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SCIENCE AND TECHNOLOGY A MECHANISM OF DEVELOPMENT IN AFRICAN COUNTRIES

Ohwojero Chamberlain Joseph
Delta State University Secondary School Abraka Delta State Nigeria. West Africa

Abstract: *Science and technology has made a remarkable impact in the development of many nations' economy in this 21st century. The application of scientific knowledge in production has made tremendous development of infrastructures. Technology has elevated the economy of many nations through the introduction of modern technology that brought comfort and stability in man's life. The foundation of technology is science; it is justifiable to say that science is the power of technology. The application of scientific knowledge has helped man to produce modern infrastructures and amplified the development of many nations. This study is focused on comparing the impact of science and technology in the developing nations. Questionnaire was the main instrument used for data collection. Data collected were analysed using descriptive statistics to find the mean difference of science and technology. Findings and recommendations were made based on analysis of data.*

KEYWORDS: Science and Technology, Impact of Science and Technology.

INTRODUCTION

Science and technology is the prime mover or pilot of economical growth of many nations. Adikwu, (2008) opined that for a nation to experience economic growth there must be a strong stimulation of science. Science the originator of technology is described as a body of empirical, theoretical and practical knowledge about the natural world that is produced by scientists who emphasize the observations, explanations and prediction of real world phenomena.

According to Akpokodje, (2010) science and technology has transformed our world into a global village through the emergence of instant communication. One can watch events in any part of the world as they happen through live television broadcast. Technology as a sustainable tool or a driver of economic development that is equipping man with skills and knowledge is fast spreading like a wide fire in this 21st century. The technological development from 19th century till date, compared to the early life of man up to 19th century cannot be quantified in terms of infrastructural development; it is suffice to say that today man live in an integrated, interdependent and interconnected world, which make up the globalization.

Modern science and technology emanated from the evolution of science in the early history of man. Science may have evolved more than hundred thousand years ago with the evolution of Modern hunter-gatherers (Liebenberg, 2013). Scientific reasoning can be describe as an innate ability of the human mind that involve human thinking as a result of science developing man critical thinking. Today humanity depends on science and technology for survival. Man

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dependence on information technology has helped in solving problems that related to energy production, food production, health science, climate change, and biodiversity conservation. To support this statement, Akpan, (2008) stated that science has contributed to the quality of life in areas like health, nutrition, energy production, agriculture and transportation. A nation can achieve a sustainable and rapid economic development, when it becomes imperative that females are made to participate actively in science and technology (Njoku, 2008). The Justice Development and Peace Commission (2005) stated that women's educational status in any nation correlate to its level of development. To support this statement, Nyerere, (1988) asserts that the way nobody walks far and fast with only one leg, that is how it is in the same way that no nation develops much or fast if half of her population, the female folk are left out in science and technology. Technology has played a fundamental role in wealth creation, improvement of the quality of life and real economical growth and transformation in any society (Egbogah, 2012). Despite the vital role of science and technology in the development of humanity all over the world, science and technology is just rapidly being unfolded in some of the developing nations. Umah, (2008) opined that a lot is need to be done in the area of capacity building for a critical mass of Nigerian engineers, scientists, and environmentalist to tackle future challenges.

Science and technology has provided many nations with vibrant and sustainable economical development. Human beings are made to live a simple and comfortable life because of economic buoyancy. Many nations today experiences good economic buoyancy because of improvement in industrialization. Developed nations like America, Germany, and Great Britain are reaping the dividends of industrialization through the establishment of Automobile industries. The production and sales of Automobile has added values to human lives and economic growth of many developed nations. Odiboh cited in Bisiriyu, (2012) stated that a country economy sometimes depend on the Automobile industries that they have. Technology has been very useful to man's daily activities by making work to be easier and faster with less effort than it used to be in the past, when man was still associating himself to the use of crude farm tools for his agricultural practice, rather than practicing mechanized agriculture etc.

Statement of the Problem

Science and technology has elevated the economic status of many nations through industrialization. But some developing nations like Nigeria, Togo, Cameroon etc in Africa has benefited immensely from science and technology. But lack's manpower which is the technical know -how of technology. Most African countries are not self-sustainable but rather a dependant of other nations' technology. Nigerian citizens lack technological skills of managing industries that will improve production of technological goods and services; that has affected the economic status of many developing nations.

Research Questions

The following research questions were raised to guide the study:

1. What impact will science and technology have on human level of thinking and development?
2. What impact will science and technology have on man level of skill development?

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3. What impact will science and technology have on economic improvement of developing countries?

Research Design
The descriptive survey research design was used in the study.

Population of the Study
The population of the study comprise of staffs of works and services department of the three oil company in Africa, namely Addax Petroleum Limited in Cameroon, Nigerian National Petroleum Corporation (NNPC) in Nigeria and Chevron Oil Company in Liberia.

Sampling Technique
The simple random sampling technique was used to select three hundred (300) staffs from the three different establishments that were used for the study from the three countries, among other African countries.

Instrumentation
Questionnaire was the major instrument that was used for the collection of data. The construction of the instrument was based on the three research questions that were raised. The instrument contains fifteen (15) items that was based on human level of thinking, level of skill development and level of economic development in the developing nations.

Reliability of the Instrument
The instrument was given content and construct validity to check for internal consistency of the instrument. Fifteen staffs of Nigerian National Petroleum Corporation (NNPC) in Nigeria from works and services department were used for pilot test to check for the content and construct validity of the instrument. The fifteen staffs that were used in the pilot test are not part of the population used for the study. The Chronbach alpha was used to analyse every item for quality selection. Every item that has low alpha value was eliminated from the poll of items, total items in the poll was 50 items. The retention of item for inclusion in the final selection of items was based on the inter-items analysis. All the items in the instrument was determined and tested for significance at $p < .05$ level of significance where the Cronbach alpha was calculated and the total alpha value of the thirty items (30) was 0.68 after the elimination of twenty (20) items from the pool. To evaluate all the items for content and construct validity the factor analysis was used by first processing the descriptive statistics of the items in the scale to know all the initial communalities of mean and standard deviation of all the items. The thirty items (30) selected was used to compute the content, construct and Theta reliability test of the thirty (30) items using the factor analysis that was carried out. To calculate the reliability of the instrument the alpha value of the instrument was 0.70; items that have alpha value that is below 0.70 were eliminated from the pool of items to get the fifteen (15) items. Descriptive statistics and Factor analysis was used to check for the content and construct validity, by first using descriptive statistics to check for the mean and standard deviation of each item. The factor analysis was used to check for the Eigen value of each component, and Eigen value that is above 1 which was used to select each factor or component. The factor matrix of all the factors was rotated to determine the sum of the square

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loading of each item. This reveals the true Eigen value of each component. From the Eigen value of each component that is above the scale value of above 50%, it therefore shows that all the fifteen (15) items has a content validity. Since the Eigen value of above 1 was used to select the factors of the items that were rotated to get the square loading of each item, and the factor loading matrix each item is above 50%, but in different value of percentage then it means that the instrument has construct validity.

Administration of the Instrument

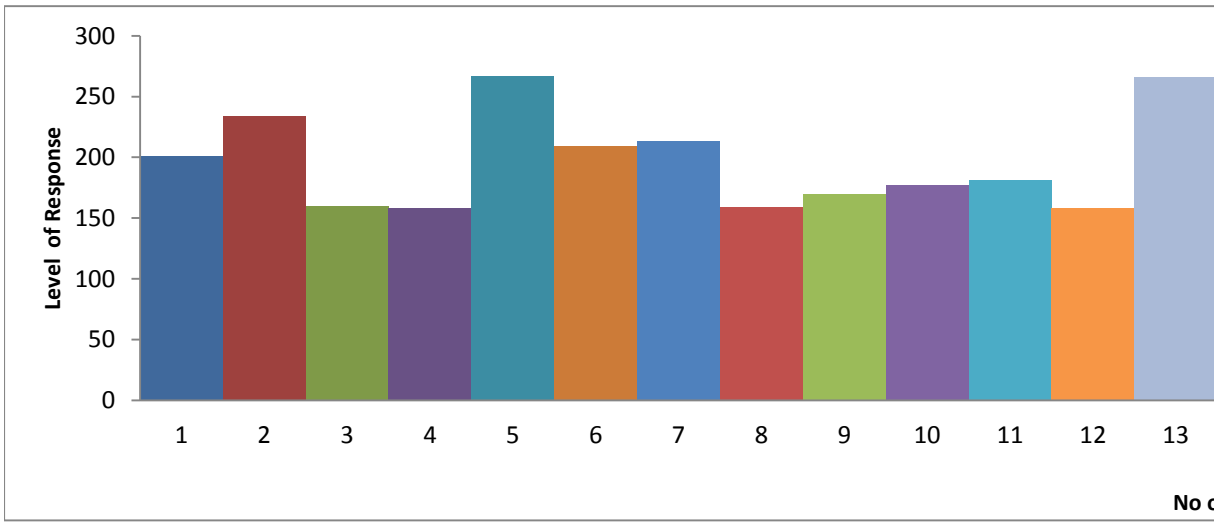
The instrument was taken to the three groups of staffs in their different establishments for a period of one month in each of the countries to administer the questionnaire through the assistance of the workshop supervisors. The staffs read and responded to the items by ticking the option that appear correct to them as their choice. After the administering of the instrument the researcher retrieved the instrument back for data analysis.

Data Collection

Table 1

ITEMS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	**TO**
AGREED	201	234	160	158	267	209	213	159	170	177	181	158	266	213	250	3016
DISAGREED	99	66	140	142	33	91	87	141	130	123	119	142	34	87	50	1484
TOTAL	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	4500

Table I above shows the response of staffs that agreed and the staffs that disagreed in the three establishments after the collation of the data collected.



Histogram chart showing the level of staffs' response in the three establishments that responded agreed

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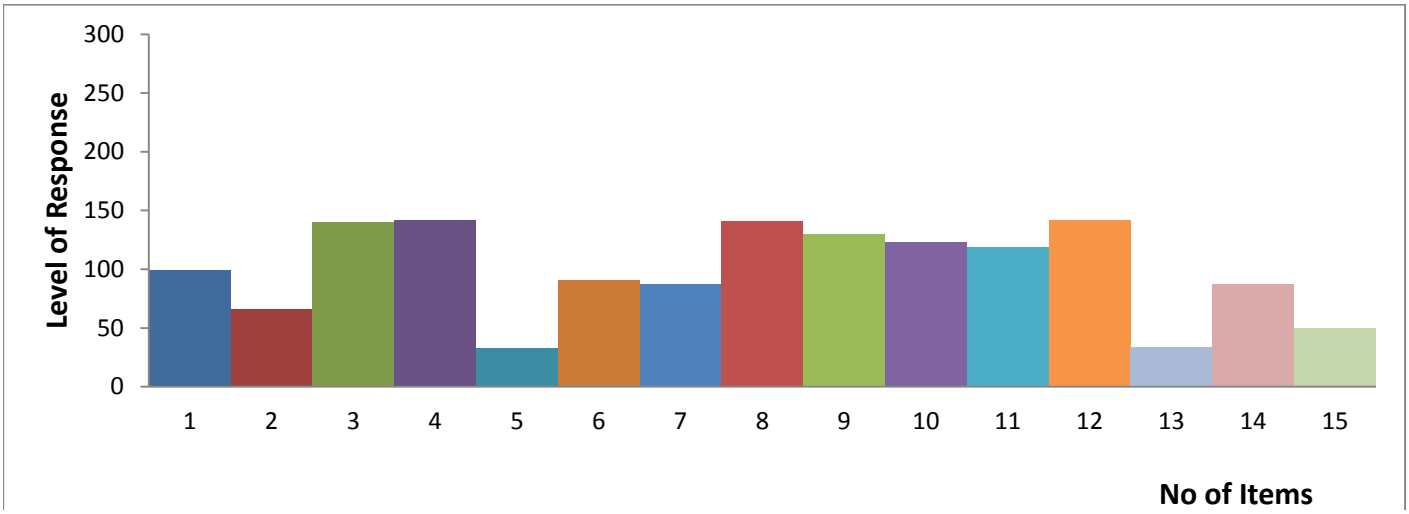

Histogram chart showing the level of staffs' response in the three establishments that responded disagreed

Figure 1and II above shows the level of staffs response from the three establishments used in the study after the administering of the questionnaires. The level of staffs' response agreed from figure I is higher than the level of staffs' response that disagreed in figure II as shown in the histograms.

Data Analysis

Data collected were analysed based on the response of staffs that were used in the study. The descriptive statistics was used to compare the mean response of staffs from the three establishments who agreed and disagreed. The analysis was based on the three research questions, to show the compare mean level of response on the impact of science and technology in the developing nations.

Research Question What impact will science and technology have on human level of thinking and development?

Table II below shows the raw data scores of respondents on item 1 to 5

Table II

ITEMS	1	2	3	4	5	Total
AGREED	201	234	160	158	267	1020
DISAGREED	99	66	140	142	33	480
TOTAL	300	300	300	300	300	1500

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Table III Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Agreed **Disagreed**	**5** **5**	**158.0** **33.00**	**267.0** **142.00**	**204.000** **96.0000**	**47.2493** **47.24934**
Valid N(list wise)	**5**				

From the table III above, the mean response agreed 267.000 on the table is grater < the mean response disagreed 96.0000. Therefore It can be concluded that the number of staffs that agreed that science and technology has an impact on human level of thinking and development is higher than the number of staffs that disagreed in the three establishments.

Research Question II
What impact will science and technology have on man level of skill development?
Table IV below shows the raw data scores of respondents on item 6 to 10.

Table IV

ITEMS	6	7	8	9	10	Total
AGREED	209	213	159	170	177	928
DISAGREED	91	87	141	130	123	572
TOTAL	300	300	300	300	300	1500

Table V Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Agreed **Disagreed**	**5** **5**	**159.0** **87.00**	**213.0** **141.00**	**185.600** **114.4000**	**24.0998** **24.09979**
Valid N(list wise)	**5**				

From table V shown above the mean response agreed 1185.600 is grater than < the mean response disagreed 114.4000. Therefore, it can be concluded that the number of staffs that agreed that science and technology have an impact on man level of skill development is higher when compared to the number of staffs that disagreed in the three establishments.

Research Question III
What impact will science and technology have on economic improvement of developing nations?

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Table VI below shows the raw data scores of respondents on item 11 to 15

Table VI

ITEMS	11	12	13	14	15	Total
AGREED	181	158	266	213	250	1068
DISAGREED	119	142	34	87	50	432
TOTAL	300	300	300	300	300	1500

Table VII Descriptive Statistics

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Agreed **Disagreed**	**5** **5**	**158.0** **34.00**	**266.0** **142.00**	**213.600** **86.400**	**45.3464** **45.34644**
Valid N(list wise)	**5**				

From table VII shown above the mean response agreed 213.600 is grater < than the mean response disagreed 86.400. Therefore, it can be concluded that the number of staffs in the three establishments that agreed that science and technology have an impact on economic improvement of developing nations is higher than number of staffs that disagreed.

DISCUSSION OF FINDINGS

The findings about the study are discussed as follows:

1. The level of staffs response from the histogram chart shown in figure 1 and II from the three establishments shows that the number of staffs that responded agreed was higher compared to the number of staffs that responded disagreed.
2. The response from staffs used in the study indicated that science and technology has made a great impact in the three countries used in the study.
3. The staffs used in the study benefited from science and technology based on the level of their response this shows that science and technology has made a great impact in most developing nations.
4. Science and technology has helped to sustain the economy of many developing nations from the level of response.
5. Science and technology has helped to improve human level of thinking from the response of the staffs used in the study.
6. The staffs that were used in the study lack technological skills based on their response to sum of the items that is in line with research question II. Meaning most of the jobs that require skills are done by expatriates.

RECOMMENDATION

Recommendations are made based on the response of the respondent used in the study.

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1. Government should help to train more personnel to help enhance technological development in developing nations.
2. Government should invest in technological industries to increase the dividends of industrialization.
3. Government of all African countries should encourage science and technology to equip their citizens with modern skills.
4. Government should encourage research among her citizens to encourage technological improvement in most developing nations.
5. Government should site more industries to improve economic buoyancy and skill development in most developing nations.
6. Government should send most workers on service training abroad to help improve their level of technological skill.

CONCLUSION

Science and technology has made a great impact in the life development of man. History has shown that man has been able to live a very comfortable life because of the past and present life style of mans way of living. Science and technology has change mans level of thinking because comparing the past of man to the present there is a great difference in mans way of doing things. From this study it can be concluded that man has benefited from science and technology, meaning science and technology has made a great impact in the life of a man.

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