analysis of the influence of fish demonstration farm on the acquisition of Psycho-productive skills in fish feeding management by undergraduate students. N=135

N	Mean	SD	Df	p-value	Sig-level	Decision (p>0.05)
Male students	91	3.13	.28			
			133	0.41	0.05	NS
Female students	44	3.15	.23			

NS- Not significant

Result on Table 2 reveals the analysis of t-test for the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management. The result shows that the p-value of 0.41 at 133 degree of freedom was greater than 0.05 level of significance. Since the p-value of 0.41 was greater than the 0.05 level of significance, the null hypothesis which states that there is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management in Tertiary institutions in Akwa Ibom State was retained.

Research Question Two

What is the level influence of fish demonstration farm on the acquisition of psycho-productive skills in disease management by undergraduate students of Agricultural Education in tertiary institutions in Akwa Ibom State?

Results of research question 2 are presented on Table 3

Table 3: Mean and Standard Deviation of the level of influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management by undergraduate students.

S/N	ITEMS MEAN	SD		REMARK
1.	I can measure the level of dissolved oxygen in pond daily as it affect the fish health based on skills acquired from my institution's fish farm.	3.25	.90	MC
2.	I can use high quality feed which provides fish with the nutrients needed for healthy and rapid growth based on skills acquired from my institution's fish farm.	3.33	.92	MC
3.	I am familiar with the normal behaviour of the cultured fish which makes me identify the abnormal behavior based on skills acquired from my institution's fish farm.	3.52	.99	HC
4.	I can daily monitor water quality and the fish feeding pattern to ascertain their health state based on skills acquired from my institution's fish farm.	3.42	1.04	MC
5.	I can add medicinal plants to the pond water to boast the immune system of fish and prevent disease based on skills acquired from my institution's fish farm.	3.55	1.00	HC
6.	I can add antibiotics to feed as a preventive measure to disease based on skills acquired from my institution's fish farm.	3.50	1.03	HC
7.	I can Properly handle fish during sorting/grading to prevent stress based on skills acquired from my institution's fish farm.	3.31	1.28	MC
8.	I can regularly disinfect pond to prevent pathogenic organisms' growth based on skills acquired from my institution's fish farm.	3.07	.76	MC
9.	I can properly store feed to prevent fungal growth based on skills acquired from my institution's fish farm.	3.12	.69	MC
Cluster Mean		3.34	0.95	MC

HC- Highly competence; MC – Moderately competence

Result presented in Table 3 shows that apart from item 3, 5 and 6 with 3.51, 3.55 and 3.50 indicating high competence, all other skills studied had their mean values within the moderately competent range of 2.50 - 3.49 on the Table of real limit of acquisition of psycho-productive skills in fish disease management by Agricultural Education students of tertiary institutions through their institution fish farm. The cluster mean of 3.34 also showed moderate skill competence. The Table also indicated that the standard deviation values ranged from 0.70 to 1.27 which implies that the respondents were not divergent in their responses.

Hypothesis Two

There is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm in the acquisition of psycho-productive skills in fish disease management in Tertiary institutions in Akwa Ibom State.
Results of Research Hypothesis Two are presented on Table 4

Table 4: t-test analysis of the influence of fish demonstration farm on the acquisition of Psycho-productive skills in pond water management. N=135

N	Mean	SD	DF	p-value	Sig-level	Decision(p>0.05)
Male students	91	3.34	.24			
			133	0.17	0.05	NS
Female students	44	3.34	.31			

NS – Not significant

Result on Table 4 reveals the analysis of t-test for the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management. The result shows that the p-value of 0.17 at 133 degree of freedom was greater than the 0.05 level of significance. Since the p-value of 0.17 was greater than the 0.05 level of significance, the null hypothesis which states there is no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management in Tertiary institutions in Akwa Ibom State was retained.

DISCUSSION

Influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management

Findings of this study as presented on Table 1 (research question 1) shows that there was moderate competence in the acquisition of psycho-productive skills in fish feeding management among undergraduate students of Agricultural Education in

tertiary institutions in Akwa Ibom State. Results of research hypothesis 1 on Table 2 also indicated that there was no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish feeding management in Tertiary institutions in Akwa Ibom State. This may be attributed to the fact that at the demonstration farm, the students could gain fish feeding management skills through learning by practice, observation and shared ideas. The findings are in agreement with the findings of Lamidi (2016) who reported that feeding management practice skills are required by farmers for effective human and materials resource management in fish production for sustainable livelihood. Findings of the study also aligns with the observation of Sseguya, Robinson, Mwango, Flock, Manda and Abed (2021) who reported that access to demonstration plots increased the probability of purchasing improved inputs by 13–17 percentage points. Feed management skills are crucial in avoiding wastage of feed.

Influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management

Findings of this study as presented on Table 3 (research question 2) shows that there was moderate competence in the acquisition of psycho-productive skills in fish disease management among undergraduate students of Agricultural Education in tertiary institutions in Akwa Ibom State. Results of research hypothesis 2 on Table 4 indicated that there was no significant difference in the mean responses of male and female undergraduate students of Agricultural Education on the influence of fish demonstration farm on the acquisition of psycho-productive skills in fish disease management in Tertiary institutions in Akwa Ibom State. The result may have been triggered by the fact that continuous practice of disease management through the fish demonstration farm enhances students' ability to identify, prevent, control and treat fish diseases. A lack of practical experiences may result in a lack of proficiency in handling disease outbreaks thereby resulting in high mortality rate losses.

The findings are in consonance with Francis-Floyd (2013) who stated that fish is constantly bathed in potential pathogens, including bacteria, fungi, and parasites and suboptimal water quality, poor nutrition, or immune system suppression generally associated with stressful conditions which allow these potential pathogens to cause disease. This calls for up-skilling in fish disease management for profit maximization through reduction in mortality.

CONCLUSION

On the basis of the findings of the study, it was therefore concluded that fish demonstration farm influences the acquisition of psycho-productive skills by agricultural education students and that practical activities through demonstration method should be utilized by Agricultural Education teachers in teaching so as to equip the students with psycho-productive skills for self-employment. This will foster skill acquisition, which is the core objective of the Vocational Agricultural Education programme.

RECOMMENDATIONS

It is recommended based on the findings of this study that:

- Agricultural Educationist should select and adopt instructional approaches and strategies that would involve the use of demonstration farms in delivering of course contents to foster skill acquisition in fish feeding and fish disease management.
- Vocational training in Agricultural Education should be given more priority in terms of time allocation to enhance effective psycho-productive skills acquisition in fish feeding and fish disease management.

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