

HEAD TEACHERS' ROLE IN MANAGING SCIENCE EDUCATION TOWARDS SUSTAINABLE DEVELOPMENT IN NORTH- CENTRAL ZONE, NIGERIA

* **Abdullahi, NimotaJibolaKadir**

Department of Educational Management,
University of Ilorin, Ilorin, Nigeria
* *abdullahi.njk@unilorin.edu.ng*

Jimoh, AbiodunAkanbiGafar

Department of Health Promotion and Occupational Health
University of Ilorin, Ilorin, Nigeria

ABSTRACT

This study investigated head teachers role in managing science education toward sustainable development in north-central zone, Nigeria. Specifically, the purpose of this study was to find out the relationship between head teachers' ways of motivating science teachers, method of supervision and sustainable development in North-Central Zone, Nigeria. To achieve this, two hypotheses were formulated and tested. Quantitative research design was used for the study. A self-designed questionnaire titled "Head Teachers Managing Science Education and Sustainable Development Questionnaire" (HTMSESDQ) was used to collect information for the study. A purposive sampling technique was used to select four science teachers as the participants from the sample schools which made up of 1,324 participants from 331 selected public junior secondary schools out of 2,335 schools in north-central zone. Two hypotheses were formulated and tested. Proportional sampling technique was used to select 331 public junior secondary schools. Two research questions were raised to guide the study and answered. Pearson product moment correlation statistic was used to test the hypotheses at 0.5 level of significance. The findings of this study revealed that there was a significant relationship between head teachers' ways of motivating science teachers with $r(1324) = 0.92, p < 0.05$, methods of supervision and sustainable development with $r(1324) = 0.91, p < 0.05$. It was, therefore, recommended that head teachers should continue to motivate their science teachers by encouraging them to go for in-service training to update their knowledge and skill, gives written commendation to hardworking teachers, as well as helping them morally and financially in terms of need among others. Furthermore, Head teachers should continue to use appropriate methods of supervision by act as a guide during supervision, initiate current practices and method of teaching as well as respect the view and opinion of teachers among others for the achievement of sustainable development in public junior secondary schools in North- Central geo-political zone.

Keywords: *headteacher, managing science education, sustainable development, North Central Nigeria*

INTRODUCTION

The role of science as a source of sustainable development and solutions has been widely recognized. Science education seeks to develop the minds and character abilities, skills and potentials of future citizens in order to equip them for contemporary society. Additionally, science education have to be properly and effectively managed, controlled and supervised towards achieving sustainable development.

Science education is very crucial to the development of any nation that is why every nation must take it very serious in all institutions of learning towards sustainable development. Many of the developed countries achieved so much in science and technology because of science education. Without science, there can be little progress towards sustainable development. Science is a powerful driver of any country for the attainment of progress and success in area of industrial, economic and social development. It also has shaped the world in terms of technology and innovation. Science education in junior secondary school such as basic science, basic technology, agricultural science, cultural and creative art and the likes is critical to future employability of many young people and create scientifically literate citizens towards sustainable development.

REVIEW OF RELATED LITERATURE

The role of head teacher in managing science education towards a sustainable development cannot be overemphasized. The head teacher as a leader has the function of motivating teachers in order to improve teaching and learning situation for the student through instructional supervision. Motivation and supervision are part of processes by which head teachers attempt to achieve acceptable standards performance towards sustainable development. According to Kadir and Manga (2015), motivation is part of managerial behavior to arouse teachers' enthusiasms in performing their job efficiently and effectively towards sustainable development.

The function of the head teacher as a supervisor includes visiting classroom often to observe his teachers teaching, supervision of teachers lesson note, offering them professional advice for their proper improvement of teaching and learning as well as initiate current practice in science towards sustainable development. Daresh (2007) views that the importance of supervision is that its requires head teacher not to see supervision as a series of task but view it as a sustainable model of cultivating the habit of improving educational sector and effectively establish more progressive interactions which will yield good ideas for the improvement of science education in order to achieve sustainable development.

Motivation can be refers to the drive force within human organism that move or make him want to channels his behaviour towards the achievement of an organizational goal. This involves encouraging and inspiring people to take the required action (Durosaro, 2012). Head teacher needs to know how to motivate his teachers for the achievement of educational goals. In a school system, the head teacher need to get results through people or get the best out of people by encouraging them to go for in-service training to update their knowledge and skill, gives written commendation to hardworking teachers, help teachers morally and materially, assist teachers to get promotion as at when due as well as gives adequate authority to teachers in execute their duties.

Supervision can be seen as legitimate effort made by assigned professionals to assist the teachers on how to improve their competence to become self-propelling practitioner in order to ensure favourable setting for effective teaching and learning (Ijaiya, 1991). Head teacher also need to supervise the work being done by teachers and ensuring that activities are carried out in line with agreed standards and taking steps to correct problems by act as guide during supervision, provide constructive criticism diplomatically during supervision, initiate current practices and methods of teaching, respect the view and opinion of teachers as well as uses the method of supervision which is democratic in nature.

Science Education

Science education is concerned with sharing process of teaching science in order to provide expected development and understanding part of scientific community. The science education subjects in secondary schools include basic science, basic technology, agricultural science, cultural and art creativity, physics, chemistry and biology. Onah (2003) defined science education as the bedrock upon which any nation can be build towards development. Sustainable development can be seen as stability of economic, environment and social concerns through decision making (Stoddart, 2011).

Therefore, science education can be used to attain stable and acceptable economic, social and environment in the country. Sustainable development in this study implies a way of meeting the needs of present science students and enhancing opportunities for the future. It is expecting of head teachers as a manager to manage all resources in such a way that economic, social and environment needs can be fulfilled while maintaining cultural integrity, biological diversity and life support systems for the usefulness of society.

Sustainable Development

Sustainable development is a process of improving the opportunities that will make people achieve their full aspirations and potential over a period of time while maintaining stable and balance of economic, social and environment (Omole & Ozoji, 2014). Sustainable development focused on a large number of interrelated global challenges such as poverty, unemployment, hunger and the like. Therefore, the way to promote the society's development is science education for sustainable development which involves developing certain skills in science teachers through personal change, cooperation, research and exchange of ideas.

The theoretical framework of this study centered on the Social System Theory postulated by Parson (1977). According to the author, a system is a set of interrelated parts that function as a whole to achieve common purpose. A system functions by acquiring input from the external environment, transforming them in order to discharging output back to the environment. Students are admitted into junior secondary schools from the society and transformed as output back to the society. Simply put, the school as a system has various inputs that are processed to produce output with feedback to the environment/society as represented in figure 1.

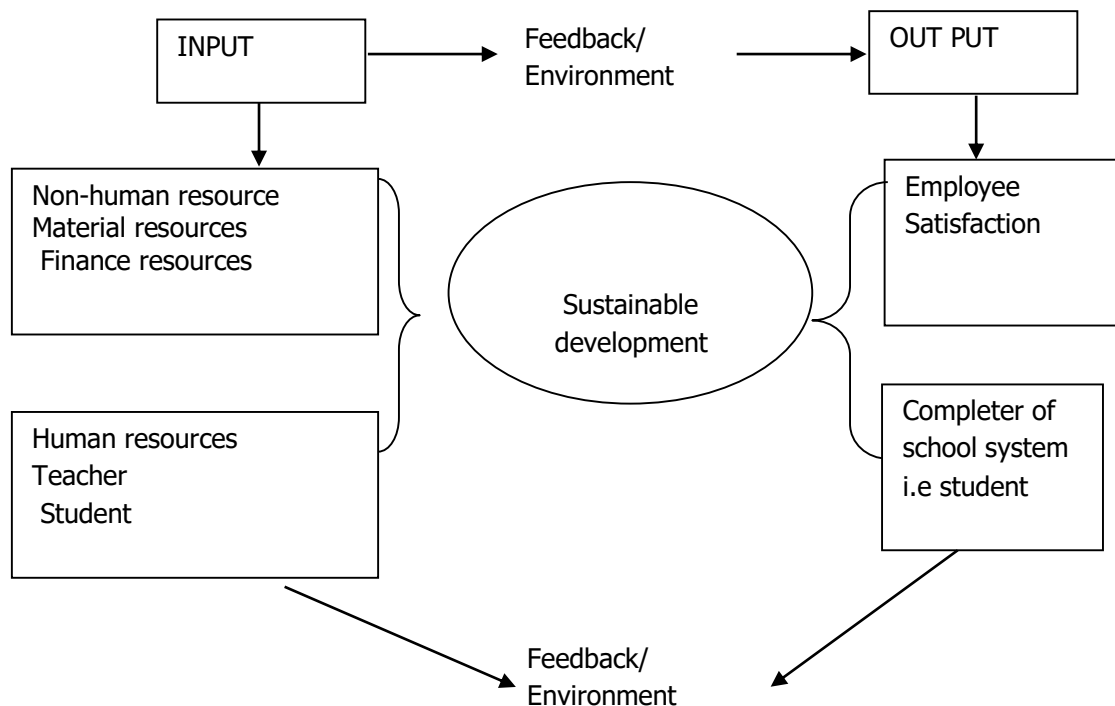


Figure 1: The General System Model Source: Adapted from Parson (1977, p.35)

The theory is applicable to this study in that School inputs are human and non-human resources used to produce goods and services. In junior secondary school system, the non-human resources include infrastructure facilities provided by schools for teaching and learning process under the supervision of head teachers. Human resources are teaching and non-teaching staff and students that will make use of non-human resources towards the achievement of sustainable national development. The transformation process is the management of available resources in order to change the inputs to outputs. Based on this study the output elements include student academic performance in science education, the feedback is the knowledge acquired by students in science education, and the environment includes the social, political and economic forces that will engage the output from junior secondary school. Application of system theory in education will assist junior secondary school head teacher in managing science education to produce good product that will be useful to the society for the achievement of sustainable development in Nigeria.

Okoli, Obiajulu and Ella (2013) investigated challenges and prospects of science education for sustainable development in Nigeria. The study recommended that government should provide necessary science research equipment so that Nigeria scientists can carry out research work without tears also science teachers should be well paid so that they can improve their performance. This study was quite similar to the current study as it looked at science education for sustainable development. However the study left a lot of gap in that it did not examine head teachers' role in terms of motivation and supervision of teacher for effective management of science education toward the realization of sustainable development.

STATEMENT OF THE PROBLEM

Several studies have being carried out in the area of science education and sustainable development. Ohunene and Ozoji (2014). Investigated science education and sustainable development in Nigeria. Kola (2013) investigated importance of science education to national development and problems militating against its development. Christiana (2012) conducted revisiting science education and national development: Nigerian situation and the way out. Daso (2013) also conducted science education reforms in Nigeria: implication for science teachers. There are several areas on science education and

sustainable development that are yet to be covered by these scholars. These areas include head teachers role in managing science education toward sustainable development in North-Central zone, Nigeria. Also, those studies did not carried out in junior secondary schools. This study on head teachers role in managing science education towards sustainable development in north-Central zone, Nigeria therefore endeavour to fill part of these gaps yet to be covered.

PURPOSE OF THE STUDY

This study is a descriptive survey which investigated head teacher role in managing science education towards sustainable development in North-Central Zone, Nigeria. Specifically, the purpose of the study includes to:

- (1) Determine the relationship between head teachers' way of motivating science teacher and sustainable development in public junior secondary schools in north-central zone.
- (2) To ascertain the relationship between head teachers' method of supervision and sustainable development in public junior secondary schools in north-central zone.

Research Questions (RQs)

The following research questions were raised to guide the conduct of this study:

RQ1: how do public junior secondary school head teachers motivate their science teachers in north-central zone, Nigeria?

RQ2: what is the method of supervision used by head teachers in public junior secondary school in north-central zone, Nigeria?

Research Hypotheses

To guide the conduct of this study, the following hypotheses were formulated and answered:

H0₁: There is no significant relationship between head teachers' way of motivating science teachers and sustainable development in public junior secondary schools in north-centralzone, Nigeria.

H0₂: There is no significant relationship between head teachers' method of supervision and sustainable development in public junior secondary schools in north-central zone, Nigeria.

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive research design. This research design is appropriate for this study because it allows collection of data from the sample of target population, also to analyze data collected using appropriate data analysis technique and get reasonable conclusion about the findings of the study.

This study focus on public junior secondary schools in North-Central Zone, Nigeria. There are 2,335 public junior secondary schools in North-Central Zone, Nigeria. The target population of this study consisted of all the teachers and head teachers in public junior secondary schools in North-Central zone, Nigeria. Proportionate random sampling technique was used to select sample of 331 public junior secondary schools out of 2,335 in seven States which includes Benue (75 schools), Federal Capital Territory (10 schools), Kogi (79 schools), Kwara (47 schools), Nasarawa (26 schools), Niger (54 schools) and Plateau (40 schools) with the use of Krejcie and Morga table of determine sample size (1970) as shown in Table 1. The technique is appropriate for this study because it enhance the selection of a true sample of the target population. Purposive random sampling technique was used to select four science and technology teachers (basic science, basic technology, agricultural science, cultural and creative art) from each sample schools making a total number of 1,324 as shown in Table 1.

Table 1: Population Sample

S/N	North-Central zone	Total school	Sample schools	Selected teachers
1	Benue	526	75	300
2	FCT	77	10	40
3	Kogi	555	79	316
4	Kwara	330	47	188
5	Nasarawa	181	26	104
6	Niger	381	54	216
7	Plateau	285	40	160
Total		2335	331	1324

Source: Universal Basic Education Commission (2013), Abuja, Nigeria

Instrumentation

The instrument used for data collection for this study was researchers' constructed questionnaire titled "Head Teacher Managing Science Education and Sustainable Development Questionnaire" (HTMSESDQ) was used for the study. The instrument was in two sections. Section A contains personal information of teachers, while section B was used to elicit data concerning head teachers' role.

To ensure content validity of the instruments, draft copy of the instruments were given to two experts in the Department of Educational Management and two experts in measurement and evaluation. Reasonable corrections were made based on their observations, recommendations and modifications. Therefore, the final copies was produced and used for data collection.

The reliability of the instruments was determined using test-retest method. This was done by administering copies of questionnaire to teachers who were not part of the sample of the study. The instruments were re-administered to the same set of teachers three weeks of the initial sampling. The two sets of data were correlated using Pearson moment correlation statistic. The reliability value were 0.08. This value showed that the instrument was reliable.

The corrected questionnaire for the study was personally administered to the teachers in the sampled schools with the help of six trained research assistants in order to ensure higher response rates. This method facilitated on the spot collection of the completed copies of the instrument.

Data collected for this study was analyzed using SPSS version 20. The research questions one and two were answered using mean and standard deviation while Pearson product moment correlation coefficient statistic was used to test the hypotheses. The P-value was compared to the significant level (0.5) to determine the rejection or the acceptance of the hypotheses.

DATA ANALYSIS AND RESULTS

Weighted mean and standard deviation were used to provide answers to the research questions raised

Research Question one: How do public secondary school head teachers motivate their teachers in north-central zone, Nigeria?

Table 2

Head Teachers' Motivation in Public Junior Secondary Schools in North-Central Zone, Nigeria

S/N	Head teachers' motivation	Response of Teachers		
		Mean	SD	Decision
1.	Head teacher encourages science teachers to go for in-service training to update their knowledge and skills.	2.89	0.964	Agreed
2.	Head teacher gives written commendation to hardworking science teachers so as to be effective.	2.96	0.933	Agreed
3.	Head teacher helps science teachers morally and materially in times of need to ensure good performance by teachers.	2.94	0.962	Agreed
4.	Head teacher assists science teachers to get promotion as at when due.	2.86	1.018	Agreed
5.	Head teacher gives science teachers adequate authority to execute their duties.	2.87	0.994	Agreed
	Grand mean	2.90	0.974	

(Mean \geq 2.50 Agree, Mean $<$ 2.50 Disagree)

Source: field survey, 2016

Table 2 showed that, items with serial number 1 – 5 have their various mean and grand mean values above the criterion mean of 2.50 and high standard deviation score. Therefore, respondents agreed that head teachers' ways of motivating science teachers by encourage them to go for in-service training to update their knowledge and skill, gives written commendation to hardworking teachers, help them morally and materially to ensure good performance, assist teachers to get promotion as at when due as well as gives adequate authority to teachers to execute their duties is effective towards sustainable development in public junior secondary schools in North-central zone, Nigeria.

Research Question two: What is the method of supervision used by head teachers in public junior secondary school in north-central zone, Nigeria?

Table 3

Head Teachers' Methods of Supervision in Public Junior Secondary Schools in North-Central Zone, Nigeria

S/N	Head teachers' supervision	Response of Teachers		
		Mean	SD	Decision
1.	Head teacher act as a guide during supervision.	2.90	0.961	Agreed
2.	Head teacher provides constructive criticism diplomatically during supervision in the class.	2.95	0.934	Agreed
3.	Head teacher initiate current practice and methods of teaching in science education.	2.95	0.958	Agreed
4.	Head teacher respect the view and opinion of his staff during supervision.	2.87	1.015	Agreed
5.	Head teacher uses the method of supervision which is democratic in nature.	2.89	0.990	Agreed
	Grand Mean	2.91	0.972	

(Mean \geq 2.50 Agree, Mean $<$ 2.50 Disagree)

Source: field survey, 2016

Table 3 showed that, items with serial number 1 – 5 have their various mean and grand mean values above the criterion mean of 2.50 and high standard deviation score. Therefore, respondents agreed

that head teachers' supervision of science teachers in public junior secondary schools is effective towards sustainable development in North-central zone, Nigeria by acting as a guide during supervision, provide constructive criticism diplomatically during supervision in the classroom, initiate current practices and methods of teaching, respect the view and opinion of teachers as well as uses method of supervision which is democratic in nature.

Hypotheses Testing

The null hypotheses formulated to guide the study were tested, using Pearson product-moment statistic technique at 0.5 level of significance as follows:

H₀₁: There is no significant relationship between head teachers' ways of motivating teachers and sustainable development in public junior secondary schools in north-central zone, Nigeria.

Table 4

Head teachers' Ways of Motivating Teachers and Sustainable Development

Variable	N	\bar{x}	SD	df	Cal-r	P.value	Decision
Head teachers' motivation	1324	11.73	3.965	2646	0.92	.000	Rejected
Sustainable development	1324	2.79	1.991				

Table 4 indicates that there was a significant positive correlation between head teachers' motivation of teachers and sustainable development in North-Central zone, $r(1324) = 0.92$, $p < 0.05$. The hypothesis that there was no significant relationship between head teachers' motivation of teachers and sustainable development in North-Central zone public junior secondary schools was, therefore, rejected.

H₀₂: There is no significant relationship between head teachers' method of supervision and sustainable development in public junior secondary schools in North-Central zone, Nigeria.

Table 5

Relationship between Head Teachers' Methods of Supervision and Sustainable Development

Variable	N	\bar{x}	SD	Df	Cal-r	P.value	Decision
Head teaches' supervision	1324	11.81	3.882	2646	0.91	.000	Rejected
Sustainable development	1324	2.75	1.949				

Table 5 indicates that the Pearson product-moment correlation test revealed a significant positive correlation between head teachers' methods of supervision and sustainable development in public junior secondary schools in North-Central zone, $r(1324) = 0.91$, $p < 0.05$. The hypothesis that there was no significant relationship between head teachers' methods of supervision and sustainable development in public junior secondary schools in North-Central zone was, therefore, rejected.

DISCUSSION OF FINDINGS

The results of data analyzed to answer the research question one in table 2 shows that majority of public junior secondary school head teachers maintained appropriate motivation with their science teachers which involves encourage them to go for in-service training to update their knowledge and skill, gives written commendation to hardworking teachers, helping teachers morally and materially to ensure good performance, assist them to get promotion as at when due as well as give teachers adequate authority to execute their duties. Findings from hypothesis one revealed that there is a significant relationship between head teachers' motivation of science teachers and sustainable development in North-Central zone, Nigeria. This finding conformed to Hattie (2009) that teachers remain the most important factor for educational reform because what teachers believe and think affects their teaching. Therefore, teachers need to be well motivated in order to successfully reform teaching

practices toward achieving sustainable development. This finding also agreed with Okoli, Obiajulu and Ella (2013) that science teachers should be well paid so that it will serve as a way of motivating them to put in their best in teaching students toward sustainable development.

The result of data analysis to answer research question two in table 3 and hypothesis two in table 5 revealed that head teacher supervision of their science teachers as part of achieving sustainable development is adequate by act as a guide during supervision, provide constructive criticism diplomatically during supervision in classroom, initiate current practices and method of teaching, respect the view and opinion of teachers as well as uses the method of supervision which is democratic in nature in North-Central zone, Nigeria. The finding from hypothesis two revealed that there is a positive and significant relationship between head teachers' method of supervision and sustainable development in North-Central Zone, Nigeria. This findings agreed with Ohunene and Ozoji (2014) that quality science education leads to acquisition of relevant skills and knowledge required for sustainable development. This findings also agreed with Kola (2013) that government should invest on science education in order to provide job for people and scholarship for science students.

CONCLUSION

The development of any country depend largely on its level of scientific literacy. There is no doubt that if head teachers role in managing science education is fully implemented it will accelerate the achievement of sustainable development in North-Central Zone, Nigeria. This can be done by giving appropriate and necessary motivation to science teachers as well as provide adequate supervision which is democratic in nature to science teachers. The findings of this study show that head teachers motivating their teachers appropriately. Furthermore, head teachers in public junior secondary schools in north central maintained appropriate method of supervision in order to enhance sustainable development.

RECOMMENDATIONS

- (1) Head teachers should continue to motivate their teachers by encouraging them to go for in-service training, gives written commendation to hardworking teachers, helping them morally and materially as well as giving them adequate authority to execute their duties in order to achieve quality education for sustainable development.
- (2) Head teaches should continue to use appropriate methods of supervision by act as a guide, respect the view and opinion of teachers as well as supervise them democratically for the achievement of sustainable development in public junior secondary schools in North-Central zone, Nigeria.

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