

TECHNICAL INFORMATION NEEDS OF TEACHERS OF AGRICULTURAL SCIENCE ON FISHERY FOR EFFECTIVE TEACHING OF STUDENTS IN SENIOR SECONDARY SCHOOLS

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ABSTRACT

Objectives: This study determined the technical information needs of teachers of agricultural science on fishery for effective teaching of students in senior secondary schools.

Methods: The study adopted survey research design. The study was carried out in Enugu States of made up of six education zones. The population for the study was 484 teachers of agricultural science made up of 218 male and 266 in 286 registered secondary schools in Enugu State. The sample for the study was 145 teachers. A 40-structured item questionnaire titled: Fishery Teachers Technical Information Needs Questionnaire was used for data collection. Three experts validated the instrument. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire items which produced a coefficient index of 0.89.

Results: It was found that teachers need technical information on 15 contents of fishery, have only 3 reliable sources of technical information to teachers on fishery and 10 constraints to accessing technical information on fishery for effective teaching of students in secondary schools.

Conclusion: It was concluded among others that teachers of agricultural science should attend seminars, workshops and conference on fishery to improve their technical information for effective teaching of students in secondary.

Keywords: Effective teaching, Fishery, Technical information, Teachers of agricultural science.

INTRODUCTION

There is no doubt that the major difference between a teacher and a student, old and young counsellor and counselee, bank manager and gatekeeper is not just physical stature but information possessed by each person. This is why the philosophical saying that information is power is a general belief in all discipline including fishery in secondary schools. Recently, in the Nigeria, the Federal Ministry of Education reviewed the curriculum of secondary school, making fishery as single subject in senior secondary schools. In response to the directive of the Federal Ministry of Education [1], developed senior secondary school curriculum on fishery as a trade. The objectives of fishery in the curriculum are as follows:

1. For students to have fishery as a trade for livelihood on completion of fish studies;
2. To produce fish that will increase the nutritive value of man's diet;
3. To be able to meet with the gap between the demand for fish and its supply; and
4. To bridge the gap between poverty and hunger.

In any case, the pioneer students of this curriculum graduated in 2014 with very low achievement in the senior secondary school external examinations. Asogwa *et al.* [2] revealed that about 94% of the secondary school graduates lacked the entrepreneurial skills to embark on any fishery occupations such as fish production, processing, preservation and marketing which was one of the objectives of the curriculum review. Meanwhile, their observation was in conformity with [3] that only 48% of senior secondary school students passed fishery in Nigeria including Enugu State. This is an indication that the teaching of fishery to students by teachers of agricultural science is not effective since the graduates cannot engage in fish production as a trade for livelihood on completion of secondary education. It implies that the aim of the Federal Government to avert the existing gap between the quantity of fish demanded and the quantity supplied to the market, may not be met

if the present standard of teaching fishery in secondary by teachers of agricultural science is allowed to continue without improvement.

Teaching is a conscious and deliberate attempt by mature and experience persons to impart information, knowledge, skills, attitude, values, and habits to less or inexperience and immature person with the intention of bringing about learning [4]. It is a systematic process of transmitting knowledge, attitudes, and skills to students in accordance with professional principles. Teaching is a process by which a teacher guides the learner in the acquisitions of knowledge, skills and attitude [5]. According to Asogwa [6], it is a process by which a more experience person (teacher) deliberately exposes the less experience person (leaner) to a planned activity and opportunity in a discipline to enable him acquire knowledge, skills, attitude, values and habits that will make him become useful to himself and the society. Therefore, teachers of agricultural science, in this context, are individuals who through certified training acquired more experience and deliberately expose students to planned activities and opportunity in fishery to enable them acquire knowledge, skills, and habits that will enable them embark on fish production as a trade on graduation. A teacher is a facilitator of information acquisition in school subjects such as fishery. Besides Isani [7], reported that teachers of agriculture generally lacked requisite competencies to teach animal production such snailry, piggery, poultry, fishery to students in secondary schools in Otuocha Educational Zone of Anambra State.

In Enugu State, most teachers of agricultural science who are currently teaching fishery to students were trained before the introduction of fishery as a single subject. This implies that their preparation in the university may not have been in line with the new curriculum neither were they given any in-service training to improve their capacity in term of technical information for effective implementation. This might be the major reason for the students' low competence and inability to establish fish production as a trade on graduation after being

exposed to curriculum content of fishery in the secondary schools. However, a situation whereby teachers implement a new curriculum without retraining contradicts the assertion of Ogwo and Oranu [8] that for teachers of vocational education to be effective, they need to be constantly upgrading their knowledge for currency, relevance, and effective performance in their profession. In addition, Olaitan *et al.* [9] stated that due to continuous technological advancement, teachers need to be upgrading their technical (subject-matter) knowledge continuously for effectiveness. It is on this premise that the researcher is convinced that the technical information possessed by teachers of agricultural science on fishery in Enugu State is obsolete and needs upgrading since most of them were trained many years ago that has recorded several advancements in technologies.

Information is described by Dretske [10], as what is capable of yielding knowledge and knowledge is relative to pre-knowledge. McCreddie and Rice [11] summarized the concepts of information proposed over the last 50 years as a representation of knowledge which may be stored; data in the environment which can be obtained from a range of environmental stimuli and phenomena, not all of which are intended to "convey" a message, but which can be informative when appropriately interpreted; part of the communication process liable to processing and interpretation; and a resource or commodity which may be transmitted in a message from sender to receiver. Also Madden [12] defined information as an item of intelligence; a fact or circumstance of which one is told. The author emphasized that no information conveyed from a sender to a receiver ever remain the same.

Therefore, conceptualizing information, in this study, as acquired knowledge, collected facts, and data on fishery, means that technical information refers to acquired knowledge, collected facts and data that is industrially and scientifically applied in fishery as a trade. U.S. Office of Personnel Management [13] explained that technical information relates to having special knowledge, especially of how machines work, how a particular kind of work is done and the practical use of machines or science in industry. Educationally, U.S. Office of Personnel Management [13] clarified that technical information is associated with teaching practical skills rather than ideas about literature, art among others. Meadow and Yuan [14] noted that what distinguishes technical information works from that of professional information is the particular combination of knowledge and skills required. First, technical information work requires a practical knowledge of one or more functions in information processing, which may or may not be similar to typical professional functions. This knowledge is usually acquired on the job or through training courses. Second, the author added that technical information work requires considerable subject-matter knowledge, either in a recognized discipline such as biochemistry, mathematics, fishery or in a broader subject field such as education policy, weapon systems, or information technologies.

In contrast, technical information in fishery is distinguished from other types of professional information by the dual requirement for subject-matter knowledge and practical knowledge of information processes. The technical information needs of teachers relate to what they require to acquire special subject-matter knowledge and practical skills for teaching fishery to students rather than only ideas and theory in secondary schools. It also entails their understanding of the particular content they need technical information, the reliable sources of technical information and what prevents them from accessing the technical information on fishery. This is because he lacks information on what he needs, where to search for what he needs and what prevents him from getting what he needs may not get to his destination at all. Therefore, to determine the technical information needs of teachers on fishery, it is necessary to identify:

- i. Contents of fishery in secondary school where teachers need technical information for effective teaching of students in secondary schools;
- ii. Reliable sources of technical information to teachers on fishery for effective teaching of students in secondary schools; and

- iii. Constraints to teachers' accessibility to technical information on fishery for effective teaching of students in secondary schools.

Research questions

1. What are the contents of fishery in secondary school where teachers need technical information for effective teaching of students in secondary schools?
2. What are the reliable sources of technical information to teachers on fishery for effective teaching of students in secondary schools?
3. What are the constraints to teachers' accessibility to technical information on fishery for effective teaching of students in secondary schools?

Hypotheses

There is no statistically significant difference in the mean rating of male and female teachers of agricultural science on the:

1. Contents of fishery in senior secondary school where teachers need technical information;
2. Reliable sources of technical information to teachers in fishery; and
3. Constraints to teachers' accessibility to technical information in fishery.

METHODS

Three research questions were answered for the study. The study adopted survey research design. This research design was suitable for the study because questionnaire was used to collect data from a representative of teachers and the results were generalized up on the entire teachers of Agricultural Science in Enugu State. The study was carried out in Enugu States of made up of six education zones namely Agbani, Awgu, Enugu, Nsukka, Obollo-afor, and Udi [15]. The population of the study was 484 teachers of agricultural science made up of 218 male and 266 in 286 registered secondary schools in Enugu State. About 145 teachers representing (30%) were proportionately randomly selected from the entire population of the teachers.

A 40-structured item questionnaire titled: Fishery Teachers Technical Information Needs Questionnaire (FTINQ) was developed by the researchers from literature reviewed and used for data collection. The questionnaire was divided into two parts A and B. Part A solicited information on personal data of the respondents, while Part B had 3 sections which obtained teachers' opinion on the contents of fishery, reliable sources of technical information, and constraints to teachers' accessibility to technical information on fishery. The three sections of section B had a four-point response option of strongly agreed, agreed, disagreed, and strongly disagreed with corresponding value of 4, 3, 2, and 1, respectively. Three experts validated the instrument, one from Department of Fisheries and Aquatic Resource Management, one from the Department of Agricultural Education of Micheal Okpara University of Agriculture, Umudike, Abia State, and one teacher of Agricultural Science in Enugu State. The observations and suggestions of the validates were used to develop the final copy of the FTINQ used for data collection. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire items which produced a coefficient index of 0.89, meaning that the instrument was reliable and valid for the study.

About 145 copies of the FTINQ were administered to the respondents by the researcher and six research assistants who were familiar with the six education zones in Enugu State. But 138 copies of the FTINQ were retrieved and analyzed using weighted mean produced from Statistical Package of Social Science (SPSS, version 16.0) to answer the research questions and t-test to test the null hypotheses at 0.05 level of significance. The cut off point for decision making was a mean of 2.50, which means that any item with a mean value of 2.50 or above was regarded as agreed while any item with a mean <2.50 was regarded as disagreed. In testing the hypotheses, a null hypothesis of no statistically significant difference was not rejected where p value was greater than the alpha value of 0.05, but rejected where p value was less than the alpha value of 0.05.

RESULTS

The results of this study were obtained from the research questions answered using data collected and analyzed.

Data in Table 1 show that 15 out of 17 items had their mean values ranged from 2.55 to 4.00 and were above the cutoff point 2.50. This indicated that the respondents agreed that all the 15 items were the contents of fishery where teachers need technical information for effective teaching of students in secondary schools. Data in Table 1 also show that 2 out of 17 items had their mean values ranged from 2.12 to 2.43 and were below the cutoff point 2.50. This indicated that the respondents agreed that all the 2 items were the contents of fishery where teachers do not need technical information for effective teaching of students in secondary schools. Table 1 also showed that the standard deviations (SD) of all the 17 items ranged from 0.03 to 0.96 which indicated that the respondents were not very far from the mean and one another in their responses.

Table 1 also showed that all the 17 items had their p values ranged from 0.07 to 0.95 which were greater than the alpha value of 0.05. This indicated that there is no significant difference in the mean rating of the responses of the two groups of teachers of agricultural science on contents of fishery where teachers need and do not need technical information for effective teaching of students in secondary schools. Therefore, the null hypothesis of no statistically significant difference in the mean rating of the responses of the two groups of teachers of agricultural science on contents of fishery where teachers need and do not need technical information for effective teaching of students in secondary schools was not rejected.

Data in Table 2 shows that 3 out of 13 items had their mean values ranged from 3.12 to 4.00 and were above the cutoff point of 2.50. It also showed that 10 out of 13 items had their mean values ranged from 1.37 to 2.45 and were below the cutoff point 2.50. This indicated that the respondents agreed that the 3 items were the reliable sources of technical information to teachers on fishery but the rest 10 items were not reliable sources of technical information to teachers on fishery in secondary schools. Table 2 also showed that the SDs of all the 13 items ranged from 0.18 to 0.84 which indicated that the respondents were not very far from the mean and one another in their responses.

Table 2 also showed that all the 13 items had their p values ranged from 0.10 to 0.78 which were greater than the alpha value of 0.05. This indicated that there is no significant difference in the mean rating of the responses of the two groups of teachers of agricultural science on reliable sources of technical information to teachers on fishery in secondary schools. Therefore, the null hypothesis of no significant

difference in the mean rating of the responses of the two groups of teachers of agricultural science on reliable sources of technical information to teachers on fishery for effective teaching of students in secondary schools was not rejected.

Data in Table 3 show that all the 10 items had their mean values ranged from 3.00 to 3.74 and were above the cutoff point of 2.50. This indicated that the respondents agreed that all the 10 items were constraints to teachers' accessibility to technical information on fishery in senior secondary schools. Table 3 also showed that the SDs of all the 10 items ranged from 0.07 to 0.93 which indicated that the respondents were not very far from the mean and one another in their responses.

Table 3 also showed that all the 10 items had their p values ranged from 0.09 to 0.68 which were greater than the alpha value of 0.05. This indicated that there is no significant difference in the mean rating of the responses of the two groups of teachers of agricultural science on constraints to teachers' accessibility to technical information on fishery in secondary schools. Therefore, the null hypothesis of no statistically significant difference in the mean rating of the responses of the two groups of teachers of agricultural science on constraints to teachers' accessibility to technical information on fishery for effective teaching of students in secondary schools was not rejected.

DISCUSSION OF RESULTS

The result in Table 1 is in line with the observation of Hayani and Peterson [16], who noted that basic technical information needs of livestock farmers are concerned with nutrition, healthcare, reproduction, management systems and practices, breeding, livestock extension services, and processing and preservation. Adene and Oguntade [17] stated that poultry farmers need information on management practices such as housing, feeds and feeding, health care, and stock selection. Kaka'an [18] found that small ruminant and poultry farmers need technical information on 9 areas which include nutrition, reproduction, healthcare, improved breeds, housing, management systems, and practices.

The result in Table 2 is in disagreement with the finding of Agwu and Adeniran [19] that farmers perceived extension agents, radio and television as the most reliable sources of information on farm matters; newspapers, public campaign, opinion leaders, friends and neighbors, women cooperative societies, film/slide shows, bulletin, bill board/posters, drama, telephone and internet as reliable sources of information by the farmers and electronic mail and text message as not reliable channels of disseminating agricultural information.

Table 1: Mean ratings and t-test analysis of male and female teachers of agricultural science on contents of fishery where teachers need technical information (N=138)

S. No.	Content	Mean±SD	p value	Remark
1	Introduction to fisheries	2.32±0.17	0.78	Disagreed*
2	Importance of fish	2.12±0.07	0.18	Disagreed*
3	Capture fishery	3.35±0.09	0.07	Agreed*
4	Culture fishery	3.41±0.29	0.18	Agreed*
5	Types of fish ponds	2.55±0.39	0.29	Agreed*
6	Culture systems	3.72±0.12	0.37	Agreed*
7	Monitoring water quality	3.43±0.81	0.39	Agreed*
8	Fish feed materials	3.01±0.22	0.56	Agreed*
9	Fish feeding	3.10±0.37	0.75	Agreed*
10	Pond preparation	2.90±0.48	0.78	Agreed*
11	Pond management	3.19±0.96	0.36	Agreed*
12	Materials and methods for harvesting fish	2.91±0.82	0.11	Agreed*
13	Post-harvesting processing	3.32±0.17	0.86	Agreed*
14	Brood stock selection and handling	3.51±0.07	0.93	Agreed*
15	Artificial breeding	4.00±0.03	0.16	Agreed*
16	Managing and nursery fish feeding	3.35±0.49	0.39	Agreed*
17	Tools and equipment in fishery	2.73±0.29	0.56	Agreed*

N: Number of respondents, SD: Standard deviation, Sig.: Significant value, p≥0.05, *Not significant

Table 2: Mean ratings and t-test analysis of male and female teachers of agricultural science on reliable sources of technical information to teachers in fishery (N=138)

S. No.	Sources	Mean±SD	p value	Remark
1	Newsletters/leaflet	1.37±0.74	0.13	Disagreed*
2	Seminar, workshop or conference	2.32±0.81	0.23	Disagreed*
3	Textbooks	4.00±0.05	0.35	Agreed*
4	Journal	2.26±0.38	0.47	Disagreed*
5	Internet	3.12±0.29	0.75	Agreed*
6	Extension agents	2.29±0.53	0.56	Disagreed*
7	Research institutes	2.31±0.17	0.61	Disagreed*
8	Radio/television	2.35±0.40	0.13	Disagreed*
9	Bulletin	2.30±0.84	0.40	Disagreed*
10	Friends/relations	2.26±0.35	0.10	Disagreed*
11	Fellow teachers	3.24±0.46	0.49	Agreed*
12	Exhibition	2.05±0.18	0.78	Disagreed*
13	Fieldtrip	2.45±0.50	0.33	Disagreed*

N: Number of respondents, SD: Standard deviation, Sig.: Significant value, p>0.05, *Not significant

Table 3: Mean ratings and t-test analysis of male and female teachers of agricultural science on constraints to accessibility of technical information on fishery (N=138)

S. No.	Constraints	Mean±SD	p value	Remark
1	Scarcity of sources of technical information	3.00±0.84	0.48	Agreed*
2	Inadequate information on where to search for source of technical information on fishery	3.65±0.93	0.49	Agreed*
3	Inability to develop relationship with fellow teachers to source technical information	3.18±0.15	0.10	Agreed*
4	High cost of sources of technical information like textbooks	3.76±0.07	0.09	Agreed*
5	Limited time for accessing technical information	3.38±0.27	0.45	Agreed*
6	Lack of electronic gadgets to access technical information	3.74±0.66	0.68	Agreed*
7	Computer illiteracy to access information from electronic gadgets	3.11±0.37	0.35	Agreed*
8	Inconsistency in technical information flow from the sources	3.40±0.54	0.44	Agreed*
9	Contradictions on technical information for different sources	3.32±0.49	0.18	Agreed*
10	Constant change of technical information in fishery	3.49±0.09	0.54	Agreed*

N: Number of respondents, SD: Standard deviation, Sig.: Significant value, p>0.05, *Not significant

The result of the study in Table 3 was affirmed by Agwu and Adeniran [19] who found that problems associated with farmers' receiving information on new technologies through different communication sources are language used in presenting the information, inability to ask questions and quick few back, lack of time to listen to agricultural information, innovation difficulty/complexity of understanding, lack of interest, lack of money to acquire information sources, illiteracy, insufficient contents with the extension agents. Besides, the findings has the support of Obidike [20] who found that constraints encountered by the Nsukka rural farmers in access to agricultural information from their community include poor public relation of the extension workers, inability to read and write (illiteracy), poor radio and television signals, lack of rural electrification/constant power interruption in communities that have electricity supply, lack of access roads for easy community visit of extension workers, and lack of money to purchase newsletters, leaflets on agricultural information. Also Ronald *et al.* [21] found that the problems or barriers to farmers accessing agricultural information through information sources in the study area were associated with inadequate funds, lack of information services, poor infrastructure, inadequate extension agents, lack of reading culture, poor infrastructure, and poor knowledge sharing culture. The findings of the authors helped to add credence to the result of this study.

CONCLUSION

The rapid and continuing technological change increases the demand on teachers of agriculture in fishery for short- and long-term retraining. The teachers continually need to evaluate technical information and new technological tools in fishery, and to try to anticipate the next development and its effect on information access. However, research has shown that the teachers' level of implementation of fishery in secondary schools is low and need improvement. It was in a bid to ascertain on the content of fishery where the teachers of agricultural science need technical information that leads the researcher into this

study. It was found that teachers of agricultural science need technical information on 15 contents of fishery in secondary schools, have only 3 reliable sources of technical information on fishery and experience 10 constraints to accessing technical information on fishery for effective teaching of students in secondary. Based on the findings of the study, it was therefore, concluded that teachers of agricultural science need technical information on the contents of fishery for effective teaching of students in secondary. The recommendation was that teachers of agricultural science should:

1. Attend seminars, workshops and conference in fishery to improve their technical information on fishery for effective teaching of students in secondary;
2. Exploit other reliable sources of technical information like field trip, extracts from fishery department in research institutes, journal, and newsletters in fishery;
3. Create more time for accessing technical information on fishery to upgrade their competence for effective teaching of students in secondary; and
4. Request the government through the schools authority to subsidize the cost of sources of technical information such as textbooks, internet, journal, newsletters and so on for easy acquisition.

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