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Teaching Mathematics for the Development of Agricultural System in Rivers State of Nigeria

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Abstract:

Mathematical knowledge is a solution to many problems of life. Teaching of Mathematics is a way to acquire all skills needed in practical activities of agricultural system. This study examined effect of Mathematics teaching and challenges militating against teaching of Mathematics for the development of agricultural system. Four research questions guided the study, the instrument used was a questionnaire developed by the researchers. The data collected were analysed using mean statistics. The result showed that teachers were using more of problem-solving method which may help in developing mathematical skills relevant for development of agricultural system. However, the study showed that the poor attitude of teachers towards teaching of Mathematics has been the highest challenge confronting the teaching of Mathematics for the development of agricultural skills. Thus, the researcher recommended among others that Mathematics teachers should have positive attitude towards teaching.

Keywords: Agricultural science, agricultural system, mathematics, mathematical skills

1. Introduction

The three basic needs for man to survive are food, cloth, and shelter. Of these three the most essential is food. Food security is a major index in sustainable development and continual human existence (Enweze, 2006) as cited in (Uwaezuoke 2014). All these are made from agricultural system and it helps people to enjoy life at higher standard of living. Agricultural system is the science, art and business of cultivating soil, producing crops and raising livestock (free dictionary 2015). Agriculture involves tilling the soil, cultivating crops, rearing of animals for food and other purposes and sales of produce. Agriculture is the process of producing food, feed, fibre and many other desired products by the cultivation of certain plants and the raising of domesticated animals, (Science Daily, 2015).

On the other hand, Agricultural system has contributed immensely to the development of the society. For instance, agriculture provides food for man. Food is needed by man for growth and repair of body cells, energy and vigour. Some of the agricultural products gotten from plants and animals that are used for food include fruits, vegetables, roots, tubers, cereal, legumes, fish, meats, eggs, milk, and their products. Also agriculture provides shelter for man. We need shelter to protect us from adverse weather conditions like rain, sunshine, heat, cold, and wind. Shelter also protects us from wild animals. Wood from trees is used as building materials and for making chairs, tables etc. while leaves, palm fronds are used for roofing. It also serves as a means of income and job creation, it provides income to farmers when they sell their farm products like maize, tomatoes, yam, cassava etc. The importance of agriculture to individual, family, group, society and nation cannot be over emphasized. Despite the importance of agriculture and its products to man and national development, low food production and lack of food has been the number one challenge confronting national development in Nigeria. This is as a result of the following

- Poor soil analysis
- Inaccurate calculation of various fertilizer contents
- Poor estimation of areas of various shapes
- Inappropriate market protection strategies
- Poor evaluation of retailer performance
- Inappropriate finance decisions

This would not have been so if there was proper application of mathematical skills to agricultural system.

Mathematics is the study of the measurement, relationships and properties of quantities and sets (Ekwueme 2013). Mathematics is the tool for analysing and explaining concepts. Mathematics will be taught primarily for its practical values and aims (Sidhu 2012). Making the teaching of Mathematics exciting is passion which every Mathematics teacher needs (Ogunkunle 2014). However, agriculturists need mathematical skills in all steps of farming, for instance; soil analysis, evaluation of various fertilizer contents, foreign markets, conversions to/from metric, area of various shapes, market protection strategies, evaluation of retailer performance, application rates, finance decision etc.

Abakpa and Agbo (2014) stated that Mathematics is taught and studied in schools for aesthetic and utilitarian. Utilitarian aim gives learner mathematical knowledge and skills needed in day-to-day life and makes the study of Mathematics to establish relationship between the subject and practical life.

Insufficient food production in the nation as a result of poor application of Mathematical skills and knowledge has posed a great concern to the citizens of our nation, Nigeria. For Instance, the quantity and quality of some of agricultural produce especially farm produce found in Nigeria market shows that the right proportion of factors needed for their growth have not been properly administered. Unfortunately, the little harvest that are yielded are been given out at high prices which cannot be afforded by all.

However, the major focus of this study was to examine how Mathematics teaching would develop agricultural system in Rivers State of Nigeria. Specifically, the objective was

- (1) To examine the methods employed in teaching Mathematics in the secondary schools for the development of agricultural system.
- (2) To determine the basic Mathematical skills relevant for the development of agricultural skills.
- (3) To identify challenges confronting the teaching of Mathematics for the development of agricultural system in Rivers State of Nigeria.
- (4) To examine the effect of Mathematics teaching on agricultural system.

2. Research Questions

The following research questions guided the study;

1. What are the methods employed in teaching Mathematics in the secondary schools for the development of agricultural system?
2. What are the basic mathematical skills relevant for the development of agricultural skills?
3. What are the challenges confronting teaching Mathematics for the development of agricultural system in Rivers State of Nigeria?
4. What are the effects of Mathematical skills on agricultural system?

3. Methods

The population for this study comprised a purposive subset of the population of teachers in secondary schools in Rivers State of Nigeria, which included Agricultural Science teachers and Mathematics teachers. 70 Agricultural Science teachers and 70 Mathematics teachers were selected using simple random sampling from 25 secondary schools in Port Harcourt local government area.

The instrument used for data collection was questionnaire. A 13-item questionnaire was for Mathematics teachers and 12-item questionnaire was for agricultural Science teachers. The questionnaire was divided into three sections; section A contained information on respondents, section B solicited information on methods of teaching Mathematics in secondary schools, and challenges confronting teaching of Mathematics for the development of Agricultural system in rivers state while section C sought information on basic Mathematical skills relevant for development of agricultural system and effects of Mathematical skills on agricultural system. The instrument was validated by two experts, one Mathematics educator and one lecturer from the department of Agricultural science, University of Port Harcourt. The instruments were personally administered by the researchers and 100% retrieval was obtained and used for the analysis.

The research questions were analysed using mean. Mean rating statistics of strongly agree (SA) =4points, Agree (A) =3points, Disagree =2points (D) and strongly disagree (SD)=1pointwas utilised. A criterion mark of2.5 was adopted for decision making, hence a calculated mean greater than or equal to2.5 is accepted while a calculated mean less than 2.5is rejected

4. Results

- Research question 1: What are the methods employed in teaching Mathematics in the secondary schools for the development of agricultural system?

S/N	Teaching method	SA	A	D	SD	Total	Mean	Decision
1	Analytic	92	42	38	13	185	2.6	Accepted
2	Laboratory	16	21	52	33	122	1.7	Rejected
3	Demonstration	68	63	36	14	181	2.6	Accepted
4	Problem- solving	104	99	14	4	221	3.2	Accepted
5	Project method	16	27	68	21	132	1.9	Rejected
Purpose of teaching mathematics								
6	To be known as a Mathematics teacher	—	9	38	48	95	1.4	Rejected
7	To develop Mathematical skills in the students	176	78	—	—	254	3.6	Accepted
8	To finish the Mathematics syllabus	60	69	36	14	179	2.6	Accepted

Table 1: responses to items 1 – 8(N=70)

Results from table 1 show that analytic, demonstration and problem- solving methods are more used in Mathematics class than other methods. Likewise, teaching to develop Mathematical skills in the students and finish the Mathematics syllabus were the Mathematics teacher's priority.

- Research question 2: What are the basic Mathematical skills relevant for development of agricultural system?

S/N	Mathematical skills	SA	A	D	SD	Total	Mean	Decision
9	Measurement skills	152	96	—	—	248	3.5	Accepted
10	Problem – Solving Skills	64	81	44	16	205	2.9	Accepted
11	Conversion skills	124	99	8	2	233	3.3	Accepted
12	Manipulation skills	12	24	76	21	133	1.9	Rejected
13	Basic arithmetic skills	104	96	16	4	220	3.1	Accepted

Table 2: responses to items 9 – 13 (N=70)

Results from table 2 indicated that measurement skills, problem- solving skills conversion skills, basic arithmetic skills are relevant to the development of agricultural system.

- Research Question 3: What are the challenges facing teaching of Mathematics for the development of agricultural skills?

S/N	Problem	SA	A	D	SD	Total	Mean	Decision
14	Poor attitude of teacher towards teaching of mathematics	96	84	28	4	212	3.0	Accepted
15	Rush to finish the syllabus	84	51	38	13	186	2.7	accepted
16	Insufficient teaching aids	76	72	36	9	193	2.8	Accepted
17	Large class size	80	81	26	10	197	2.8	Accepted
18	Integration of technology	36	48	50	20	132	2.2	Rejected

Table 3: responses to items 14 – 18 (N=70)

Result from table 3 shows that integration of technology is not a challenge of teaching mathematics. However, poor attitude of teacher towards teaching of Mathematics which is fuelled by the rush to finish the syllabus, insufficient teaching aids and large class size are challenges confronting the teaching of Mathematics for the development of agricultural system.

- Research question 4. What are the effects of Mathematical skills on agricultural system?

S/N	Effects of Mathematical skills on agricultural system	SA	A	D	SD	Total	Mean	Decision
19	A good farmer should keep farm records.	84	126	10	1	221	3.2	Accepted
20	A farmer should know total input in production.	80	66	22	6	174	2.5	Accepted
21	Mathematical skills are needed in spacing the cultivated crops	104	93	12	7	216	3.1	Accepted
22	Mathematical skills cannot be applied in agriculture.	—	—	38	51	89	1.3	Rejected
23	Fertilizer application are usually in specified scales of measurement	116	93	14	3	226	3.2	Accepted
24	Addition and subtraction are essential skills in agriculture	112	96	12	4	224	3.2	Accepted
25	It is not necessary for a farmer to do soil analysis	16	27	52	31	126	1.8	Rejected

Table 4: responses to items 19 – 25(N=70)

Result from table 4 shows that items 19, 20, 21, 23 and 24 with average mean of 3.04 were accepted while items 22 and 25 with average mean of 1.55 were rejected. This shows that mathematical skills have great effect on agricultural system.

5. Discussion

The findings in table 1 showed that Mathematics teachers adopt demonstration and problem solving methods of teaching Mathematics. According to Sidhu (2012) problem solving method is a suitable teaching method for Mathematics which is a subject of problems. It helps the teacher to know the difficulties which the students face and help them accordingly. However, poor attitude of teacher towards teaching of Mathematics was shown by table to inhibit the effectiveness of the problem solving method: this is fuelled by the rush to finish the syllabus, insufficient teaching aids and large class. This shows that students are not receiving adequate mathematical skills required for application other subject areas such as Agricultural Science.

Though the teacher may adopt appropriate teaching method, some challenges are facing the effective development of agricultural skills. Insufficient teaching aids and large class size hinder the development of measurement and conversion skills. The result from table 4 showed that mathematical skills have great effect on agricultural produce.

Solid foundation in Mathematics will help in developing agricultural system. The Agricultural system requires Mathematics in every aspect of its practical activities and teaching at all levels. Proper teaching of Mathematics will help student to develop skills needed in practicing agricultural system in which the coming agriculturist can apply. Mathematical skills like measurement and conversion are very important in agriculture system in order to have quality and quantity produce. (Uwaezuoke 2014) stated in his work that through simple measurements, the farmer can estimate the number of hectares cultivated per annum, his profit and loss margin per annum etc. Attitude of Mathematics teachers is very important teaching of mathematics. Abakpa and Agbo-Egwu (2014) stated that if Mathematics teachers deliver their lessons effectively, every learner will be able to apply these skills in appropriate decisions for future investments.

6. Conclusion

From the findings of this study, it is concluded that poor attitude of teacher towards teaching of Mathematics which is fuelled by the rush to finish the syllabus, insufficient teaching aids and large class sizes, are challenges confronting the teaching of Mathematics for the development of agricultural system.

7. Recommendations

Base on the finding of this study, it is recommended that Mathematics should be integrated into Agricultural science curriculum in secondary schools, government should ensure adequate supply of teaching aids that will enable teachers develop measurement and conversion skills in the learners, conducive teaching environment should be provided in schools; government should employ more teachers to cater the large number of students in most secondary schools and most importantly, Mathematics teachers should develop positive attitude towards teaching.

8. References

- i. Abakpa, B O and Agbo-Egwu, A.O (2014) Teaching Mathematics for the development of entrepreneurship. Implications for national development in Abia State, Nigeria.
- ii. Ekwueme, C.O (2013). Mathematics teaching and learning in schools. Calabar, Buchudo science company ltd.
- iii. Free dictionary (2015) <http://www.thefreedictionary.com>.
- iv. Ogunkunle R. A.(2014) Making the teaching and learning of Mathematics exciting. Lead paper presented at the maiden workshop of the mathematical association of Nigeria. Rivers chapter
- v. Science daily (2015) Reference Term, retrieved from www.sciencedaily.com/terms/agriculture.htm on 20th June 2015
- vi. Sidhu K.S (2012) The teaching of Mathematics. Sterling publisher's private limited.
- vii. Uwaezuoke F O. (2014) the Effect of Mathematical Applications on Agricultural. https://www.academia.edu/7243255/The_effect_of_mathematical_applications_on_agricultural_development_in_Abia_state_Nigeria . Retrieved from on 11th June 2015
- viii. Wikipedia, the free encyclopedia (2013). Agriculture. Retrieved from <http://www.en.wikipedia.org/wiki/agriculture> on 11th June 2015.