

## Identification of Production Skills Possessed By the Chemistry Teachers and Those Acquired By Students for Wealth Creation

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**Abstract:-** This study identified the production skills possessed by chemistry teachers and those acquired by their students for wealth creation. The population of the study comprised of all the chemistry teachers and chemistry students in the government owned secondary schools in the 6 Education Zones of Anambra State of Nigeria. The research questions are one hypothesis guided the study. The design for the study was survey. The sample for the study comprised of 108 chemistry teachers and 341 chemistry students selected from sixty-one (61) secondary schools in the state. The instrument for data collection was a structured questionnaire. The validated instrument had a mean reliability coefficient of 0.89 using Cronbach Alpha Technique. The research questions were answered using mean and standard deviation while the hypothesis was tested using t-test statistics at 0.05 levels of significance. The findings revealed among others that chemistry teachers do not possess enough production skills to be imported to students and the students therefore do not acquire those skills that will help them to create wealth when they graduate. Also both teachers and students agreed that the listed products skills could help in wealth creation for school leavers if they learn to produce them. Recommendations and conclusions were made.

### I. INTRODUCTION

The study of chemistry enables learners to understand the world around them. Fahmy (2000) stated that the most interesting aspects of chemistry is that it applies to our daily lives. In other words, chemistry is a real life science subject. Due to the importance of chemistry to national development, the revised chemistry curriculum for senior secondary schools in Nigeria (2008) has the following amongst others as the objectives which are in support for effective teaching and learning of chemistry:

- ❖ To enable students acquire basic theoretical and practical knowledge and skills.
- ❖ To enable students acquire Science, Technology and Mathematics (STM) knowledge and skills.
- ❖ To develop reasonable level of competence in ICT applications that will engender entrepreneurial skills.
- ❖ To enable students apply skills to meet social needs of creating employment and wealth.

These are to be achieved through the mode of skills possessed by the chemistry teachers. It calls that chemistry teachers should not be ignorant of applied production skill as one of their objectives in teaching chemistry so that learning will become effective and admirable. Skills according to Huffington (2005), is an ability and capacity acquired through deliberate, systematic and sustained effort to smoothly and adaptively carry out complex activities or job functions involving ideas. Skill possession is important because in keeping with the principle of comparative advantages, they make use of available natural and human resources for maximum output and for sustainable development thus production skill.

Production is the processes and methods employed to transform tangible inputs (raw materials to semi finished goods and sub assemblies) and intangible inputs (ideas, information and knowledge) into goods or services (Meriam, 2009). Production skill may, therefore, be seen as the expertise to do something at very large quantities which means that teachers should embrace production skill tenaciously to inculcate it in students for wealth creation. This production skill possession as one of the objectives in chemistry teaching can be said to be paramount to wealth creation.

Wealth creation is the combination of materials, labour, land and technology in such a way as to capture a profit. According to Smith (2011), wealth is created when we are able to produce a surplus over and above what we need to survive. Houghton (2009), wealth creation is an ability of one to develop his/her natural endowment for societal, economic improvement. There are numerous ways in which chemistry education can create wealth. Okenyi, Otehi and Njoku (2010) stated that the place of chemical education in wealth creation from waste is indispensable. This is because one can generate wealth by conversion of biodegradable materials to useful products such as biogas.

Eze (2010) advocated that if students were to acquire the relevant self reliant skills for the production of simple consumer goods like matches, baking powder, soap, detergents and so on through industrial and environmental chemistry, it can help them to create job for themselves and for others when they graduate. This will help to check unemployment and societal vices emanating from the unemployed and idle school leavers. A student that acquires production skills can easily be empowered after graduation and a stuff which a teacher doesn't have, he cannot impart in others (students) and the skills which has not been mastered cannot be demonstrated proficiently (Ubenyi, 2006). Therefore, it is a laudable venture to production skill possession of science teachers and students in general and chemistry in particular for wealth creation.

But even with all these efforts, unemployment has assured senitus dimensions in recent times. Fayomi (2007) suggested one possible way of solving this problem is through arousing youth's interest to appreciate self employment by applying their acquired skills in participation in private sector ventures. Unfortunately, Nigerian contemporary school leavers are apparently not well prepared to meet the challenges of participation in private sector that is becoming the dominant sector to Nigerian economy. It is therefore against this background that the researchers intend to find out the extent to which the production skills are possessed by the chemistry teachers and the extent to which the production skills are acquired by chemistry students in secondary schools.

### **Purpose of the Study**

The purpose of this study is to

1. Identify the production skills possessed by chemistry teachers.
2. Identify the production skills acquired by chemistry students.
3. Identify strategies for wealth creation amongst school leavers.

### **Research Questions**

To guide this study, the following research questions were formulated.

1. To what extent do chemistry teachers possess production skills for the mentioned products?
2. To what extent have chemistry students acquired skills in the production of the mentioned products?
3. To what extent would the under-listed strategies help in wealth creation amongst school leavers?

### **Hypothesis**

The following hypotheses at 0.05 levels of significance guided the study.

1. There is no significant difference between the mean ratings of chemistry teachers and that of their students on the production skills they possess.

## **II. RESEARCH METHOD**

The design for this study was survey and the study was carried out in all the Education Zones of Anambra State. The population of the study was made up of all the chemistry teachers and Senior Secondary Two (SS II) Chemistry students in government owned schools in Anambra State. The sample for the study comprised of one hundred and eight (108) chemistry teachers and three hundred and forty one (341) SS II Chemistry students who were randomly selected out of the 298 government owned secondary schools in Anambra State. The instrument used for data collection was a structure questionnaire constructed by the researcher.

The instrument was prepared in two forms although they are of the same content, one for the teachers and the other for the students. Both had five points rating scale of Very High Extent (VHE) – 5 points, High Extent (HE) – 4 points, Moderate Extent (ME) – 3 points, Low Extent – 2 points and No Extent (NE) – 1 point. Both questionnaires were made up of three sections. Section A comprised of personal data of the teachers and the students. Section B on production skills possessed by teachers and students and section C on strategies for wealth creation has fourteen (14) and seven (7) items respectively.

The instrument was validated by experts in Science Education and Educational Psychology and the mean reliability index of the instrument was 0.89 using Cronbach Alpha Technique. The researchers administered the questionnaire to the teachers and students in the selected schools and collected them back on the spot. Their responses were analyzed using mean ( $\bar{x}$ ) and standard deviation (SD) to answer the research questions and z-test statistics was used to test the hypothesis. The acceptance mean score of 3.00 and above indicated positive responses while a mean score of 2.99 or less indicated negative responses by the teachers and students.

### III. RESULTS

The results obtained were presented in tables according to research questions and hypothesis.

**Table 1: Mean Ratings of Chemistry Teachers on Production Skills they possess**

S/N	Items	$\bar{X}$	SD	Decision
1.	Making of candle from fats and oils	2.06	1.21	Accepted
2.	Making of polish from candle wax, lamp soot and fats	4.06	1.08	Accepted
3.	Making of creams/lotions	3.11	1.02	Accepted
4.	Preparation of jelly pomade (Vaseline)	3.06	1.06	Accepted
5.	Production of margarine or butters from fats and oils	2.5	0.78	Rejected
6.	Production of jam from fruits (e.g. citrus fruits)	1.61	1.08	Rejected
7.	Making of soapy and soapless detergents from saponification reaction	3.67	1.07	Accepted
8.	Extraction of dyes/perfume from plants flowers by sterilization process	2.28	1.9	Rejected
9.	Production of ethanol from fermented palm wine	2.61	1.46	Rejected
10.	Preparation of deionized water from wet cell	2.33	0.77	Rejected
11.	Extraction of essential oils from plants	1.78	0.77	Rejected
12.	Production of bleaching materials and antiseptics	3.11	1.13	Accepted
13.	Making of gun-powder from charcoal (wood charcoal)	2.06	1.47	Rejected
14.	Production of carbonates and other carbon compounds from locally available materials such as shells, alkanols etc	2.89	1.28	Rejected
	Grand mean	2.72		

Table 1 showed that the mean ratings of chemistry teachers on the production skills they possess. It revealed that 6 out of the 14 items listed are the production skills possessed, which helps for wealth creation.

**Table 2: Mean Ratings of Chemistry Students on the Extent they have acquired skills in production of mentioned products.**

S/N	Items	$\bar{X}$	SD	Decision
1.	Making of candle from fats and oils	2.85	1.45	Rejected
2.	Making of polish from candle wax, lamp soot and fats	3.58	1.60	Accepted
3.	Making of creams/lotions	2.13	1.30	Rejected
4.	Preparation of jelly pomade (Vaseline)	2.28	1.34	Rejected
5.	Production of margarine or butters from fats and oils	1.86	1.19	Rejected
6.	Production of jam from fruits (e.g. citrus fruits)	1.97	1.24	Rejected
7.	Making of soapy and soapless detergents from saponification reaction	2.88	1.48	Rejected
8.	Extraction of dyes/perfume from plants flowers by sterilization process	1.99	1.36	Rejected
9.	Production of ethanol from fermented palm wine	2.53	1.46	Rejected
10.	Preparation of deionized water from wet cell	1.79	1.23	Rejected
11.	Extraction of essential oils (terpenes) from plants	2.00	1.41	Rejected
12.	Production of bleaching materials and antiseptics	1.94	1.27	Rejected
13.	Making of gun-powder from charcoal	1.72	1.25	Rejected
14.	Production of carbonates and other carbon compounds from locally available materials e.g. shells	1.75	1.13	Rejected
	Grand mean	2.23		

Table 2 revealed that the chemistry students have acquired the production skill for only items 2. And for all other items in table 2, they have not acquired the skills for their production.

**Table 3: Strategies for Enhancing Wealth Creation among school leavers**

S/N	Items for Teachers	Teachers			Students		
		$\bar{X}$	SD	Decision	$\bar{X}$	SD	Decision
1.	Making of candle from fats and oils	4.89	0.32	Positive	4.13	0.99	Positive
2.	Making of polish from candle wax, lamp soot and fats	4.83	0.38	Positive	4.16	1.29	Positive
3.	Making of creams/lotions	4.06	0.84	Positive	3.73	1.26	Positive
4.	Preparation of jelly pomade (Vaseline)	4.17	0.79	Positive	3.65	1.21	Positive
5.	Production of margarine or butters from fats and oils	4.72	0.59	Positive	4.18	0.97	Positive
6.	Production of jam from fruits (e.g. citrus fruits)	3.94	0.89	Positive	3.85	1.13	Positive
7.	Making of soapy and soapless detergents from saponification reaction	3.78	0.88	Positive	3.53	1.23	Positive

Source of Variation	No	Grand Mean ( $\bar{X}$ )	Grand SD	df	Cal-z	Critical (z)	Level of Sig.	Decision
Teachers	108	2.72	1.20	447	2.60	1.96	0.05	$H_0$ is Rejected
Students	341	2.23	1.34					

**Table 3** showed that both the chemistry teachers and students agreed that the seven (7) items listed would help in creating wealth for school leavers.

**Table 4:** z-test Analysis of Difference between two means of chemistry teachers' and students' responses on production skills possessed/acquired.

Table 4 showed that at 0.05 level of significance z-calculated (2.60) is greater than z-critical (1.96) and so the null-hypothesis is rejected. Hence there is a significant difference between the mean ratings of chemistry teachers and that of their students on the production skills the teachers possess and those the students acquired.

#### IV. DISCUSSION OF THE FINDINGS

The findings revealed in table 1 that chemistry teachers do not possess production skills in the mentioned products. This had led to the students not acquiring these skills because one cannot give what he does not possess. Thus Ubenyi (2006) opined that a staff which a teacher does not have, he cannot impact them in students and the skills which have not been mastered cannot be demonstrated proficiently. This therefore has led to the continued graduation of students that could not complete favourably in boasting the wealth of this nation. Table 2 revealed that chemistry students acquired little or no production skills that will help them to create wealth in future. Since their teachers do not possess these skills, they cannot impart it in them.

Both the chemistry teachers and the students agreed that all the items listed in table 3 were strategies that would help to create wealth for school leavers. These strategies would help students to acquire skills, such skills can help these students when they graduate to become self employed where they cannot secure white collar jobs. This is in agreement with the findings of Eze (2010) who advocated that if students were taught the production of simple consumable goods like matches, baking powder, soaps, detergents and soap through environmental and industrial chemistry, they can acquire self-reliant skills to create jobs for themselves and for others when they graduate. This will help check unemployment, and societal vices emanating from the unemployed and idle school leavers.

#### V. CONCLUSION

The study revealed that chemistry teachers do not possess enough production skills that can be acquired by the students for wealth creation. This can be attributed to some factors such as

- Teaching method
- Lack of infrastructure and teaching resources
- Classroom environmental factors in terms of engaging the students in more practical work using local materials for production. Also classroom lessons are not related to everyday life activities.
- Poor attitude of the students in terms of developing among themselves the spirit of group/team work during practicals.
- Poor quality of teaching staff
- Poor rewarding of teacher's and students with outstanding performance.

This lack of production skills among teachers and students of chemistry if not well addressed will make chemistry a theory subject but chemistry should be taught as a practical subject. It therefore calls for adjustment and inclusion in teaching of chemistry production skills to help the learners attain the self reliant skills necessary fro societal needs and demands

## **VI. RECOMMENDATIONS**

- i. The curriculum planners should integrate production skills and wealth creation concepts into the chemistry curriculum for variety of opportunities in the labour market.
- ii. The government should build well-equipped laboratories in all the secondary schools in order to improve learning environment for chemistry teaching and learning.
- iii. Government and Educational Administrators should as much as possible encourage and sponsor science teachers to attend in-service training, workshops, conferences and seminars to update their knowledge on the innovative teaching methods.
- iv. Making our students to acquire production skill is very important because a nation with plans or aspirations for economic development and technological advancement cannot afford to neglect the development of human resource for productivity.

## **REFERENCES**

- [1]. Eze, C.C. (2010). Repositioning Chemistry Education in Nigerian Colleges of Education for Economic Empowerment. 51<sup>st</sup> Annual conference Proceedings of STAN. 287 – 292.
- [2]. Fayomi, S.B. (2007). Entrepreneurship Education for Employment Opportunities Awareness Creation among Undergraduates of Obafemi Awolowo University Ife. *Journal of Education Studies*. 13(1), 57-65.
- [3]. Huffington, (2005). Dictionary.com.online. [www.Business Dictionary.com/definition and meaning](http://www.Business Dictionary.com/definition and meaning).
- [4]. Houghton, M. (2009). Wealth Maximization as a Normative Principle. *Journal of Legal Studies*.
- [5]. Merriam, W. (2004). Online [www.Merriam Webster.com/achieve/openedition.org](http://www.Merriam Webster.com/achieve/openedition.org).
- [6]. Okenyi, B., Ngozi Olehi, L.C. & Njoku, B.A. (2010). Policy Framework for Green Chemistry: National Development Challenges in Focus. 33<sup>rd</sup> Annual International Conference Workshop and Exhibition of the Chemical Society of Nigeria.
- [7]. Smith, A. (2009). An inquiry into the Nature and Causes of the Wealth of Nations.
- [8]. Ubenyi, M.O. (2006). NCE Technical Students' Training Requirements of Graduation. Relevance and Actualization to Job Creation. *Journal of Research in National Development on Technical Education*.