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Level of Preparedness and Challenges of Chemistry Students to Acquire Entrepreneurial Skills Via Local Material

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ABSTRACT

This work accessed level of preparedness and challenges towards developing entrepreneurial skills in chemistry students using local resource materials. Three research questions guided the work. The research was carried out in six education zones of Anambra State. Four hundred and five (405) science teachers drawn from forty-five (45) secondary schools out of two hundred and fifty eight (258) public schools in the state formed the sample for the study. Twenty-six (26) item structured questionnaires on a four point rating scale format developed by the researchers were used for data collection. After the administration of the instrument to the respondents, the data obtained were analyzed using means and standard deviation. The results obtained showed that majority of chemistry students agree to acquire appropriate knowledge and skills on entrepreneurial education via the prescribed strategies. They agreed on the strategies suggested and also that the challenges proffered are likely to hinder the exercise. Recommendations were made based on the findings.

Keywords: Challenges, prepadness, chemistry, entrepreneurial and skill.

INTRODUCTION

Every nation of the world is endowed with one natural resources or the other, like mineral, water and human resources. The contribution of these to the national growth and development depends on the training received by human resources to put the other resources into effective use. This depends on the abundance of technical potential that is based on scientific advances [1].

Attainment of scientific and technological advancement is dependent on the science education of all citizens. Science education is expected to produce informed citizens' men and women of quality equipped with appropriate knowledge, useful talents, high technical skills groomed with practical dexterity to use their hands, heads and hearts to introduce and operate new productive processes for employment generation and self-reliance [2]. [3], pointed out that chemistry education and its application (technology) to real life problem is one of the most powerful instruments for enabling all members of the society to face these new challenges. Hence [4], saw chemistry education as an intellectual search involving inquiry for scientific explanations which is necessary for the current race for technological

and industrial development. In the same vain [5] describe chemistry education as a process of teaching and or training especially in schools to improve one's knowledge about one's environment and to develop one's skill for systematic inquiry. In some developed countries like England, United States of America and Japan, entrepreneurial skill acquisition is an important part of their school-to-work programme for all chemistry students. The programme apart from enabling chemistry students to acquire appropriate entrepreneurial skill also helps students in their transition from their education experience to employment [6].

In Nigeria, like in most developing countries, the level of acquisition of entrepreneurial skills is quite low. The major factor inhibiting skill acquisition by science students in secondary school is that the type of education given to them is purely "academic education" or literal education which prepares its recipients for white collar jobs or paid employment. This type of education is certificate conscious and places much emphasis on knowledge of content and passing of prescribed examination while skills acquisition is de-emphasized. Thus, employment into the work-force is based on certificates obtained and not on what the individual can be or the skill he or she possess. In other words, the education system prepares its graduate mainly for "white collar jobs or paid employment [2]. The result is that the graduates from Nigeria education system are not equipped with appropriate skills and competencies necessary for self-employment and self-reliance. The challenge facing Nigeria today is how to develop entrepreneurial skills in students through effective teaching and learning of chemistry subject in secondary schools. According to [5] entrepreneurship is the willingness to seek out investment opportunities in an environment and be able to establish and run an enterprise successfully based on the identified opportunities. Also entrepreneurial skills are in-built capabilities or tools that enable an entrepreneur to carry out an entrepreneurial task. An entrepreneur possesses the following attributes: self-discipline, self-nurturing; highly energetic, tolerance of uncertainty, innovativeness, action-oriented and ability to improvise. Teaching of chemistry for skill acquisition therefore, must be directed towards the use of local materials and the materials must be those obtained from the learner's environment. This is why [8], posited that the best way to help the students to achieve in-built skills is to teach them with local materials which they are familiar with within the localities.

Table 1: Some Chemistry Concept and their Related Local Materials

Contents	Local Materials
Separation technique sieving	"Nzu, sand, chalk, stone, garri, rice, akidi, common salt, fruit juice, akamu
Separation funnel	Palm oil, local gin, (kai-kai) water, groundnut oil, vegetable oil, kerosene
Acid, base and salt	Ethnic and vinegar lactic acid-lime, lemon, arrino adds, proteins fatty acid.
Salt	Manishanu cow milk, vegetable oil, palm, ascorbic-organs.
Base	Banana-back - potassium hydroxide, plantain peels - potassium hydroxide, palm ash (Ugu) potassium hydroxide. Paw-paw (leaf, Root and stem) sodium hydroxide
Soap making	Animal fats (mutton vegetable oils, palm oil, coconut or olive oil, any of the base above
Alcohol organic fertilizer air pollution.	Children, pigs, goats etc sand, dust, pollen grain, sand drums, smoke, fumes, from chimney of industries etc.

Problem of the Study

Many graduates from secondary school education system are unemployed because they do not possess appropriate skills needed by the employees. Furthermore, most of these graduates do not possess entrepreneurial skills that will enable them establish and manage a small business enterprise so as to become self-employed and self-reliant on graduation. There is need to find a way of making science education in Nigeria more functional and meaningful to both youths and society at large. One of the best ways to achieve this is to inculcate science entrepreneurial skills in chemistry students using local resource materials. The problem then is to ascertain how prepared the chemistry teachers in secondary school are to inculcate these skills in students, to suggest possible way to inculcate these skills in them and finally identify likely challenges to this task. Therefore, this work sought to ascertain the following:

1. Chemistry students' preparedness to develop entrepreneurial skills through science education using local materials.
2. Ascertain strategies for achieving the inculcation of entrepreneurial skills in –chemistry students using local resource materials.
3. The possible challenges to the development of entrepreneurial skills through chemistry education using local materials.

METHOD

A descriptive survey design was used for the study. The study was carried out in secondary schools in six education zones in Anambra State. The sample consists of 405 chemistry students drawn from 45 out of 258 public secondary schools in Anambra State. The population comprised of all chemistry education students (numbering 1,826 teachers) in 258 public secondary schools Anambra State. From each of the six education zones in Anambra State, 8 public secondary schools were drawn by simple random sampling with replacement, except in Otuocha zone from which 5 public secondary schools were selected because Otuocha zone has fewest secondary schools. In each of the 45 secondary schools, nine chemistry teachers were randomly selected for the study. Thus 405 chemistry teachers drawn from 45 public secondary schools in the six education zones in Anambra State of Nigeria participated in the study.

INSTRUMENT FOR DATA COLLECTION

This instrument for data collection was 26 items in structured questionnaire on a-4 point scale of (strongly agreed, agreed, disagreed and strongly disagreed) developed by the researcher. The questionnaire has two sections:. Section A sought information on the bio-data of the respondents. Section B sought information on the preparedness, strategy and challenges to the development of entrepreneurial skills in students and is validated by two chemistry educators and two experts in measurement and evaluation from University of Nigeria; Nsukka. The comments and suggestion of the experts were incorporated in building up the final draft. Instruments were trial-tested on fifty science teachers drawn from secondary school that were not involved from the main study. The result was used to determine the reliability of the instrument using Cronbach Alpha techniques. The reliability index 0.87 was estimated, the questionnaires were administered to the respondents by the two researchers during which 100 return was made. The research question was answered using mean and standard deviation. A mean of 2.50 and above indicated that the respondents agreed with the question item, while a mean of 2,49 and below indicated that the respondents disagreed with the questionnaire.

Table 2: Mean Rating Scores and Standard Deviation of Chemistry students Perception on their preparedness and strategies for Developing Entrepreneurial skills in them

S/No	Questionnaire Items	Mean (x)	SD	Decision
1	Use local materials to make chemistry concept more concrete and real	2.69	0.72	Agreed
2	Combine perfectly different pedagogical method both in practicals and theories	2.87	0.82	Agreed
3	Linking chemistry concept teaching to your day-to-day activities at home.	3.10	0.91	Agreed
4	Integrating theory with practical during teaching	2.90	0.85	Agreed
5	Move to industrial attachment for you to learn skills involved in the production of some chemicals.	3.29	0.83	Agreed
6	Students go to local industries to learn how to produce some food items (eg. Garri)	3.01	0.89	Agreed
7	Carryout home projects requiring skills	2.96	0.53	Agreed
8	Learn skills involved in the consumer goods production using local materials	2.65	0.75	Agreed
9	Students contribute money to learn skills from resource persons from outside school setting.	3.47	1.21	Agreed
10	Students always practicalize their science lessons using the few available materials.	3.47	1.21	Agreed
11	Involving yourselves in the preparation of materials for lesson practical.	3.56	1 54	Agreed
12	Carryout project work that can enable leaner-acquire relevant skills.	3.56	1.54	Agreed
13	Read pamphlets that carry information on the skills and methods of production of consumer goods or production e.g. dettol, soap etc.	2.98	0.84	Agreed
	Grand mean	**3.27**	**0.63**	**Agreed**

Table above shows that chemistry students are in agreement that development of entrepreneurial skills in students through the following instructional practices are powerful strategies and are prepared to adhere to the strategies.

Table 3: Mean Rating Scores and Standard Deviation of students' Perception on Challenges of Developing Entrepreneurial Skills in them

S/No	Questionnaire Kerns	Mean (x]	SO	Decision
1	Poor pay package for our parents	3.57		Agreed
2	Most chemistry students are in poor knowledge of some of these local materials	2.82		Agreed
3	Insufficient time for teachers to engage us in the use of these local materials.	3.10	1.76	Agreed
4	Excess teaching load does not permit the use of the strategy	*2.72*	0.82	Agreed
5	Lack of interest on the part of school heads motivates science teachers on the use of local materials to develop entrepreneurial skills in students.	2.80	0.81	Agreed
6	Inadequate number of chemistry teachers who are prepared to use local materials in the development of entrepreneurial skills in students.	2.92	0.81	Agreed
7	Cost effective nature on the assembly of those local materials.	2.61	1.01	Agreed
8	The consuming nature in the utilization of those local materials in the classroom teaching.	2.83	0.71	Agreed
9	Lack of water and electricity and laboratory supply for the effective utilization of those local materials during teaching.	2.52	0.92	Agreed
10	Lack of interest on the part of students on the consumption of principles and skills involved in these local materials.	2.58	0.58	Agreed
11	Non-inclusion of the entrepreneurial education in secondary school curriculum.	2.80	0.81	Agreed
12	Non-accessibility of some of the important local materials during science teaching.	2.83	0.73	Agreed

The data reported on table 3 shows that all the 12 items were above the cut-off point of 2.50. This shows that respondents agreed that all the items in the questionnaire are challenges for development of entrepreneurial skills using local materials.

DISCUSSION

The findings of this study showed that the chemistry teachers used in this study disagreed that they have appropriate knowledge and skills on entrepreneurship education but are willing to do so. This means that they do not have the competence to develop entrepreneurial skills in themselves through chemistry education. The chemistry students also agreed that they need time to up-date their entrepreneurial knowledge and skills before they can impart same to other students through science teacher education. The findings also showed that the chemistry students used in the study are prepared to teach entrepreneurial skills if properly equipped to do so. From the above findings there is clear evidence that chemistry education in Nigeria is not functional yet and this tallied with the

observation made by [2], who maintained that Nigerian education is purely academic education. This is because teachers do not possess the prerequisite skills to teach chemistry effectively. The findings of this study also identified the challenges of developing entrepreneurial skills in secondary school students; through chemistry education to include the following: exclusion of entrepreneurship education from the secondary school curriculum, inadequate number of chemistry teachers who are prepared to use local materials in the development of entrepreneurial skills in students, lack of water, electricity supply and laboratory for the effective utilization of those local materials during teaching and non-accessibility of some of the important local materials during chemistry teaching.

EDUCATION IMPLICATION OF THE STUDY

The importance of integration of entrepreneurial skills into chemistry teaching instruction does not only end with helping the students to become self-reliant, but contribute toward building a sustainable national development. The chemistry teachers should therefore, be encouraged to integrate and help to develop more entrepreneurial skills into science leaching instruction for varieties of opportunities in the labour market. The high number of chemistry teachers without pre-requisite skill for the development of entrepreneurial skills shows that work is needed in the area of teaching preparation.

RECOMMENDATIONS

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

1. Redesigned science teacher education programme to include entrepreneurial skills acquisition which seems lacking in the present teacher education programme.
2. Reform the curriculum to be competency based, interactive and problem-solving based teaching and learning which will provide students with necessary skills for future employment and self-reliance.
3. Effective utilization of local materials in science teaching in order to make students realize the economic application of science to real life.
4 Utilization of local resources for enabling students tap the accumulated natural resources in the country.

CONCLUSION

Developing entrepreneurship skills in chemistry students are important hence, the chemistry teachers should be adequately prepared to impart these skills to their students. Thus the inclusion of entrepreneurship education in various teacher education programmes is imperative. This is to equip the science teachers with relevant entrepreneurial skills which they would impart to their students during the teaching of the different science subjects. To achieve this, entrepreneurship education should be included in the educational programmes for different levels of education (particularly at the secondary

education level). Government on his part should equip the secondary schools properly by providing facilities like science laboratories.

REFERENCES

1. Udogu, M.E. (2010). Status of resources and pedagogical methods/strategies utilized in chemistry in colleges of education using NCCE minimum standard bench-mark. Unpublished Ph.D. Dissertation: Nnamdi Azikiwe University, Awka.
2. Okoli, J.N. (2009). Preparedness of STM teachers to develop entrepreneurial skills in secondary school student through STM education.
3. Igbo, C.A. (2007). Towards Inculcating Entrepreneurship skill in Senior Secondary School Chemistry.
4. Njoku, Z.C. (2004). Fostering the application of science education research finding in Nigeria classroom. Strategies and needs for teacher's professional development. STAN processing of the 45th annual conference, 217-222.
5. Humber, R.R. (2009). Science education and national development. Being a paper presented at the ASSURS Maiden National Academic Conference at COE Kastina 6th 9th October.
6. Muel!er, S.L. (2004). Gender gaps in potential for entrepreneurial across countries and cultures. Journal of developmental entrepreneurship 9(3) 199-220.
7. Scheela, W. and Hoa, T.T.U. (2004). Women entrepreneurs in a transition economy. The case of Vietnam. Journal of Management and Decision-making 5(1) 1 20.
8. Mkpa, MA (2003). Curriculum diversification as a bias for entrepreneurship, Journal of. the Curriculum organization of Nigeria (CON), 10(1) 16-21.