



**Determinants of Science Education Programme for Sustainable Local Content Policy in Bayelsa State, Nigeria**

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**Abstract**

*The study investigated the determinants of science education for a sustainable local content policy in Nigeria. Descriptive survey design was adopted and three research questions and three null hypotheses were generated to guide the study. The instrument for data collection was a Determinants of Science Education Programme for Sustainable Local Content Policy Questionnaire (DSEPSLCP), which consists of 18-items in a 4-point Likert rating scale. The instrument was subjected to reliability test which yielded a reliability coefficient of 0.85 using Kuder-Richardson formula 21(KR21). The population of the study was made up of all lecturers of science education programmes in all tertiary institutions in Bayelsa State that offer programmes in science education. The sample consisted of one eighty five lecturers drawn from three (3) tertiary institutions through proportionate stratified sampling technique. Data gathered were analyzed using mean, standard deviation and chi-square statistics. Findings revealed that science education programmes have a vital role to play for the Nigeria Local Content Act to be sustained. Therefore it was recommended that the Nigerian Content Development and Monitoring Board should allocate more funds to science and technology based institutions.*

**Keywords:** determinants, Science Education programme, Local Content Policy sustainable.

**Introductions**

Education is the acceptable process which enables the learner to study and learn those skills, attitudes, knowledge and values of the society in readiness to live a meaningful life and to contribute to the development of the society. To achieve these objectives an effective system of education has to be put in place that will equip learners with the required skills, knowledge, attitude and values. Education is indisputably recognized as the bedrock of any meaningful development, while Science Education programme is the cornerstone for any sustainable development programme (Ibe, 2017).

The oil and Gas sector is the live-wire of Nigerian Economy. The desire of Nigeria to ensure that a greater portion of the profit from the Oil and Gas industry is translated into improved welfare of her citizens led for the enactment of the Nigeria Local content Act of 2010, also called the Nigerian Oil and Gas content Law (2010). The policy is primarily aimed at increasing local participation of indigenous firms in the Oil and Gas industry. The Local content policy is hinged on transforming the indigenous Oil and Gas industry through the development of in-country



capacity and capabilities in man-power development, facilities and infrastructure, (Omeodu & Charles–Owaba, 2018).

Ihua (2010) Submitted that;

*“the Oil and Gas business is high risk business, requiring skilled technical manpower and that only an effective educational system that understands the human resource needs of the industry and tries to match their resources to meeting those needs can enhance the prospects of higher local content, without which the whole idea of local content is a mirage, only ending as prospects.”*

Bolouga (2015) and Sigrid (2015) independently submitted that the greatest limitation to the implementation of the local content policy is the lack of indigenous experienced personnel with adequate technical knowledge in the Oil and Gas sector. Gausi-Obaseki (2010) further opined that Local Content Policy works optimally to create value where the necessary scientific and technological skills and knowledge are available and utilized. Buseri (2003) defined Science Education as the application of educational theories especially, those based on the philosophical, sociological and psychological perspectives in the endless search for knowledge, resulting in the development of the cognitive, affective and psychomotor domains through some systematic process involving careful observation, deduction and testing by empirical means. Oguniyi (2010) defined science education as a field of study that is concerned with producing learners with the right scientific skills and attitudes needed to pursue science based disciplines such as engineering, architecture, computer science, medicine, etc. Since the implementation of the local content policy requires skilled personnel in the oil and gas sector and science education on the other hand can produce the required skills, then there is need for the right collaboration with the oil and gas sector to enable it produce the required scientific and technical skills and attitudes.

### **Concept of Science and Science Education**

Ekokotu (2011) defined science as that knowledge obtained through observation and analysis of events or natural phenomena that ensures control over the environment. Idoko (2011) defined science as a body of knowledge arrived at and accumulated following some well-known procedures generally referred to as scientific method. Science is central to the developmental prospects of a nation; it provides tools that help to alleviate specific problems that afflict the nation and which impede their development prospects such as disease, infrastructural decay, and environmental degradation. Science is also central to the dynamics of a nation’s economic growth; through the provision of marketable labour supply, reduction of unemployment and underemployment, infuse technical knowledge and the reduction of poverty. Thus, Olukayode and Dahud(2011) reported that economically, successful countries are those that have given science the right position in their quest to foster indigenous innovation capacity.

Education is the total process of human learning by which knowledge is total process of human learning by which knowledge is imparted, faculties trained and skills developed” (Urevbu, 2001). Science education is a field of study that acquaints learners with certain basic knowledge, skills and attitude needed for future work in science and science related fields. Ayonmike and



Okeke(2015) see science education as a systematic and orderly transmission of knowledge, skills and values to develop a workforce that is able to enhance productivity and sustain competitiveness in global economy.

Oguniyi (2010) posited that science education is a process of inculcating into science, which means science education prepares individuals for the world of work and is also a viable tool for sustainable development. The Nigeria government like all other governments in the world realizes the role of science and its by product-technology in issues of National development. It is for this reason that its promotion is enshrined in section 18 (2) of 1999 constitution of the federal Republic of Nigeria.

The goal of science education in Nigeria according to the National Policy of Education (FNR; 2014) are to:

1. Cultivate inquiring, knowing and rational mind for the conduct of a good life and democracy.
2. Produce Scientist for National development.
3. Services Studies in technology and the cause of technological development.
4. Provide knowledge and understanding of the complexity of the physical world, the forms and the conduct of life.

Despite the Universal recognition of the numerous benefits of science education and the subsequent action of giving it a special place, evidence abound that it has been plagued with a lot of challenges. Babajide (2015) identified poor funding, poor instructional methods lack of basic infrastructure and poor management as the problems of science education in Nigeria. Also Kola (2013) outlined security, corruption political, Economy and Science Teachers as the problems of Science Education in Nigeria. The educational sector has been plagued with the problem of poor funding and this has constituted a major problem in science education programme. The world bank survey on education in Nigeria reported that the Federal Government expenditure from 1960 to 2019, revolves within the range of 0.88% to 17.59% of the total budget, as against the benchmark of 26% proposed by UNESCO for developing countries of which Nigeria is a part off.

### **Concept of Local Content and Nigeria Local Content Act**

Local content is defined by different authorities in different ways (Gbegi and Adebisi, 2013). World Bank (2013) defined local content as a policy that evolved from creating background linkages by supplying input to the local economy through transfer of technology, the creation of local employment opportunities and increasing local ownership and control. International Petroleum Industry Environmental Conservation Association; IPIECA (2011) defined local content as the added value brought to a host nation (National, Regional and Local areas in that country including communities) through the activities of the oil and gas industry. To IPIECA, local content includes all activities that are mainly workforce development (employment of local workforce and training of local workforce) and investments in supplier development (developing suppliers and services locally and procuring supplies and services locally).

The Nigeria Oil and Gas Industry Content Development Act(2010) defines local content as: the quantum of composite value added or created in Nigeria through utilization of Nigerian resources and services in the petroleum industry resulting in the development of indigenous capability without compromising quality, health, safety and environmental standards. Ayonmike and Okeke (2015) observed that local content is standard practice undertaken by resource-rich countries of the world. They further stated that while some countries approach it from the point of



view of an economic tool which will ultimately create local capacity and capabilities that can compete with foreign companies and in the process develop their economies, other view is as a protectionist measure to protect their local technology and services from misappropriated foreign competition as a result of globalization, thereby retaining the value of their local technology and services within the borders of their countries. Therefore, the definition of local content from the Nigerian context is mainly concerned with the creation of local capacities and capabilities that can add value to the oil and gas sector for the overall benefits of the economy (Obasa, 2013).

## **Nigeria Local Content Act**

The first move to create a local content policy in Nigeria was in 1969, through the enactment of 1969 Petroleum Act. The local content policy was enshrined in Article 26. The Petroleum Act was a mere paper work (Ayonmike & Okeke 2015). The second move to enact the policy started in 1971, with the establishment of the Nigerian National Oil Corporation (NOC). The NOC was the vehicle for the promotion of Nigeria's indigenization policy in the oil and gas sector. In 1977, the Petroleum Ministry was merged to the NOC to form the present day Nigerian National Petroleum Corporation (NNPC). Finally, in 2010, the Nigerian Local Content Act was signed into law as Nigeria Oil and Gas Industry Content Development Law. The objective of the Act is to increase indigenous participation in the oil and gas industry. The Act is designed to promote local participation within the industry, that is, Nigerian incorporated companies. The Act is framed within the context of growth of Nigerian entrepreneurship and domestication of assets to fully realize Nigeria's strategic developmental goals. Balouga (2015) reports that the Act has a scheme with a potential to create over 30,000 jobs in the next 5 years and is geared to increasing the domestic share of the \$18billion annual spending on oil and gas from 45% to 70%, in addition to enhancing the multiplier effect on the economy refining and petrochemicals.

## **Statement of the Problem:**

The desire for Nigeria to exercise greater control on the exploitation, exploration and production activities of oil and gas sector led to the enactment of the Nigeria Local content act in 2010. Nine years after its existence the much expected boom in economy value addition and job creation is yet to be felt in the country. Obasa(2013), Sigrud (2015), Bolouga (2015), submitted that one of the greater barrier to the implementation of the Local content Policy is the lack of indigenous skills and capacity. Gaus-Obaseki (2010) reported that available and utilized necessary scientific and technological skills and knowledge are prerequisites for the Nigeria Local Content Policy to work optimally. Omeodu etal (2018) noted that the right collaboration between Science Education and the Oil and Gas sector is a requirement for the effective implementation of the Nigeria Local Content Policy. Therefore this study sought to investigate the determinants of Science Education programme that will aid a sustainable Local Content Policy.

## **Purpose of the Study**

The purpose of this study is to investigate determinants of Science Education Programme for sustainable Local Content Policy in Bayelsa. Specifically, the study sought to determine the following:



1. The role of funding as determinants of Science Education Programme for sustainable Local Content Policy.
2. The role of quality Instructional delivery as determinants of Science Education Programme for sustainable Local Content Policy.
3. The role effective arrangement as determinant of Science Education Programme for sustainable Local Content Policy.

## Research Questions

The following research questions were formulated to guide the study;

1. What are the roles of funding as a determinant of Science Education Programme for sustainable Local Content Policy?
2. What are the roles of quality instructional delivery as a determinant of Science Education Programme for sustainable Local Content Policy?
3. What are the roles of effective management as determinants of Science Education for sustainable Local Content Policy?

## Null Hypotheses

The under listed null hypotheses were formulated and tested at 95% significant level.

1. There is no significant relationship between funding as a determinant of Science Education Programme and the sustainability of Local Content Policy.
2. There is no significant relationship between quality Instructional delivery as a determinant of science education and the sustainability of the Local Central Policy.
3. There is no significant relationship between effective management as a determinant of science education programmes and the sustainability of local content policy.

## Methodology

This study adopted a descriptive survey design. The population of the study consisted of all science education lecturers in all tertiary institutions of Bayelsa State. A proportionate stratified random sampling technique was used to draw lecturers from 6 options in science education department from the three tertiary institutions in the state. The 85 lecturers drawn from the various options formed the sample of the study. The instrument for data collection was a Determinant of Science Education Programme for sustainable Local content policy Questionnaire (DSEPSLCP). The instrument was developed by the researcher. It consist of two (2) sections, namely section A and B. Section A measured the demographic variables of the respondents, while the section B was made of 18 – items on the variables coded on a 4 point likert scale of strongly agree = 4, agree = 3, disagree = 2 & strongly disagree =1. The content and face value of the instrument was done by one expert from measurement and evaluation and two others from Science Education Department, of Rivers State University Port-Harcourt. Their corrections and suggestions resulted to the final draft used in the study. The instrument was trial tested using twenty (20) other science education lecturers that did not participate in the research but possess the same characteristics of the population of interest. The reliability coefficient of 0.87 was obtained using Kuder-Richardson Formula (K-R 21), which was considered appropriate for this study. The researcher administered the questionnaire to the respondents personally and in all 100% return rate was achieved. The data was analyzed using means and standard deviation for the research questions and chi-statistics at



0.05 level of significance to test the research hypotheses. Any item with a mean value above 2.3 was accepted, while those with 2.5 below were rejected.

## Results and Findings

**Research Questions 1:** What are the Roles of Funding as a Determinant of Science education programme for Sustainable Local Content Policy?

**Table 1:** Mean and Standard Deviation of respondents on the role of Funding as a Determinant of Science Education programme for Sustainable Local Content Policy.

S/ N	ITEMS	$\bar{X}$	SD	Remarks
1.	Funding will aid effective science education quality assurance agencies in Nigeria	2.65	0.80	Agreed
2.	Funding will aid effective training and retraining programmes for Science Educators.	3.00	0.86	Agreed
3.	Funding will establish proper implementation of Science Education	2.75	0.81	Agreed
4.	Good welfare package will inspire Science Educators for better instructional delivery	3.41	0.83	Agreed
5.	Availability of funds will lead to recruitment of qualified personnel in Science Education.	2.85	0.82	Agreed
6.	Availability of funds will lead to maintaining conducive learning environment	2.75	0.81	Agreed
	Grand Mean	2.90		Agreed

Source: Field survey, 2019

The results of the analysis presented in Table 1 shows that all items were rated as ‘Agree’ by the respondents. The grand mean scores of 2.90 shows that the respondents agreed that funding is a determinant of science policy, in Nigeria. The standard deviation which ranged between 0.81-0.85 indicates that there is closeness of opinion of respondents.

**Research Question 2:** What are the roles of Quality Instructional Delivery as a Determinant of Science Education Programme for Sustainable Local Content Policy?

**Table 2:** Mean and Standard Deviation on the Roles of Quality Instructional Delivery as a Determinant of Science Education Programme for Sustainable Local Content Policy.

S/ N	ITEMS	$\bar{X}$	SD	Remarks
7.	Computer aided instructional delivery will enhance effective science education programme in Nigeria	2.65	0.90	Agreed



8.	Research aimed at improving pedagogy in science education yield quality output	3.00	0.86	Agreed
9.	Devoting time on best pedagogical practices will establish proper implementation of Science Education policy	3.15	0.91	Agreed
10.	Good welfare package will inspire Science Educators for better instructional delivery	3.41	0.93	Agreed
11.	Availability of funds will lead to recruitment of qualified personnel in Science Education.	2.85	0.92	Agreed
12.	Availability of learning resources will lead to quality instructional delivery in science education.	3.08	0.81	Agreed
	<b>Grand Mean</b>	<b>3.06</b>		<b>Agreed</b>

*Source: Field survey, 2019*

The result in Table 2 shows that all items were rated agreed by the respondents. The grand mean of 3.06 shows that the respondent agreed that quality instructional delivery is a determinant of science education for sustainable Local Content Policy. The standard deviation ranging from 0.80-0.93 indicates closeness in the opinion of respondents.

**Research Question 3:** What the roles of Effective Management as Determinant of Science Education Programme for Sustainable Local Content Policy?

**Table 3:** Mean and Standard Deviation of Respondents on the Roles of Effective Management as a Determinant of Science Education Programme for Sustainable Local Content Policy in Nigeria

S/N	ITEMS	$\bar{X}$	SD	Remarks
13.	Proper Management will improve Science Education Programme	2.75	0.80	Agreed
14.	Planning and organizing effecting SIWES Programme	2.93	0.85	Agreed
15.	Sponsoring and Supervising Field trip	2.54	0.75	Agreed
16.	Adequate provision of consumables	2.60	0.78	Agreed
17.	Enduring funds allocated are properly utilized for the general improvement of Science Education Programme	2.83	0.83	Agreed
18.	Maintaining conducive Learning Environment	3.05	0.85	Agreed
	<b>Grand Mean</b>	<b>2.78</b>		

*Source: Field survey, 2019*

The result in Table 3 shows that all items were rated agreed by the respondents. The grand mean of 2.78 shows that the respondent agreed that effective management is a determinant of science education for sustainable Local Content Policy. The standard deviation ranging from 0.740-0.853 indicates closeness in the opinion of respondents.



**Null Hypothesis 1:** There is no Significant Relationship between Funding of Science Education Programme and the Sustainability of Local Content Policy.

**Table 4:** Chi-square Statistic on Funding as a Determinant of Science Education Programme for Sustainable Local Content Policy

Statistics	df	P	Value	Decision
$X^2_{cal}$	15	0.05	11.42	Reject Ho
$X^2_{tab}$	15	0.05	16.92	

From the Table 4,  $X^2_{cal}$  is 11.42, while  $X^2_{tab} = 16.92$ . Since  $X^2_{tab}$  is greater than  $X^2_{cal}$ , therefore the null hypothesis ( $H_{01}$ ) is rejected. This implies that funding is a determinant of science Education programme for sustainable Local content Policy.

**Null Hypothesis 2:** There is no Significant Relationship between Quality Instructional delivery as a Determinant of Science Education and the Sustainability of the Local Central Policy.

**Table 5:** Chi-square statistic on quality instructional delivery as a determinant of Science Education Programme for sustainable Local Content Policy

Statistics	df	P	Value	Decision
$X^2_{cal}$	15	0.05	7.04	Reject Ho
$X^2_{tab}$	15	0.05	16.92	

*Source: Field survey, 2019*

From the Table 5,  $X^2_{cal}$  is 7.04, while  $X^2_{tab} = 16.92$ . Since  $X^2_{tab}$  is greater than  $X^2_{cal}$ , therefore the null hypothesis ( $H_{01}$ ) is rejected. This implies that quality instructional delivery is a determinant of science Education programme for sustainable Local content Policy.

**Null Hypothesis 3:** There is no Significant Relationship between Effective Management as a Determinant of Science Education Programmes and the Sustainability of Local Content Policy.

**Table 6:** Chi-square Statistic on Effective Management as a Determinant of Science Education Programme for Sustainable Local Content Policy

Statistics	Df	p	Value	Decision
$X^2_{cal}$	15	0.05	11.45	Reject Ho
$X^2_{tab}$	15	0.05	16.92	

*Source: Field survey, 2019*

From the Table 6,  $X^2_{cal}$  is 11.45, while  $X^2_{tab} = 16.92$ . Since  $X^2_{tab}$  is greater than  $X^2_{cal}$ , therefore the null hypothesis ( $H_{01}$ ) is rejected. This implies that effective management is a determinant of science Education programme for sustainable Local content Policy.

### Summary of Findings:

The result of the findings indicated that:

1. Lecturers of Science Education Programme agree that funding is a determinant of Science Education Programme for sustainable Local Content Policy.



2. Lecturers of Science Education agree that quality instructional delivery is a determinant of Science Education Programme for sustainable Local Content Policy.
3. All respondents agree that effective management is a determinant of Science Education Programme for sustainable Local Content Policy.

## Discussion of Findings

The study reveals that there is a significant relationship between funding of Science Education Programme and sustainable Local Content Policy in Nigeria. This implies that when Science Education is adequately funded, it will in turn produce the necessary scientific and technological indigenous skill that will dominate the Oil and Gas sector, thereby sustaining the Nigerian Local Content Act (2010). The finding is consistent with Omeoduetal (2018), Charles-Owaba & Moses (2018), who submitted that improved Science Education Programme will sustain that Local Content Policy.

The study revealed that there is a significant relationship between quality instructional delivery and sustainable Local Content Policy. This implies that the quality of instructions teachers and lecturers deliver to learners will aid improved acquaintance and scientific and technological skills and knowledge. This will also sustain Local Content Policy in Nigerian. This finding is consistent with Ihua (2010), Ayomike and Okeke (2015) who posits that the quality of education a nation operates is a pre-requisite for sustainable Local Content Policy. Also the study reveals that there is a significant relationship between effective management of science education and sustainable local content policy. This is consistent with the findings of Ihua (2010), Gbegi and Adebisi (2013), Omeodu e tal (2018), Charles-Owaba etal (2018), who submitted that effective management of the science education process will sustain the Local Content Policy.

## Conclusion

This study investigated the role of funding, quality instructional delivery and effective management as determinant of science education programme for sustainable Local Content Policy. It was established that funding, quality instructional delivery and effective management of Science Education Programme have a significant relationship with sustainable Local Content Policy.

## Recommendations

Based on the findings of this study, the following recommendations were made;

1. The Nigerian Content Monitoring and Development Board should ensure that a portion of their fund is allocated to science and technology based institutions for improved science education programme.
2. The Government should ensure that the required management team is in place to ensure that there is strict adherence to educational standards.
3. The Nigeria Content Monitoring and Development Board should continue to sponsor science based programme that will create the required awareness on the need for indigenous domination of the Oil and Gas Industry

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