

*Full Length Research Paper*

# The Impact of Entrepreneurship Education on Science Students in Senior Secondary Schools in Rivers State

Nduudee, Joy Nenalebari<sup>\*1</sup> and Shedrack, Tamunoiyowuna<sup>2</sup>

<sup>1</sup>Department of Chemistry, Ignatius Ajuru University of Education Rumuolumeni, P.M.B. 5047, Port Harcourt, Rivers State, Nigeria.

<sup>2</sup>Department of Physics, Ignatius Ajuru University of Education Rumoulumeni, P.M.B. 5047, Port Harcourt, Rivers State, Nigeria.

Received: 29 March, 2021, Accepted: 14 April, 2021, Published: 29 April, 2021

The study investigated the impact of entrepreneurship on senior secondary school students in Rivers state. A quasi-experimental design was adopted of the type pre-test post-test control group. The study was conducted in Obio/Akpor local government area of Rivers State. The population the study comprised of all senior secondary class two (SSII) who offered Chemistry in the six public co-educational secondary schools in Obio/Akpor local government area of Rivers state. A total population of one thousand one hundred students. Purposive sampling technique was used to select two public schools and was randomly assigned to the experimental and control groups. 200 students were involved in the study with 100 students in the experimental and 100 in the control intact group. Two research questions and two hypotheses guided the study. Twenty (20) multiple choice test questions having sections A and B were constructed on saponification by the researcher. The instrument had a reliability coefficient of  $r=0.88$  using a test- retest method of estimating reliability. The data obtained were analyzed using mean and standard deviation for the research questions and ANCOVA were used for the hypotheses which were tested at 0.05 level of significance. Base on the findings it was recommended that science teachers with entrepreneurial skills be recruited and adequately funded by the government to promote entrepreneurship education.

**Keywords:** Impact, entrepreneurship, education, students, senior secondary

## INTRODUCTION

The prevalence of unemployment in Nigeria remains a great challenge confronting the government and the people; this has been so alarming for decades. It is indeed saddening to observe that graduates are produced every year but remain unemployed. There is need for science students to develop entrepreneurial skills which is a way of reducing unemployment and becoming self-reliant thereby eradicating poverty. These skills can only be developed through efficient and effective knowledge of science education. According to the National Bureau of statistics (Emeh 2012) 55.4% of the Nigerian youth were jobless by the third quarter of 2018 as against 52.6 of 2017. It is not helpful for the economic growth of the

country. The introduction of National Directorate of employment and National poverty Eradication programmed (Surajo & Karim 2016) The Global Development Goals (SDGs) is a global goal designed to be a blueprint to achieve a better and more sustainable future for all. The SDGs were set in 2015 by the United Nations General Assembly with these goals No poverty, Zero hunger, Good health and well-being, Quality education, Gender equality, clean water and sanitation, Decent work and economic growth etc. The Millennium Development Goals (MDGs) had a global plan to reduce the main indicators of poverty by the year 2015. These goals are to eradicate extreme poverty and hunger, achieve universal primary education promote gender equality and empowerment of women, reduce child mortality, improve maternal health and subdue various diseases and ensure environment sustainability

\*Corresponding author's e-mail: [joywereneedu@gmail.com](mailto:joywereneedu@gmail.com).

and develop a global partnership for development. In another related study titled strategies for promoting entrepreneurial skills in science education students for poverty eradication, Agommuoh and Ndirika (2017) said that the rate of unemployment in Nigeria is alarming.

Abimbola (2013) defined science as a branch of knowledge that deals with the body of facts or truth, systematically arranged and showing the operation of general laws. Chemistry as one of the main branch of science deals with the composition, properties and uses of matter which lobs into the principles governing the changes that matter undergoes (Ababio, 2016). Chemistry as a science subject entails the utilization of natural things and the manufacture of artificial ones, therefore it is not an understatement that everything we come by, hear, observe, taste, touch and smell comprises of Chemistry and chemical in our body (Bagley 2014) chemistry contributes to quality of life and nation building in all aspects of science as noted by Festus & Ekpete (2012) in Ogbe & Omenka (2019). Physics education is a conveyor of science and technology on which the national economic transformation hinges (Agommuoh & Akanwa, 2014). From the foregoing, it is no longer an argument that the attainment of scientific and technological advancement which combats poverty depends on science education of all citizens (Udogu & Nnoli, 2017). It is therefore imperative that science be taught in such a way that students will inculcate the skill of self-reliant by teaching and laying more emphasis on the practical aspect of the subject by this the students can acquire entrepreneurship skills which can make them self-reliant even if they do not proceed to the tertiary institutions (Ogbe & Omenka, 2019). Entrepreneurship is universal concepts generally accepted as a phenomenon or to wipe away the view of graduate dependency on the white collar job as the only source of employment in our nation and the world as a whole. Entrepreneurial skill acquisition in Nigeria entails focusing on what should be done to bridge the gap between the school and labor market, where the learner will work after graduation so as to be self-reliant in the society (Mbanefo & Eboka 2017). Mbanefo and Eboka, view entrepreneurship as the act of identifying initiating, organizing and bring an idea or vision to life, be it a new product, service process strategy or market. Entrepreneurship is all about self-employment which is very important for improving an individual's quality of life and national development. Finally saponification is the process in which triglycerides are combined with a strong base to form fatty acid metal salts during the soap-making process fatty acid are derived primarily from vegetable or plant oils use as soap feedstock and contains natural fragrances. The process of soap making can be demonstrated as Ester+Base\_\_Alcohol+soap. Saponification is used by wet chemical fire extinguishers to convert burning fats and oils into non-combustible soap which helps in extinguishing fire. Soaps formed are used in everyday life

like laundry, cleaning, lubricating greases. Bernecke & Maruska (2012). Several researchers who investigated on entrepreneurship and science education in relation to self-development and employment as reported in literature include Brown and Adiele (2010), Oboral and Omogbolam (2015) who in their separate but similar works found out that entrepreneurship education, if well implemented, is very vital for national economic development. Morris, Anyadike and Covin (2012) investigated on entrepreneurship development and employment generation in Nigeria problem and prospects and found out that the challenges and obstacles facing aspiring Nigerian entrepreneurs are constrained access to local and international markets, stunt entrepreneurial expansion and proliferation, sever infrastructure deceits (power and electricity) that hamstring both new and existing business.

Adiele and Brown (2010) investigated on Chemistry for entrepreneurship education level in Akwalbom State, Nigeria. The study shows that entrepreneurship education was not given adequate attention in the curriculum of many educational institutions in the country. It also revealed that the facilities and qualified teachers, instructors for teaching of entrepreneurship education are in short supply in both public and private secondary schools. It further revealed that entrepreneurship education promotes and fosters entrepreneurial cultures and mindset, skills acquisition, self-employment, economic independence and self-actualization necessary for sustainable entrepreneurial development and poverty alleviation. Other research work in support of entrepreneurship education is that of Oborah, Araba, and Omobolahan (2012).

Entrepreneurial skills in Chemistry contents include production of dyes from knowledge of color Chemistry, production of local drugs from knowledge of medical Chemistry treatment of water from knowledge of environmental hydro Chemistry among others Jack (2012). Chemistry is a science subject comprising of some practical topics which can be converted to finish products ready for consumption which in otherwise promote entrepreneurial spirit of graduating students and finally leads to self-dependences. The National Bureau of statistics (2014), revealed that unemployment rate in Nigeria in the first quarter of 2013 was 23.9%. The rate of unemployment in Nigeria is indeed alarming and is of concerned to all stakeholders in the educational sector. Hence it is against this background that the researcher looked at the impact of entrepreneurship education on science students in senior secondary school in Rivers state. To resolve this research problem the following research questions were posed and answered in this study.

(1).What difference exist between students taught saponification concept as an example of entrepreneurship in science education and those not

**Table 1:** Illustration of pre-test post-test Quasi-experimental design.

Group	Pretest	Treatment	Post-test
Experimental	Q1	X <sub>1</sub>	Q2
Control	Q3	X <sub>2</sub>	Q4

taught saponification concept as an example of entrepreneurship in science education.

(2).Does gender has any impact on students taught saponification concept as an-example of entrepreneurship in science education. To answer the research questions the following null hypotheses were formulated as tentative answer to the research questions and further tested at 0.05 level of significance.

i. There is no significant difference in the mean scores between students taught saponification as an example of entrepreneurship and science education and those that were not taught saponification concept as an example of entrepreneurship in science education.

ii.) .Gender is not a significant factor influencing students taught saponification concept as an example of entrepreneurship and science education.

**METHODOLOGY**

This study adopted the pre-test, post-test control group quasi-experimental design. An illustration of the design is presented on table 1.

Where Q1 and Q3 = pretest scores.

Q2 and Q4 = post-test scores,

X<sub>1</sub> = demonstration method

X<sub>2</sub> = Discussion method

The study is a quasi-experimental research of the type pre-test post-test control group design. The study was conducted in Obio/Akpor Local Government Area of Rivers state. The population of the study comprised of all senior secondary class two (SSII) students who offered Chemistry in the six public co-educational secondary school in Obio/Akpor Government Area of Rivers State with a total of one thousand one hundred (1100) students. A purposive sampling technique was used to select two public secondary schools in Obio/Akpor and was randomly assigned as experimental and control groups. The class assigned to the experimental group has 100 students while the control group has 100 students in their intact classes. Hence, 200 students constituted the sample size of the study. The instrument for the study was constructed by the researcher and validated by experts in science education, named Chemistry Achievement Test (CAT) based on the content of instruction for SSII. The instruments consisted of a twenty (20) multiple choice objective test items with options A to D. The reliability coefficient of the instrument

was 0.88, established through test-retest method of estimating reliability as a measure of its stability over time. The pretest-CAT was administered to the samples in their intact classes in the selected schools to establish the equivalences of the subjects for the study. After the treatment for two weeks the students were subjected to the same test as post test though the test items were renumbered (Re-shuffle). That is the post-test contains the same questions only the items were reshuffled in numbering. The Chemistry teacher of the sample schools were trained and properly guided to serve as research assistants. The data collected were analyzed using mean and standard deviation for the research questions and analysis of covariance (ANCOVA) for the hypotheses.

**RESULTS**

**Research question 1:** What differences exist between students taught saponification concept as an example of entrepreneurship in science education and those not taught saponification concept as an example of entrepreneurship in science education?

**Hypothesis I:** There is no significant difference in the mean score between student taught saponification as an example of entrepreneurship in science education and those that were not taught saponification concept as an example of entrepreneurship in science education.

From table 2 below, it is shown that the  $\bar{x}$  value of the experimental group was 17.80 and the standard deviation (SD) was 1.747 while that of the control group were 14.68 and 1.948 respectively. After carrying out the ANCOVA analysis, the F value was found to be 118.331 which was significance. Therefore, the null hypothesis is hereby rejected. The result shows that there is a significant different between those taught saponification as an example of entrepreneurship in science education and those not taught saponification as an example of entrepreneurship in science education.

**Research question 2:** Does gender have any impact on students taught saponification as an example of entrepreneurship in science education.

**Hypothesis II:** Gender is not a significant factor influencing students taught saponification concept as an example of entrepreneurship in science education.

From table 3 below, it is shown that the  $\bar{x}$  value for male was 17.82 while that of the female was 17.78 and their standard deviation (SD) were both 1.711 and 1.799 respectively, after performing the ANCONA analysis, the F value was 0.005 which was not significant at 0.05 level

**Table 2:** ANCOVA analysis of the difference between the experimental group and the control group

Group	N	$\bar{X}$	SD
Experimental	100	17.80	1.747
Control	100	14.68	1.948

  

SV	SS	df	Ms	F	Sig	Decision
Protest score	38.538	1	38.538	11.877		
main effect score	383.958	1	383.958	118.331		
Residual error	639.222	197	3.245			
Total	1061.718	199			000	Significance
Significant						

\*significant,  $P(000) < 0.05$  level of significance.

**Table 3:** ANCOVA analysis of the difference between male and female in the experimental group

Group	N	$\bar{X}$	SD
Male	50	17.82	1.711
Female	50	17.78	1.799

  

SV	SS	df	Ms	F	Sig	Decision
Protest score	15.072	1	15.072	5.096		
main effect score	.016	1	016	.005		NS
Residual error	286.888	97	2.958		.941	
Total	317.96					

\*NS=Not significant,  $P(941) > 0.05$  level of significance.

of significance. Therefore, the null hypothesis is hereby accepted. The result shows that there is no significant difference in the mean score between students taught saponification concept as an example of entrepreneurship in science education and those that were not taught saponification as an example of entrepreneurship in science education.

## DISCUSSION

The study investigated the impact of entrepreneurship on science education in secondary school students in Rivers State. The null hypotheses  $H_0$ , which states that there is no significant difference in the mean score between students taught saponification as an example of entrepreneurship in science education and those that were not taught saponification concept as an example of entrepreneurship in science education, was rejected. This implies that students taught saponification concept as an example of entrepreneurship education perform better than those not taught saponification concept as an example of entrepreneurship in science education. This result is in agreement with the findings of Adiele and Brown (2010) who said that there is indeed a significant difference between students who were exposed to entrepreneurship and those not exposed to entrepreneurship, but disagree with the results obtained by Morris, Anydike, and covin (2012) whose findings indicated that the obstacles facing aspiring Nigerian

entrepreneurs are constrained access to local and international market. The introduction of entrepreneurship in science education has numerous positive impacts in Chemistry, Physics, Biology because entrepreneurship education promotes skill acquisition, self-employment economic independence, self-actualization and alleviation.

## RECOMMENDATIONS

- 1). Adequate and experienced quality manpower (teachers) with entrepreneurial skills should be recruited to teach entrepreneurship or vocational subjects in secondary school.
- 2). Secondly, teachers should be trained for the challenge of entrepreneurship in science education to ensure the success of the program in secondary schools as this will expose them to modern trends in entrepreneurship across the globe.
- (3). A directorate or committee for entrepreneurship education should be established in secondary school to ensure consistent and effective monitoring and supervision of the program. This will ensure good management and check mismanagement of fund and facilities meant for the program.

## REFERENCES

Ababio, O.Y. (2016). New School Chemistry for Secondary Schools .9<sup>th</sup>

- Edition. Onisha: Africana First Publisher.
- Abimbola, I. O. (2013). Philosophy of science for degree students. Ilroin Bamitex printing & publishing.
- Adiele, E.E. & Brown, D. (2010). Entrepreneurship education: A strategy for achieving self-reliance and economic development. *J. Manage. and Enterprise Develop.* 7(4): 35-46.
- Agommuoh, P.C & Akanwa, U. N. (2014). Senior Secondary School Physics Teachers Assessment of Entrepreneurial Skills Needed for Global competitiveness. *IOSR J. Res. & Method in Educ.* 4(1): 25-29.
- Agommuoh, P.C. & Ndirika, M.C. (2017). Strategies of Promoting Entrepreneurial Skills in Science Education Students for Poverty Eradication. *IOSR J. Res. & Method in Educ.* 7(3): 45-49.
- Araba, S.O. (2012). Entrepreneurial Education as a tool for reducing unemployment in Nigeria. Retrieved June 14 2018 from <http://www.academic.edu/2047944>.
- Bernecke, S. & Maruska, A. (2013). Analysis of free fatty acids in soap samples by means of gas chromatography mass spectrometry. *Chemija*, 2(4): 307-311.
- Emeh I.E.J. (2012). Tackling Youth Unemployment in Nigeria, the Lagos State Development Programmes Initiatives. *Afro Asian J. Soc. Sci.* 3(3,4): 2229-2239.
- Festus, C. & Ekpete, O. A. (2012). Improving students' performance and attitudes towards Chemistry through problem based-solving techniques. *Int. J. Acad. Res. in Progressive Educ. and Develop.* 1(1).
- Jack, R. (2012). British board of film classification November 13, 2012, retrieved November 13, 2012.
- Jack, S. (2014). Lancaster University Lu Department for Entrepreneurship strategy and innovation.
- Mbanefo, C. M. & Eboka, C. O. (2017). Acquisition of Innovative and Entrepreneurial Skills in Basic Science Education for Job Creation in Nigeria. *Sci. Educ. Int.* 28(3): 207-213.
- Morris, M.H., Anyadike, E.U. & Covin, J.G. (2008). Corporate entrepreneurship and innovation: Entrepreneurial development within organizations. Ibadan Macmillan.
- Oborah, J.O., Araba, S. & Omogboham, I.M. (2015). The state of Entrepreneurship education in the United States: A nationwide survey and analysis. *Int. J. Entrepreneurship Educ.* 2(1): 15-30.
- Ogbe, A.O. & Omenka, J.E. (2019). Science and Mathematics Education as tools for Developing Entrepreneurship Skills among Secondary School Students in Cross River state, Nigeria. *Glob. J. Educ. Res.* 18: 35-45.
- Surajo, A.Z. & Karim, A.H.Z. (2016). Youth Unemployment and poverty in Nigeria a thread to sustainable growth and Development. *Int. J. Sci. Res. and Manage.* (IJSRM), 4(11): 4919-4928.
- Yusuf, S.D. & Omolayo, N.L. (2010). Science teachers education in Nigeria: Challenges and strategies for quality Education, Isah Kaifa College of Education Dutsin-Ma, 1(1): 31-39.
- United Nations (2017) Resolution adopted by the General Assembly on 6 July 2017.