

Science Students' Competency and Gender as Determinants of Socio-Economic Development in South-West, Nigeria

AdefilaOluwafunmilola Mary, OrireOlufemi Mathew, &
Ayoyinka Bridget Fayoke

Department of Basic Medical Science, Ekiti State College of Health Science and Technology, Ijero Ekiti, Ekiti State, Nigeria

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ABSTRACT

The study was carried out to determine whether science students' competency and gender have influence on socio-economic development. 2 null hypotheses were generated and tested at 0.05 level of significant. The study employed the descriptive research design of the survey type. The population consisted of 10,680 senior secondary school students in South West, and the sample of 130 senior secondary school students in South West, were selected from 4 senior secondary schools using stratified and purposeful random sampling technique. The Instrument used to collect data was questionnaire on Science Students Socio- economic Development (SSSED). The data generated were subjected to inferential analysis using Pearson Product Moment Correlation. Results of the study showed that there was a significant influence of science students' competency on socio- economic development, There was also no significant influence of gender on socio-economic development. Based on the findings of this study, the following recommendations were made: Science Students should be allowed to make use of knowledge derived for socio-economic development, science students should be encouraged and there should be no gender bias in socio-economic development of the Nation.

Keywords: Science students, Competency, Socio-economic, Development

I. INTRODUCTION

Socio-economic development could refer to the simultaneous improvement of a society's social and economic conditions. It involves not only economic growth but also social progress, impacting the well-being of individuals, groups,

and communities. This multifaceted concept is often measured using indicators like GDP, life expectancy, literacy rates, and employment levels.

Social-economic development incorporates public concerns in developing social policy and economic initiatives. The ultimate objective of social development is to bring about sustained improvement in the well-being of the individual, groups, family, community, and society at large. It involves sustained increase in the economic standard of living of a country's population, normally accomplished by increasing its stocks of physical and human capital and thus improving its technology.

It is widely believed that the socio-economic development of a nation is a function of her level of education which is itself a function of the nature of her curriculum implemented in schools. This could be the main reason why developed countries of the world achieved their eminence by hard work. Japan, which is one of the leading countries in the production of electronics and automobiles, attached a lot of importance to education sector (Cambell, 2011). The basic focus of education is to serve as a veritable tool for preparing young generation to live a productive adult life in the contemporary society. The contemporary society is fast changing and one major factor of change is the combined influence of science and technology, particularly, Information and Communication Technology (ICT), (Seweje, 2010).

The product of science and technology has contributed significantly to the development of a nation. Through the application of science, scientific knowledgeable professionals have been able to invent equipment and machines used in

industries and homes. In addition to this, science and technology has helped in ease stress brought by the movement of goods and services from one place to another, by inventing easy transportation equipment like automobiles, aircrafts among others. Furthermore, science and technology has helped in the area of medicine, communication, food production, electricity, good road and lots more. It is incontrovertible to say that science and technology play important roles in the development of any nation.

Nigeria's philosophy of education is based on the belief that education is adopted as an instrument for national development and social change and the education maximises the creative potentials and skills of the individual for self – fulfilment and general development of the society. To this end, the formulation of ideas, their integration for national development, and the interaction of persons and ideas are all aspects of education (Federal Republic of Nigeria, 2013).

Science education deals with sharing of science content and process with individuals who are not considered traditionally to be members of the scientific community. Science education in Nigeria concentrates on the teaching of science concepts, method of teaching, and addressing misconceptions held by learners regarding science concepts (Aina, 2013). Science Education is one of the foundation upon which the bulk of present day technological breakthrough is built. Without science education, developments in science and technology as well as advances in information communication and technology would have not been possible.

In Nigeria senior secondary schools, core science subjects typically taught include Chemistry, Biology and Physics, along with Mathematics. These are often considered foundational for science-related fields. Other science-related subjects may include Agricultural Science, Further Mathematics and Computer Studies or Data Processing.

Science education is the only way to achieve scientific literacy and it is essential for a country to remain technologically and scientifically viable. The importance of students learning scientific principles, facts, values, and norms through science classes cannot be underestimated as understanding physical and natural resources in their environment and developing skills for their best use are made possible by scientific knowledge. This is laying credence to the fact that understanding natural phenomena and using

scientific reasoning is beneficial (Okewande, 2021).

Science educators in recent years gave attention on how to improve science instruction and teaching in schools by going beyond the stereotypic methods of obtaining knowledge in science.

Science has become such an indispensable tool that no nation, developed or developing, wishing to progress in socio-economic society will afford to relegate the learning of science in school (Feynman, 2011). Science education could enable learners to acquire problem solving and decision-making skills that pave way for critical thinking and inquiry that could help them to respond to widespread and radical changes in all facets of life.

The National Policy on Education lists the following five primary national objectives as the type of country Nigeria aspires to be a society that is free and democratic, just and egalitarian; a nation that is united, strong and self-sufficient, an economy that is great and dynamic, and a land where all citizens have access to a variety of opportunities (FRN, 2004).

The quest to educate students technologically motivate the inclusion of science courses at all secondary school levels in Nigeria with the mind that the Federal Government of Nigeria wants to:

- diversify curriculum to cater for its difference in talents, opportunities and future roles that would be opened to students after their secondary school courses,
- provide trained personnel in applied science and technology,
- equip students to live effectively in the modern age of science and technology,
- raise a generation of people who can think for themselves, respect the dignity of labor and appreciate those value specified under our broad aims and live as good citizens.
- provide technical knowledge and vocational skills necessary for agriculture, industrial, commercial and economic development (FRN, 2009).

The acquisition of scientific skills and application of the skills into solving the societal problems in order make the society to be more reliant could be evaluated through Students' competency of the scientific skills.

Competency refers to the ability to successfully and efficiently accomplish a task or role, encompassing a combination of skills, knowledge, and behaviors. It's essentially a measure of how well someone can apply their

capabilities to achieve desired outcomes in a specific context, like a job or a project. Competencies are often used to define job requirements, assess performance, and guide training initiatives.

Science students' competency refers to the overall ability and authority of students in employing their scientific knowledge for the purpose of solving their problems in the society which could lead to socio-economic advancement. It refers to the essential knowledge, skills, and abilities that students must possess in order to effectively navigate various national and personal situations. This competence is crucial for students' success in educational settings and application of the skills in the society (Selvi, 2010).

Earlier researcher have suggested that gender can influence students' competency in specific areas, but these differences are not consistent always which could be influenced by various factors such as subject matter, teaching methods, and social context. While some studies indicate that males usually outperform females in science inquiry and its application to solve problems in the society.

According to Akeju, Rotimi, & Kenni (2011), gender plays significant role in the scientific performance of students in some science subjects such as Biology and Physics. Ajaja (2013) holds a contrary opinion that in Nigeria, certain scientific vocations and professions such as medicine, engineering and architecture have traditionally been attached to male while nursing has been attached to females. Due to the foregoing, the researcher investigated science students' competency and gender as determinants of socio-economic development in South West, Nigeria

Delimitation of the Study

The study was delimited to science students' competency and gender as determinants of socio-economic development in South West, Nigeria. It was also delimited to secondary school students II students in South West, Nigeria.

Research Questions

One research question was raised in the course of this study:

1. What is the level of science students' competency in South West?

Research Hypotheses

The following research hypotheses were postulated;

1. Science students' competency will not significantly influence socio-economic development in South-West, Nigeria
2. There is no significantly difference in socio-economic development in South-West, Nigeria based on student's gender.

Research Design

The study employed descriptive research design of the survey type. It was adopted as it involves the collection of facts extensively from science students' competency for the purpose of interpreting its influence on the existing situation on socio-economic development in South West, Nigeria

Population

The population of this research work consisted of all Senior Secondary School II science students in South West, Nigeria

Sample and Sampling Technique

The sample for this study consists one thousand three hundred and fifty (1,350) Secondary School II science students in South West, through random sampling technique. The sample was selected through multistage sampling procedure.

In stage one, four states which were Osun, Ekiti, Ogun, Kwara and Lagos States were selected out of six states through simple random sampling technique. The second stage involved the selection of five Secondary Schools from each state selected through purposive sampling technique putting into consideration, schools that contains boys and girls. In stage three, intact class of the selected schools were used for the study.

Research Instrument

The instrument used in this research work was a questionnaire tagged 'Science Students' Competency as Determinants of Socio-Economic Development (SSCDSSED). The questionnaire consists of 25 self-report items to elicit specific information on Science Students' Competency as Determinants of Socio-Economic Development.

Validity of the instrument

Face and content validity of the instrument were ensured. The instrument was validated by experts in Economics, Science Education and Test, Measurement and Evaluation. All their corrections were properly incorporated into the instrument before use.

Reliability of the Instrument

The method of test-retest was used to establish the reliability of the instrument. The instrument was administered to thirty computer science students in Osun State twice within the period of two weeks. Pearson Product Moment Correlation analysis was used for the data collected and the reliability coefficient of 0.88 was obtained thereby making the instrument reliable. This proves the consistency of the instrument

Data collected were analyzed appropriately; the research question was answered with percentage, hypotheses one and two were analysed using Simple Linear Regression Analysis and t-test analysis at the significance level of 0.05.

II. RESULT AND DISCUSSION

Research Question 1: What is the level of influence socio-economic development in South-West, Nigeria?

Data Analysis

Table 1: The Level of Prevalence of influence socio-economic development in South-West, Nigeria

Prevalence of drug abuse	Frequency	Percentage
Low (48.00-49.00)	81	6.0
Moderate(49.01-97.89)	1260	93.3
High(97.90-147.00)	9	.7
Total	1350	100.0

The result in Table 1 shows that out of 1350 students sampled, 81, representing 6 percent indicated low level of influence socio-economic development in South-West, Nigeria. Those who indicated moderate level were 1260 representing 93.3 percent while those who reported high level of

influence socio-economic development in South-West, Nigeria were 9 representing 0.7 percent. This shows that the level of socio-economic development in South-West, Nigeria was moderate. This is further depicted in Figure 1.

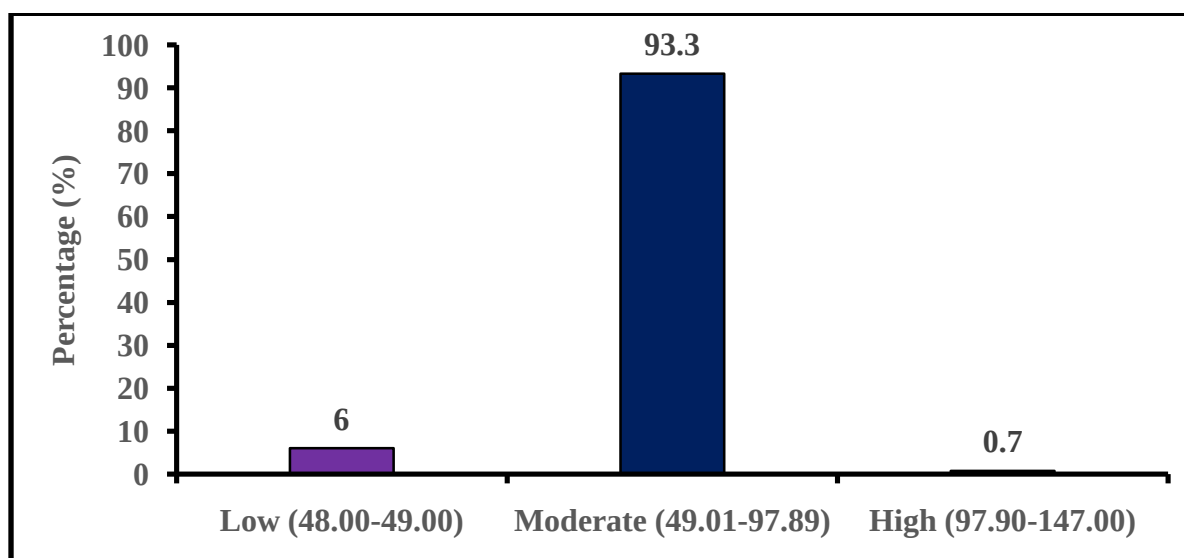


Figure 4: Bar Chart showing the level of influence socio-economic development in South-West, Nigeria

Hypotheses Testing

Hypothesis 1: Science students' competency will not significantly influence socio-economic development in South-West, Nigeria

In order to test the hypothesis, scores relating to science students' competency and socio-economic

development were computed and subjected to statistical analysis involving Simple Linear Regression statistics at 0.05 level of significance. The result is presented in Table 2

Table 2: Simple Linear Regression Analysis of science students' competency and socio-economic development

Model	Unstandardized Coefficients		Standardized Coefficients	t	P
	B	Std. Error	Beta (β)		
(Constant)	101.304	2.077		48.783	.000
Stress	-1.675	.120	-.355	-13.956	.000
Multiple R=0.355, Multiple R ² = 0.126, Adjusted R ² =0.126, F _{1,1348} =194.779					

*p<0.05

The following regression can be derived from Table 2.

$$Y = a + b_1X_1$$

Where

X₁ = Science Students' Competency

b_i = (i=1) Regression Weight Coefficients

a = Constant (other variables other than X₁)

The multiple regression showing the relationship between the dependent and independent variables can, therefore, be given as follow:

$$Y = 101.304 - 1.675X_1$$

Table 2 shows that science students' competency will significantly influence socio-economic development in South-West, Nigeria (F_{1,1348}=194.779*, p<0.05). The null hypothesis is rejected. The table reveals that there is low but significant positive as well as multiple correlation between the predictor variable (science students' competency) and socio-economic development in South-West, Nigeria (R=0.355, p<0.05). This implies that the predictor variable is a factor (science students' competency) that can exert

influence on socio-economic development in South-West, Nigeria. The value of the coefficient of determination (R²=0.126) indicates that the predictor variable accounted for 12.6% of the total variance of socio-economic development in South-West, Nigeria while the remaining 87.4 unexplained variation is largely due to other variable that can account for socio-economic development in South-West, Nigeria. The calculated F-ratio (194.779) was significant at 0.05 level of significance. This implies that the predictor variable (science students' competency) provides a significant explanation for the variation in the level of socio-economic development in South-West, Nigeria.

Hypothesis 2: There is no significantly difference in socio-economic development in South-West, Nigeria based on student's gender.

In order to test the hypothesis, mean scores on socio-economic development in South-West, Nigeria based on student's gender were computed and compared for statistical significance using t-test statistics at 0.05 level of significance. The result is presented below.

Table 3: t-test Showing socio-economic development in South-West, Nigeria based on student's gender

Group	N	Mean	SD	Df	t	P
Female	9	71.00	1.50	1348	0.434	.664
Male	1341	72.60	11.04			

*p<0.05;

Table 3 shows that the computed t-value (0.434) with a p-value >0.05 was not significant at 0.05 level for the groups. The null hypothesis was not rejected. This shows that there is no significant

difference in the socio-economic development in South-West, Nigeria based on student's gender.

Discussion

The result showed this shows that the level of influence socio-economic development in South-West, Nigeria was moderate. This might be as a result of herdsmen which recently started turning back to their customary seasonal grazing patterns which has led to crisis. Rising unemployment among youths which is evident in the faces of every youth could have resulted to this finding. The finding is in agreement with Popoola, Brimah and Shittu (2020) that the level of socio-economic development observed in South West Nigeria is unencouraged which has affected people's entrepreneurial behaviour and economic activities.

Finding of this study showed that science students' competency significantly influence the level of socio-economic development in South-West, Nigeria. This might be as a result of importance of science and technology in the development of socio-economy of a nation. This finding is in agreement with that of Adekoya & Abdul Razak (2021) who stated that effective application of scientific knowledge to solve societal problems is based on science students' competency.

The result of this study showed that there is no significant difference in socio-economic development in South-West, Nigeria based on student's gender. This may have occurred due to the fact that both genders are involved in science and technology in respective to any area of specialization in science education in Nigeria. This study is not in consonance with the submission of Aina, (2013) that in the South West of Nigeria, gender inequality significantly impacts socio-economic development, with women often facing disadvantages in education, healthcare, economic opportunities, and political representation. This inequality leads to macroeconomic losses and hinders overall growth and development.

III. CONCLUSION

Based on the findings of this study, it is therefore concluded that the level of influence socio-economic development in South-West, Nigeria is moderate. Also that science students' competency is a determinant for the level of socio-economic development. The level of socio-economic development in South-West, Nigeria is not gender bias.

RECOMMENDATIONS

The following recommendations were made.

Adequate and relevant learning materials should be provided for the students in order to facilitate their learning. Conducive home environment should be provided for the children to enhance and improve their academic performance. The parents should not devote all their time for work; they should also find time for their children. Finally, parents should create time to assist their children at home to develop study habits.

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