



CORRELATION OF AGRICULTURAL SCIENCE TEACHERS' QUALIFICATION AND THEIR COGNITION

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ABSTRACT

The study correlates agricultural science teacher's qualification and their levels of cognition. Two objectives, two research questions and one hypothesis were formulated to guide the study. The study adopted descriptive-correlational survey research designs. The population was all the 168 graduates' teachers teaching agricultural science in the public secondary schools of Bauchi state, Nigeria. A stratified random sampling technique was used to select 120 teachers. Florida taxonomy of cognitive behaviour was used as instrument for data collection and was pilot tested using thirty (30) Agricultural science teachers outside the study area and obtained a reliability coefficient of 0.98. The instrument was administered to the selected respondent for data collection. The data collected were analysed using descriptive statistics and Pearson product moment correlation. The results revealed that agricultural science teachers with bachelor degree exhibit higher level of cognition than teachers with master's degree at both lower and higher cognitive levels with both teachers teaching at lower cognitive level. There was no significant relationship between secondary school agricultural science teacher's qualification and their level of cognition. It was recommended that Agricultural science teachers should be sent for in service training to upgrade on the six levels of cognitions (knowledge and comprehension, application, analysis, synthesis, and evaluation).

Keywords: Agricultural science, Higher level of cognition, Lower level of cognition, Teachers' qualification.

INTRODUCTION

Agricultural science teachers' teaching qualification is one of the major quality of the teachers, this means that the qualification of an agricultural science teacher play important roles when it comes to effective teaching and learning. Adediwura (2007) opined that Certificate status of the agricultural science teachers is a measure of teacher qualifications that deals with the knowledge about subject matter which include the use of both lower levels of cognition (knowledge, comprehension) and higher levels of cognition (application, analysis, synthesis, and evaluation) in the teaching and learning process. The meaning of the certificates varies because of the differences in its class, but a standard certificate generally means that a teacher has been prepared in an approved teacher education programme at the undergraduate or postgraduate levels and has completed agricultural education training either in the field of crop, animal, extension or economics. In Nigeria, the minimum requirement for teaching is National Certificate in Education (NCE.) as stipulated by the Federal Government of Nigeria (FGN, 2004). David (2012) asserted that students, who are curious stakeholders in educational enterprise, have long suspected and speculated that some of their teachers lack the necessary professional qualification (that is, skills, techniques, strategies, temperament et cetera) required to communicate concepts, ideas and principles in a way that would facilitate effective teaching and learning.



Developing qualitative agricultural science teachers for public senior secondary schools has been and continues to be the goal of teacher education programmes in the faculties of education of the Nigerian universities and colleges of education across the nation. The issue of agricultural science teacher quality of qualification in relationship to teaching using six levels of cognition (knowledge, comprehension, application, analysis, synthesis, and evaluation) is not a new phenomenon in the teaching and learning process. From the early beginnings of formalized teacher education, there have been issues dealing with the qualifications and development of qualified individuals to teach in the public senior secondary schools.

World-wide education is generally being considered as instrument per excellence for affecting national development and the teacher resource on which the whole educational enterprise depends. As the Nigerian society is evolving, the need for qualified teachers is ever increasing. Therefore, there is growing pressure on the teacher education programmes to provide the required number of teachers and with updated qualifications (Maikano, 2012).

There has been a call by state and federal governments as well as all stakeholders in the educational sector to teachers to teach their students both at lower cognitive levels (knowledge and comprehension) as well as higher cognitive levels (application, analysis, synthesis, and evaluation). Ulmer (2005) assessed the cognitive level of Agricultural science teachers in secondary schools teaching agricultural science and found that agricultural science teachers were mainly teaching at the remembering (lower) level of cognition (knowledge and comprehension) despite their higher level qualifications of degree. Umar (2015) found that Agricultural science teachers sought to teach at all levels of cognition, but much of the teaching was at lower levels of cognition and further examined the thinking opportunities provided by Agricultural science teachers through cognitive level and found 80% of their cognition were found to be at the knowledge and comprehension levels of cognition despite their teaching qualification. It was in line with these that the study was carried out to provide answers to the following research questions:

1. What are the demographic characteristics of the agricultural science teachers in senior secondary schools of Bauchi State?
2. To what extent does qualification of Agricultural science teachers relate with their level of cognition?

The main purpose of this study was to correlate the qualifications of agricultural science teachers and their level of cognition in Bauchi State. The study intends to:

1. Determine the demographic characteristics of the agricultural science teachers in senior secondary schools of Bauchi State.
2. Correlate the qualification of agricultural science teachers with their levels of cognition.

The hypothesis of the study was; H_{01} : There is no significant relationship between Agricultural science teachers' qualification and their level of cognition in Bauchi State senior secondary schools.

MATERIALS AND METHODS

The design of the study was a descriptive-correlational survey designs and the area of the study was Bauchi state with a population of 168 graduates' teachers teaching agricultural science in the public senior secondary schools. A stratified random sampling technique was used to select 120 teachers. Florida Taxonomy of Cognitive Behaviour (FTCB) was used as instrument of data collection; it was adapted from Ulmer (2005) to measure the levels of cognition of agricultural science teachers that provide a framework for observing and recording the cognitive level of teachers. The instrument was made up of two sections (A and B). Section A seeks information on demographic characteristics of the teachers while, section B is a 55



observation questions on seven levels of cognitions. The seven levels of Florida Taxonomy of Cognitive Behaviour (FTCB) were identified and observers are to select the appropriate column in a scale of 1 – 10 options, where 1 is the lowest value and 10 is the highest value on the scale. Instrument was then pilot tested using thirty (30) Agricultural science teachers outside the study area in some selected senior secondary schools of Gombe State and a reliability coefficient of 0.98 was obtained. The instrument was administered to the respondents. The data collected was analysed using descriptive statistics and pearson product moment correlation.

RESULTS AND DISCUSSION

Research Question One

What are the demographic characteristics of the agricultural science teachers Bauchi State?

Table 1 present the demographic characteristics of the agricultural science teachers in Bauchi State with majority (61%) aged 20 -35 years, this shows that the teachers are in their youthful age. From the results, 71.1% were male teachers while 28.3% were female teachers; this indicates that male dominating the teaching of Agricultural Science in Bauchi State senior secondary schools. It was also reported that 70% of the teachers were married while 30% were single. 72.5% of the teachers taught in urban schools while 27.5% were teaching in rural schools. About 68% had bachelor's degree as highest qualification while 82% of the teachers had less than 10 years teaching experience. With 53.3% of them teaching in SSI and having a student's ratio of 2:1 for the male to female. Other none teaching duties performed by the Agricultural Science teachers include 41.7% Class Master, 10% House Master, 11.7% Examination Officer, 12.5% Labour Masters, 10% Games Master. 5.8% Food Master.

The finding of the study revealed that majority of the Agricultural science teachers in senior secondary schools of Bauchi State are male, married, aged between 20-35 years, hold bachelor degree as their highest educational qualifications, teach in urban schools with less than 10 years teaching experienced. This finding was supported by Abdulhamid (2012) who reported that majority of secondary school Agricultural science teachers in Bauchi State are less than 45 years, most of them were male and had HND as their highest qualification and with less than 20 years working experience. The findings were also supported by Kattlyn and Daniel (2008) who reported that Majority of the Agricultural science teachers aged between 22 to 36 years, had less than four years of teaching experience, male teach agricultural science in urban schools and had a B.SC degree as their highest teaching qualification. Ulmer (2005) also reported that, the average agriculture science teachers in his study were male having 34.5 years of age and 9.5 years of teaching experience. In addition, the majority of the agriculture science teachers held a bachelor's degree and was certified to teach only agriculture in their schools. The average years of teaching, degree and certification areas would imply that the sample represented varying levels of experience. The level of experience and education implies that the Agricultural science teachers in the study exhibited common cognitive behaviours.



Table 1: Demographic Characteristics of the Respondents (n = 120)

Variables	Frequency	Percentage
Age (years)		
Less than 20	8	6.7
20-35	74	61.6
36-40	36	30
41-50	2	1.7
Gender		
Male	86	71.1
Female	34	28.3
Marital Status		
Married	84	70
Single	36	30
School Location		
Urban	87	72.5
Rural	33	27.5
Highest Teaching Qualification		
PGDE	33	27.5
Bachelors	81	67.5
Masters	6	5
Teaching Experience (Years)		
Below 5	43	35.8
5-10	56	46.6
11-15	5	12.5
16-20	6	5
Classes being Taught		
SSI	64	53.3
SSII	34	28.4
SSIII	22	18.3
Total	120	100
Average % of Students in Class		
Female	17	34
Male	33	66
Total	50	100
Other None Teaching Duties		
Class Master	50	41.7
House Master	12	10
Exam officer	14	11.7
Labour Master	15	12.5
Games Master	12	10
Food Master	7	5.8
Others specify	10	8.3



Research Question Two

To what extent does qualification of Agricultural science teachers relate with their level of cognition?

From Table 2, the level of cognition shows by senior secondary school’s Agricultural science teachers in Bauchi State at knowledge level was 5.59 for PGDE, 6.41 for bachelor degree, master’s degree 4.03 and 5.34 for PGDE, bachelor degree and master’s degree. This shows that Agricultural science teachers with bachelor degree operate high above PGDE teachers followed master’s degree and both PGDE and bachelor degree operate at high level of cognition for knowledge and master’s degree teachers operate at lower level of cognition.

At comprehension level the cognition show by senior secondary school Agricultural science teachers was 5.32 for PGDE, 6.08 for bachelor degree, 2.70 for master’s degree and 4.70 for both PGDE, bachelor degree and master’s degree.

This shows that teachers with bachelor degree operate high above PGDE at high level of cognition while master’s degree teachers operate at lower cognitive level for comprehension. The level cognition by show Agricultural science teachers at application was 4.43 for PGDE, 4.63 for bachelor degree, 3.55 for master’s degree and 4.20 for both PGDE, bachelor degree and master’s degree. This shows that bachelor degree operates slightly above PGDE followed by master’s degree but all of them teach at lower level of cognition for application.

At Analysis level the cognition shown by senior secondary school Agricultural science teachers was 3.15 for PGDE, bachelor degree was 2.90, master’s degree was 2.15 and 2.70 for PGDE, bachelor degree and master’s degree. This shows that teachers with PGDE operate high above bachelor degree teachers followed by master’s degree but all of them operate at lower level cognition for analysis.

Table 2: Cognitive Behaviour of Agricultural Science Teachers in relation to their Educational Qualification

Cognitive level	PGDE			Bachelor Degree			Master Degree			Both		
	\bar{X}	SD	Var	\bar{X}	SD	Var	\bar{X}	SD	Var	\bar{X}	SD	Var
Knowledge	5.59	0.58	0.33	6.41	0.60	0.35	4.03	1.20	1.50	5.34	0.80	0.73
Comprehension	5.32	0.35	0.12	6.08	0.37	0.14	2.70	0.61	0.37	4.70	0.44	0.21
Application	4.43	1.50	2.30	4.63	0.57	1.30	3.55	0.39	0.20	4.20	0.82	1.30
Analysis	3.15	0.40	0.16	2.90	0.42	0.18	2.15	0.51	0.26	2.70	0.44	0.20
Synthesis	2.58	0.58	0.34	2.73	0.69	0.48	1.89	0.35	0.12	2.40	0.54	0.34
Evaluation	3.58	0.21	0.03	3.75	0.21	0.04	1.55	0.35	1.30	3.05	0.26	0.61

Keys: \bar{X} = Mean; SD = Standard Deviation; Var = Variance

The level of cognition show by Agricultural science teachers at synthesis was 2.58 for PGDE, 2.73 for bachelor degree, 1.89 for master’s degree and 2.4 for both PGDE, bachelor degree and master’s degree. This shows that bachelor degree operates slightly above PGDE



followed by master’s degree and all the teachers operate at lower level of cognition for synthesis. The level cognition shown by Agricultural science teachers at evaluation level was 3.85 for PGDE, 3.75 for bachelor degree, 1.55 for master’s degree and 3.05 for both PGDE, bachelor degree and master’s degree. This shows that PGDE operate slightly above bachelor degree followed by master’s degree, all of them operate at lower level of cognition for evaluation.

The finding also revealed that Agricultural science teachers with bachelor degree exhibit higher cognitive behaviour than teachers with PGDE and Master’s degree at both lower and higher levels of cognition and both of them teach at lower cognitive level (knowledge and comprehension) than at higher cognitive level (application, analysis, synthesis and evaluation). This finding agreed with that of James (2008) who stated that the cognitive behaviour exhibited by agricultural science teachers was reported to be appropriate while it was indicated that Agricultural science teachers with bachelor degree display higher behaviour than M. Phil and Master’s Degree teachers. He further stated that to enter into a senior secondary school teaching a bachelor degree is a minimum requirement. He suggested that qualified Agricultural teacher science is a pre-requisite for advancement of knowledge, promotion of socio-economic development of the country. The availability of such manpower is possible only through institutions of higher learning having well equipped laboratories, properly maintained libraries, favourable environment in scientific knowledge which could provide leadership and guidance. The idea was also supported by UNESCO (2004) who reported that the quality of Agricultural science teachers is a multi-dimensional concept, which should embrace all its functions and activities, teaching and academic programmes, research and scholarship, staffing, students, buildings, facilities, equipment, services to the community and academic environment.

Table 3 showed that there was a low positive correlation between qualification of Agricultural science teachers and their level of cognitive behaviour at lower cognitive level. The table shows that the calculated value of r was .018 is greater than p < 0.05 level of significant set for the study. Also the cognition (1.7727) showed high mean than qualification with a mean score of (4.4900) meaning that cognition and qualification move in the same direction from each other, that is as qualification goes up, the cognition goes up.

Table 3: Pearson Product Moment Correlation Coefficient of Agricultural Science Teachers’ Qualifications and their Levels of Cognition at Lower Cognitive level

Variables	N	Mean	SD	R	P-value	Decision
Cognition	120	0.018	0.05	1.77271	.50143	Significant
Qualification	120	4.4900.50063				

Keys: N = Number of respondents; SD = Standard Deviation; r = Relationship

Table 4 showed that there was a low positive correlation between qualification of Agricultural science teachers and their level of cognitive behaviour at high cognitive level. The table shows that the calculated value of r was .016 which is less than p < 0.05 level of significant set for the study. Also the cognition showed high mean score (1.7727) than the qualification with a mean score (2.3345) meaning that cognition and qualification move in the same direction from each other that is as qualification goes up, the cognition goes up. This shows that there was a low negative correlation between qualification of Agricultural science teachers and their level of cognitive behaviour at both lower and high levels of cognition. The finding also stated that there was a significant negative relationship between secondary school agricultural science teacher’s qualification and their level of cognitive behaviour at both lower and higher cognitive



level. The findings was supported by that of Ulmer (2005) who reported that cognitive behaviour exhibited by Agricultural science teachers and level of educational qualification had a low negative relationship at both lower and higher cognitive levels, also in the same study a low negative relationship between years of experience of Agricultural science teachers and their attitude toward teaching at higher cognitive levels exist and negligible negative relationship between Agricultural science teachers years of teaching experience and total teacher cognitive behaviour. The relationship between attitude of Agricultural science teachers toward teaching at higher levels of cognition and teachers' total cognitive behaviour was found to be substantial. Ulmer (2005) further stated that Agricultural science teachers' qualification (highest degree) will not predict Agricultural science teachers' level of cognitive behaviour.

Table 4: Pearson Product Moment Correlation Coefficient of Agricultural Science Teachers' Qualification and their Levels of Cognition at Higher Cognitive level

Variables	N	Mean	SD	r	P-value	Decision
Cognition	120	1.7727	.78850	.016	0.05	Significant
Qualification	120	2.3345	.50063			

Keys: N = Number of respondents; SD = Standard Deviation; r = Relationship

CONCLUSION AND RECOMMENDATIONS

Agricultural Science teachers in Bauchi State operate at lower level of cognition and also teach their students at lower cognitive level (knowledge and comprehension). Qualification have an inverse relationship with cognitive behaviour, therefore, increase in Agricultural Science teacher's qualification will determine increase in teacher's cognitive behaviour. From the findings, the following conclusions are made:

1. Majority of the Agricultural science teachers in senior secondary schools of Bauchi State are male, married, aged between 20-35 years, hold bachelor degree as their highest educational qualifications, teach in urban schools with less than 10 years teaching experience.
2. Agricultural science teachers with bachelor degree exhibit higher cognitive behaviour than teachers with PGDE and Master's degree at both lower and higher levels of cognition and both of them teach at lower cognitive level (knowledge and comprehension) than at higher cognitive level (application, analysis, synthesis and evaluation).
3. There was a significant negative relationship between secondary school agricultural science teacher's qualification and their levels of cognition at both higher and lower cognitive level.

The following recommendations were made:

1. The higher institutions responsible for training Agricultural Education teachers should intensify effort at producing teachers that will be able to teach Agricultural science at both lower and higher levels of cognition at senior secondary school levels.
2. Agricultural science teachers should be sending for in service training to upgrade on the six levels of cognitions (knowledge and comprehension, application, analysis, synthesis, and evaluation).
3. Government and all stakeholders in the education sector should not put emphasis on employing teachers with higher degree (maximum bachelor degree) to teach senior secondary school Agricultural science.
4. School administrators should ensure that Agricultural science student examination cover both lower and higher levels of cognition.



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