



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(3): 72-77
www.allresearchjournal.com
Received: 04-01-2022
Accepted: 06-02-2022

Nyamwamu Peter Obaga
Department of Agricultural
Education. Kisii University,
P. O. Box 408-40200 Kenya,
Kenya

Elizabeth Abenga
Department of Curriculum and
Instructional Technology,
Masinde Muliro University of
Science and Technology, P. O.
Box Kakamega, Kenya.

Judith Achieng Odhiambo
Department of Agricultural
Education. Kisii University,
P. O. Box 408-40200 Kenya,
Kenya

Corresponding Author:
Nyamwamu Peter Obaga
Department of Agricultural
Education. Kisii University,
P. O. Box 408-40200 Kenya,
Kenya

Content areas teachers of agriculture in public secondary schools in Nyamira county need professional development

Nyamwamu Peter Obaga, Elizabeth Abenga and Judith Achieng Odhiambo

Abstract

Improved teacher professional development will impact positively on teacher competence through improved learner achievement, industrial progress resulting into international linkages. This study sought to find out content areas where teachers of Agriculture in secondary schools in Nyamira County require professional development. An exploratory research design was used in targeting teachers of Agriculture, Principals and Quality Assurance and Standards officers in Nyamira County. The study employed 167 public secondary schools with 210 teachers of Agriculture. Random sampling was utilized to sample 50 public secondary schools for the study. Simple random sampling was employed to obtain instructors of Agriculture and Principals whereas purposive sampling got employed to obtain Quality Assurance and Standards Officers. Questionnaires were administered on a total of 136 teachers of Agriculture while an interview schedule was administered on 50 Principals and 5 Quality Assurance and Standards officers for collection of primary data. Data gathered was analyzed by use of descriptive and inferential statistics and presented using frequencies, percentages and tables. The study established that there were professional development needs of teachers of Agriculture such as crop production, livestock management and soil & water conservation. Therefore, stakeholders should identify and address these needs in order to enhance professional development of Teachers of Agriculture in this study area and beyond.

Keywords: Content, curriculum, professional, need, Nyamira

Introduction

The Kenya secondary schools Agriculture curricula is developed by a panel which constitutes of the Agriculture subject expert at the Kenya Institute of Curriculum Development (KICD), Agriculture expert from the Kenya National Examinations Council (KNEC), the Quality assurance and standards officer as the head of Agriculture in the Ministry of Education and sampled experts from other learning institutions^[6].

The secondary school Agriculture broadly constitutes these major content areas; Environmental aspects that affect agricultural activities, edaphic and water conservation, water provision, irrigation and drainage, soil nutrition, agricultural tools and equipment, crop and animal husbandry, agroforestry, agricultural structures, farm power and machinery and agricultural economics^[2]. Amongst the goals of agriculture instruction in secondary schools, Agriculture curriculum for^[2] new edition comprises of; arousal and maintaining learner curiosity to obtain basic know-how, actual abilities in agriculture, enables learners to be ready for subsequent studies besides livelihood in Agriculture.

Training teachers of Agriculture on the respective content areas seeks to enhance the professional capability, occupational skills, proficiencies and perceptions of undertaking agricultural science instructors^[8, 9]. It is regarded as a fundamental aspect of national advancement techniques in most societies as a result of the influence of human capital development, efficiency and economic prosperity^[5]. Since the present pre-service instructor instructional programmes by their nature fail to provide the agricultural science instructors with what is expected in order to work efficiently in the classroom set up, and thus, the in-service training is centered on content areas will help to boost individualized logical and professional prosperity of agricultural science instructors^[7].

Materials and Methods

Description of the study area

The study was undertaken in Nyamira County. The county is among the counties that were created out of the former Nyanza Province. This sub county has 167 secondary

schools. The choice of the area under was due to a majority of the secondary schools, there students’ academic performance and enrolment in agriculture subject over the years has remained poor, especially in the Kenya National Examinations.

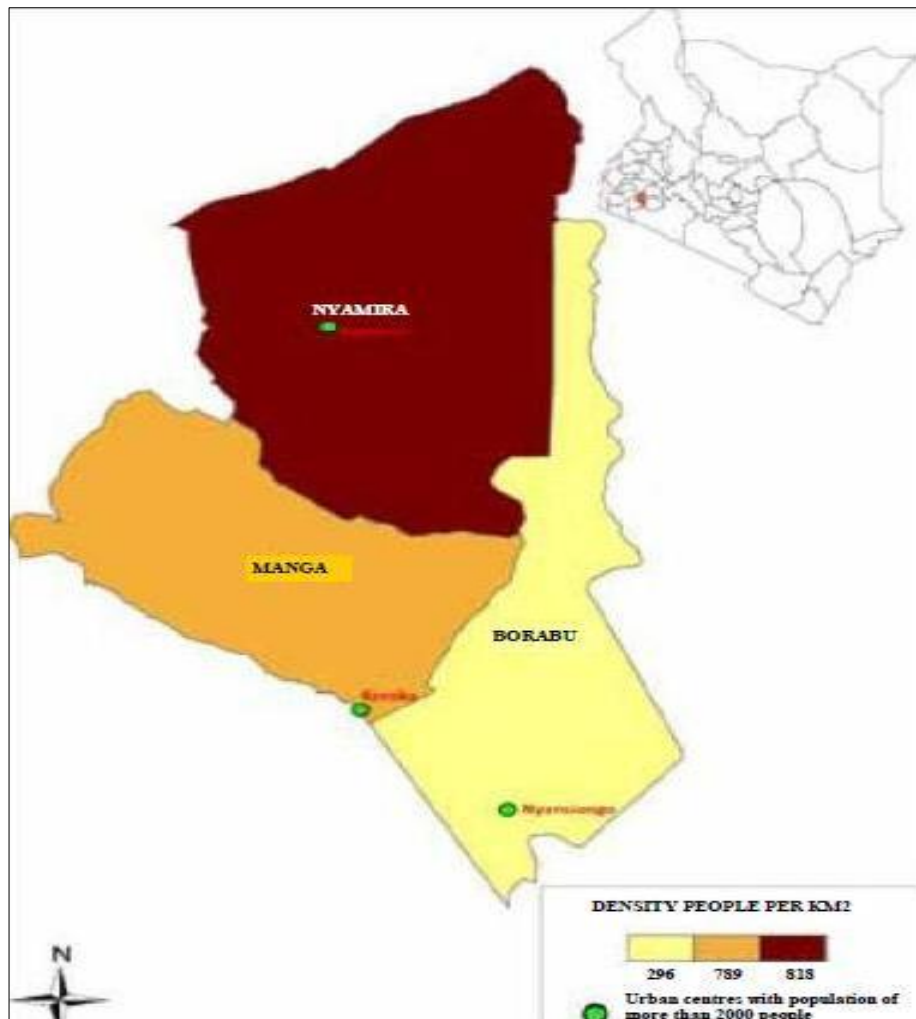


Fig 1: Map of Nyamira County; Adopted from County Commissioner office, Nyamira County.

Sample Size and Sampling Technique

Sample Size

The sample of the respondents for the study was computed using a formula for approximating the sample size from a given population as recommended by [1] and thus;

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1)} + \frac{X^2 P (1-P)}{d^2}$$

S = required Sample Size

N = the population size as provided

P = Population percentage that for this study will be taken to be 0.50; this is the extent that generates the optimum sample size needed.

d = the degree of precision as shown by the amount of error that can be endured in the variation of a sample percentage p concerning the proportion P-the value of d being 0.05 in the computations for entries in the table ,a quantity equal to plus or minus 1.96σ.p

X² =table value of chi square for one degree of freedom relative to the desired level of confidence, which is 3.84 for the 0.95 confidence level shown by items in the table.

Based on the formula shown above, the recommended sample of teachers of Agriculture based on the population size was determined as shown below;

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1)} + \frac{X^2 P (1-P)}{d^2}$$

$$S = \frac{3.84 \times 210 (0.5)^2}{(0.05)^2 (209)} + \frac{3.84 (0.5)^2}{(0.05)^2}$$

$$S = 201.6 \div 1.4825$$

$$S = 135.98$$

$$S = 136$$

The sample size was determined from the infinite population of two hundred and ten teachers of Agriculture (210) as shown so that there was a 95% level of confidence. The sample proportion P was within plus or minus 0.05 of the population value of 0.05 for P for which a minimum of hundred cases are acceptable for research. The sampling units was the teachers of Agriculture in Nyamira County. A total of 136 teachers of Agriculture was used as the sample size which is statistically justified because, according to [1], a minimum of 100 respondents should be used during a survey research. A total of 136 teachers of Agriculture, fifty (50) Principals and five (5) Quality Assurance and Standards Officers made the sample size for the study.

Sampling Procedure

Fifty schools constituting 30% of the 167 schools in Nyamira County were randomly sampled. According to [4], at least 10% of the target population is adequate, for social

science research. From the sampled schools, simple random sampling was done to choose utmost three teachers of Agriculture per school in order to obtain a total of 136 teachers of Agriculture who participated in the study. Fifty Principals from the investigational schools were involved in this investigational study while purposeful sampling was used to obtain the 5 Quality Assurance and Standards Officers.

Data Collection Procedures

Prior to data collection, the researcher acquired a research permit from Ministry of Education through Graduate school, Kisii University. In data collection, the researcher visited the sampled schools, and the heads of the various schools introduced the teachers of Agriculture. The researcher then administered the questionnaires to teachers of Agriculture in the sampled schools. The interview was also be administered on the Principals and the Quality Assurance and Standards Officers for collection of primary data. Questionnaires and the interviews were administered when schools were in session and therefore the instructors of Agriculture, Principals besides the Quality Assurance and Standards Officers were available for this study.

Data Analysis

The questionnaires were counted and values tabulated while utilizing a Five point Likert scale of strongly agree, agree, disagree, strongly disagree and not sure and the responses of strongly agree and agree were amalgamated while strongly disagree and disagree also combined. The data gathered was coded and then analyzed by use of a statistical package for social sciences (SPSS Version 22) and presented using simple percentages, frequencies and tables.

Results

Questionnaire Response Rate

The study had a target of 191 respondents which constituted 136 instructors of Agriculture, 50 Principals and 5 QASOs. The study got a response of 120 instructors of Agriculture which was 88.2 percent response rate, 50 Principals which was 100 percent response rate and 5 QASOs who had a 100 percent response rate. According to [4], 50 percent response rate is sufficient for scrutiny and reporting; 60 percent response rate is good and 70 percent response rate and higher is outstanding and thus the response rate in this investigational study was adequate for analysis and also reporting.

Demographic Information of the Respondents

The study sought to establish the demographic characteristics of the respondents which focused on age, gender, teachers', principals' and education officers' academic attainment and their working experience. These data was analyzed and presented in tabular and graphical forms.

Gender of the Respondents

This study aimed at determining the study participants' gender and their responses were documented. Seventy three point three percent (73.3%) of the teachers of Agriculture were males while 26.7 percent were females. More than half, 58 percent of the Principals were male while 42.0 percent were females. Sixty percent (60%) Quality Assurance and Standards officers were males while 40 percent were females. This implies that majority of teachers of Agriculture, Principals, Quality Assurance and Standards officers were males than females in the sampled schools (Table 1).

Table 1: Gender of Respondents

Gender	Teachers of Agriculture		Principals		Quality Assurance and Standards officers	
	Freq.	Percentage (%)	Freq.	Percentage (%)	Freq.	Percentage (%)
Male	88	73.3	29	58	3	60
Female	32	26.7	21	42	2	40
Totals	120	100	50	100	5	100

Age of the Respondents

Majority of the teachers of Agriculture, 57.5 percent were of age between 31-40 years and followed by 18.3 percent who were aged between 26-30 years. Fifteen point eight percent (15.8%) of the teachers of Agriculture were of age between 41-50 years old while 8.3 percent were above 51 years old. Sixty six percent (66.0%) of the Principals were above 50 years old while 34 percent were of age between 41-50 years

old. Majority, 60 percent of the Quality, Standards and Assurance Officers were of age between 41-50 years while 40 percent were between 46-50 years old. This is an indication that a large population of the respondents were mature enough which enabled them to carry out tasks and proved to be have a physical vigor as compared with the much older ones in the instructional process as demonstrated in Table 2.

Table 2: Age of the Respondents

Age (years)	Teachers of Agriculture		Principals		Quality Assurance and Standards officers	
	Freq.	Percentage (%)	Freq.	Percentage (%)	Freq.	Percentage (%)
<25	-	-	-	-	-	-
26-30	22	18.3	-	-	-	-
31-40	69	57.5	-	-	-	-
41-50	19	15.8	17	34	3	60
Above 51	10	8.3	33	66	2	40
Totals	120	100	50	100	5	100

Academic Qualification of the Respondents

Majority, 53.3 percent of the teachers of Agriculture had Bachelor's degree as their academic qualification, 31.7

percent with Diploma, 13.3 percent with Masters and only 6 (5.0%) had PhD academic qualification. Fifty six percent (56.0%) of the Principals had Bachelor's degree, 16.0

percent had Master’s degree, 8.0 percent had PhD while 20 percent had Diploma as their academic qualifications. Sixty percent (60%) of the Quality Assurance and Standard officers had Master’s degree while 40 percent had PhD academic qualification as illustrated in Table 3. This is an indication that a large population of the instructors of

Agriculture and those tasked with the management of the learning institutions possessed a minimum threshold required in the instructional process and management of the sampled learning institutions. The academic attainment corresponds with the motivation and professional development of instructors of Agriculture.

Table 3: Academic Qualification of the Respondents

Academic Qualification	Teachers of Agriculture		Principals		Quality Assurance and Standards officers	
	Freq.	Percentage (%)	Freq.	Percentage (%)	Freq.	Percentage (%)
Diploma	38	31.7	10	20	-	-
Bachelor’s Degree	64	53.3	28	56	-	-
Master’s Degree	16	13.3	8	16	3	6.0
PhD	6	5.0	4		2	4.0
Totals	120	100	50	100	5	100

Working Experience of the Respondents

Forty percent (40.0%) of teachers of Agriculture had a teaching experience between 5-7 years followed by twenty eight percent (28.3%) of the teachers of Agriculture had an instructional experience of 2-4 years while 15.8 percent had less than 1 and above 8 instructional experience respectively. Majority, 44.0% of the Principals had a working experience of between 5-7 years while 28.0 percent, 10.0% and 18.0% had 2-4, less than 1 and above 8 working experience respectively. Eighty (80%) QASOs had working experience of 5-7 years while only 20% had a working experience of above 8 years. This denotes that most

instructors of Agriculture, Principals and QASOs had a working experience of more than one year and thus were capable to provide appropriate feedback to the questionnaires and interview items in relation to the content areas that instructors of Agriculture in public secondary schools in Nyamira County needs. Additionally, these findings denotes that most the instructors of Agriculture, Principals and QASOs were senior personnel with vast experience. These study results demonstrate that the respondents had a potential to provide appropriate responses concerning instructional of Agriculture as presented in Table 4.

Table 4: Working experience of the Respondents

Working experience (yrs.)	Teachers of Agriculture		Principals		Quality Assurance and Standards officers	
	Freq.	Percentage (%)	Freq.	Percentage (%)	Freq.	Percentage (%)
Less than 1	19	15.8	5	10.0	-	-
2-4	34	28.3	14	28	-	-
5-7	48	40.0	22	44	4	80
Above 8	19	15.8	9	18	1	20
Totals	120	100	50	100	5	100

Responses on Content Areas that teachers of Agriculture needed Professional Development

The study sought to establish responses on content areas that teachers of Agriculture needed professional development. The study participants were requested to show the degree to which they agreed or disagreed with the statements provided.

Teachers’ Views on Content Areas that they needed Professional Development

The study sought to establish content areas that teachers of Agriculture needed professional development. Soil and water as an area that teachers of Agriculture need professional development, 21.7 percent strongly agreed, 29.1 percent agreed, 20.0 percent disagreed while 29.2 percent of them strongly disagreed with the statement (Table 5).

Table 5: Teachers of Agriculture’s responses on Content areas that teachers of Agriculture needed Professional Development

Content Areas	Strongly Agree		Agree		Disagree		Strongly Disagree		Not Sure		Totals	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
Agricultural engineering	43	35.8	67	55.9	-	-	-	-	10	8.3	120	100
Agricultural economics	51	42.5	60	50.0	-	-	-	-	9	7.5	120	100
Animal nutrition	41	34.2	46	38.3	12	10.0	-	17.5	-	-	120	100
Animal diseases	70	58.3	50	41.7	-	-	-	-	-	-	120	100
Crop diseases	62	51.7	54	45.0	-	-	-	-	4	3.3	120	100
Soil and water	26	21.7	35	29.2	24	20.0	35	29.1	-	-	120	100

There was statistical significance ($p < 0.05$) on teachers of Agriculture’s responses on content areas that teachers of

Agriculture need professional development (Table 6).

Table 6: Statistical analysis on teachers of Agriculture's responses on content areas that teachers of Agriculture needed professional development

Statements	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	50.000	17	2.941	3.529	.016
Within Groups	10.000	12	.833		
Total	60.000	29			

Principals' Views on the Professional Development Content Areas Needed

The study sought to find out content areas that teachers of Agriculture needed professional development. Forty six percent (46.0%) of the Principals strongly agreed that agricultural engineering was a content area that teachers of

Agriculture needed professional development, 38.0 percent agreed while only 16 percent were not sure to with the same statement. This imply that there were content areas that instructors of Agriculture needed professional development (Table 7).

Table 7: Principals' responses on Content areas that teachers of Agriculture needed Professional Development

Content Areas	Strongly Agree		Agree		Disagree		Strongly Disagree		Not Sure		Totals	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
Agricultural engineering	23	46.0	19	38.0	-	-	-	-	8	16	50	100
Agricultural economics	24	48.0	17	34.0	2	4.0	5	10.0	2	4.0	50	100
Animal nutrition	20	40.0	19	38.0	6	12.0	4	8.0	1	2.0	50	100
Animal diseases	27	54.0	20	40.0	-	-	-	-	3	6.0	50	100
Crop diseases	30	60.0	20	40.0	-	-	-	-	-	-	50	100
Soil and water	24	48.0	18	36.0	-	-	-	-	8	16.0	50	100

There was statistical significance ($p < 0.05$) on Principals' responses on content areas that teachers of Agriculture need

professional development (Table 8).

Table 8: Statistical analysis on principals' responses on content areas that teachers of Agriculture needed professional development

Statements	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	53.333	15	3.556	7.467	.001
Within Groups	6.667	14	.476		
Total	60.000	29			

Quality Assurance and Standards officers' Views on Needed Professional Development Content Areas

Majority, 60.0 percent of the Quality Assurance and Standards officers strongly agreed that agricultural engineering was a content area that teachers of Agriculture needed professional development while 40.0 percent also agreed with the same statement. Soil and water as a content area that teachers of Agriculture needed professional

development, majority, 60.0 percent of the Quality Assurance and Standards officers agreed while 40.0 percent of them strongly agreed with the statement as illustrated in Table 9. Therefore, this implies that there were content areas that teachers of Agriculture needed professional development which needs to be looked into by relevant stakeholders.

Table 9: Quality Assurance and Standards officers' responses on Content areas that teachers of Agriculture need Professional Development

Content Areas	Strongly Agree		Agree		Disagree		Strongly Disagree		Not Sure		Totals	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
Agricultural engineering	3	60.0	2	40.0	-	-	-	-	-	-	5	100
Agricultural economics	2	40.0	2	40.0	-	-	-	-	1	20.0	5	100
Animal nutrition	2	40.0	1	20.0	-	-	-	-	2	40.0	5	100
Animal diseases	5	100	-	-	-	-	-	-	-	-	5	100
Crop diseases	5	100	-	-	-	-	-	-	-	-	5	100
Soil and water	2	40.0	3	60.0	-	-	-	-	-	-	5	100

There was statistical significance ($p < 0.05$) on Quality Assurance and Standards officers' responses on content

areas that teachers of Agriculture need professional development as shown in Table 10.

Table 10: Statistical analysis on Quality Assurance and Standards officers' responses on content areas that teachers of Agriculture need professional development

Statements	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	27.000	4	6.750	5.114	.004
Within Groups	33.000	25	1.320		
Total	60.000	29			

Discussion, Conclusion and Recommendations

Content Areas that Needed Professional Development by Teachers of Agriculture in Public Secondary Schools in Nyamira County

Agriculture education involves content areas such as crop and animal husbandry, edaphic and water conservation and other different aspects of agriculture. In addition, Agricultural teacher education comprises of instruction in food production which aims at improving livelihood for the entire population by assisting farmers boost production, utilize resources well and generate nutritious foods. Results from this study indicates that agricultural engineering, agricultural economics, animal nutrition, animal diseases, crop diseases and soil & water. Some of the content areas that teachers of Agriculture in secondary schools in Nyamira County required professional development. Acquisition of knowledge and skills on various content areas expands the instructor's skills on primary tenets and undertakings in agriculture. Additionally, it is meant to enhance instructors' comprehension of the worth of agricultural production to households and community in general with an aim to develop self-reliance, resourcefulness, problem solving abilities and an occupation outlook in agriculture. These findings imply that there were content areas that teachers of Agriculture needed professional development which needed to be addressed by the stakeholders in order to enhance teachers' of Agriculture's professional development.

In support of these findings, [3] observed that a variety of content areas cutting across crop and animal husbandry form significant content areas that teachers of Agriculture for professional development. Additionally [10], are in line with these study findings, that teachers possess diverse content areas that need to be looked into for professional development. The scholars further emphasized that in order point out appropriate activities required in teachers' professional development, investigators ought to make comparisons concerning variability in the programme content against variability in these expected output.

Conclusion

There were content areas that teachers of Agriculture needed professional development.

Recommendations

There should be regular identification of relevant content areas needed in professional development of teachers of Agriculture in order to have them addressed appropriately.

Conflict of Interest

"The author(s) declare(s) that there is no conflict of interest." There was no role of the funding sponsors in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Acknowledgement

The author appreciates the input, support and guidance accorded by the study supervisors, the department of Agricultural Education, Kisii University, all the teachers of Agriculture and Principals of the sampled schools and Quality Assurance and Standard Officers of Nyamira County.

References

1. Kathuri NJ, Pals DA. Introduction to educational research, Egerton University, Njoro: Education Materials Centre, 1993.
2. Kenya Institute of Curriculum Development. "Revised and Approved Secondary, School, Curriculum". Kenya Institute of Curriculum Development, 2014.
3. Meissel K, Parr J, Timperley H. Can professional development of teachers reduce disparity in student achievement? *Teaching and Teacher Education*. 2016;58:163-173.
4. Mugenda OM, Mugenda AG. *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press, 1999.
5. Ndem JU. Mechanisms for Enhancing Teacher's Effectiveness in the Implementation of Agricultural Science Programme in Secondary Schools in Afikpo Education Zone of Ebonyi State. *Journal of Education and practice*. 2016;7(4):6-16.
6. Ngesa FU. Demand Profiles and Supply Responses for Agricultural Education and Training (AET) at the Post-Primary Education Level: Case Study of Kenya Final Report. Unpublished report prepared for the World Agroforestry Centre (ICRAF), Nairobi, Kenya, 2016.
7. Odumosu AI, Keshinro O. *Effective Science Teaching and Improvisation in the classroom*. Lagos: Ogbinaka and Obaro Publishers Ltd, 2012.
8. Okojie MU. Teacher Education: Challenges for the 21st Century. *Multidisciplinary Journal of research development*. 2009;13(1):93-100.
9. Ochu AO. Agricultural Education as Panacea to food crisps and Poverty Eradication in Nigeria: Implications to Teacher Preparation Zaria, Nigeria: Faculty of Education Seminar Series, 2010, No. 2.
10. Sedova K, Sedlacek M, Svaricek R. Teacher professional development as a means of transforming student classroom talk. *Teaching and Teacher Education*. 2016;57:14-25.