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## **Assessment of Production Skill Acquisition and Strategy for Capacity Enhancement in Pre-Service Science Teachers in Colleges: Implication for Millennium Development Goals (MDGs) Realization**

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### **Abstract**

*The study was a survey research which investigated the production skills possessed by pre-service NCE teachers, strategies for capacity enhancement and the possible confronting problems. Two hundred pre-service NCE teachers were drawn from the seven colleges of education in the five states in the zone. A structured questionnaire was used for the study. The questionnaires were content validated by experts in the field and reliability sought, using Cronbach alpha technique which was established 0.87. Four research questions and one hypothesis which guided the study were analysed*

*using means standard deviation and t-test at 0.05 significant level respectively. The results of the study reveal that the pre-NCE teachers were found to possessed skills for item 3 and 4 only. Also pre-service teachers agreed that apart from items 8, 10 and 11 all others are powerful strategies for building capacity in them during their training in the colleges. All the items on tables 3 were agreed to be problems to this capacity building except for items 8, 9 and 10. Based on the findings of this study, it was recommended that all the suggested strategies should be explored by teachers' trainers for the capacity enhancement of pre-service teachers. The federal government and college management should try to alleviate some of these possible confronting problems.*

**Key words:** National certificate in Education (NCE), National Economic Empowerment Development Strategy (NEEDS), Millennium Development Goals (MDGs)

### **Introduction**

Nigeria is one of the African Countries faced with economic problems. These problems have given rise to the depreciation of our Naira, high rate of unemployment, crime of different kinds, poverty, hunger and frustration. This present situation has occasioned increased awareness in Nigerians of the need for self-employment and self-reliance (Okeke, Egbuonu and Ugbaja 2009). These challenges have led Nigeria to search for new world order by redefining their social economic, policies and priorities in order to meet up with the above challenges.

Various Nations of the world adopted a global programme called Millennium Development Goals (MDGs) in September 2000 to attain a high level of sustainability by achieving certain goals far or before 2015. MDGs is an anti-poverty strategy of the United Nations which focuses heavily on poverty reduction through the promotion of economic growth (Okeke BC 2008). The eight goals of MDGs include among others: the halving extreme poverty, hunger, promotion of gender equality and women empowerment (Wikipedia, n.d. and FRN 2005).

However, Nigeria among the 192 UN members that accepted the MDGs has established certain programmes such as National Economic Empowerment Development Strategy (NEEDS) in 2004 in order to achieve the MDGs and surmount her environmental challenges. NEEDS, a plan for prosperity and a way to overcome the deep and pervasive obstacle to progress that

government and people have identified, has focus on the following four strategies

- Wealth creation
- Poverty reduction
- Employment generation
- Value re-orientation (National Planning Commission (2004))

MDGs, and NEEDS focus on youth development and empowerment using education. Their primary objectives are mainly to equip the youth with scientific and technological skills, which will transform the youths and graduates from institutions to become:

- Job creators and not job seekers
- Employers and not employees
- Transform government from a haven corruption to an institution that spurs development and service to people.
- To make Nigeria socially and economically developed with equal opportunity for her citizenry (Ejiogu 2006).

The trend now in the society, according to Oladimi (2002) and Okolocha (2006), shows that the level of one's education does not have a significant effect on one's growth; rather the effect is more pronounced on the level of skills possessed and ability to apply the skills in the real world of work. This is why Lawal (2009) posited that Nigerian education system at all levels must be geared towards equipping future generation with necessary skills, knowledge and attitude for coping with the ever demanding world of science and technology.

From the on-going discussion, it has become very clear that education of the youths should be focused more on capacity building rather than on the mere acquisition of scientific facts and principles. Capacity building according to Okeke and Egbunu (2008) is given individuals training to enable them perform entrepreneurial tasks. It enables the individuals become more creative and thus sees opportunities where none seems to exist (Okeke 2007).

Capacity building means an integration of both entrepreneurial and occupational skills. While occupational skills are scientific production skills

(process skills) that lead to the manufacturing of goods like paints, candle, laboratory chemicals etc., entrepreneurial skills are business managing skills like creative thinking, decision making, marketing etc. (Olutoyin 2009).

The challenge facing Nigerian science teachers at present is how to use STEM education to achieve MDGs. The present study focuses on capacity building in pre-service NCE science teachers in colleges. These pre-service NCE science teachers need to be exposed to both entrepreneurial and occupational skills while still receiving their NCE educational training as teachers. This will help prepare them on how to produce substances like soap, ethanol, detergent, salt, flour, shoe polish etc. The acquisition of these skills will not only prepare them as effective science teachers for primary and secondary schools, but will also equip them with appropriate skills and competences for self-employment and self-reliance. Attainment of these means actualization of MDGs. The problem of this study is that the pre-service NCE science graduates and those from other subject areas find it difficult to get teaching jobs or set up and handle their own businesses which resulted in high rate of unemployment, object poverty and hunger in the society.

There is need to ascertain the level of production skills possessed by pre-service science teachers and also identify strategies for building capacity in them during their training period in the colleges. It becomes therefore necessary to carry out empirical study to ascertain the level of production skills possessed by pre-service NCE science teachers and strategies for building capacity in them.

### **Purpose of the study**

The purpose of this study is to investigate specifically

1. The production skills possessed by pre-service NCE science teachers in colleges.
2. Ascertain the strategies for capacity building in pre-service NCE science teachers.
3. Ascertain possible confronting problems to capacity building in pre-service science teachers.
4. Influence of gender on the pre-service teachers' view to the strategies for capacity building was also sought.

### **Research questions**

1. To what extent do pre-service NCE science teachers possess production skills relevant for the manufacture of consumer's products?
2. What are the strategies for building capacity in pre-service NCE science teachers?
3. What are the possible confronting problems associated with capacity building in science teachers?
4. What is gender influence on the pre-service science teachers' view on the strategies for capacity building in them.

### **Research hypothesis**

H<sub>0</sub>: There is no significant difference between the mean rating scores of male and female pre-service science teachers responses on the strategy for building capacity in them.

### **Methodology**

**Design:** The design is a descriptive survey.

**Area of study:** The research was carried out in the South-East zone of Nigeria made up of five states (Anambra, Abia, Ebonyi, Enugu and Imo).

**Population of the study:** All the (280) final year NCE science (Biology, chemistry and physics) students from seven colleges (Federal and State) in the five states in the zone.

**Sample:** The sample is made up of two hundred (200) out of two hundred and eighty (280) final year NCE science students from the seven colleges (federal & states) in the five states in the zone.

**Instrument for data collection:** Three structural questionnaires were used to elicit information as follows: the level of production skills possessed by pre-service teachers; information on the strategies for building capacity in service teachers in colleges and finally information on the possible confronting problems to this capacity building in students.

**Research Questions 1:** *To what extent do pre-service NCE science teachers possess production skills relevant for the manufacture of consumer's products?*

Table 1: Mean rating scores on production skills possessed by pre-service science teachers in colleges.

S/No	Skills for the	Mean
1	Production of Acid for batteries	1.73
2	Production of ethanoic acid	2.03
3	Production of shoe polish	2.90
4	Production of soap	2.61
5	Production of alkanate for perfumes	1.82
6	Production of alkanates for food flavouring	1.70
7	Production of water treatment chemicals	0.94
8	Production slaked lime from limestone	1.76
9	Product of chalk from gypsum salt	1.93
10	Product of tooth paste	2.13
11	Lubricating grease manufacture	1.78
12	Insecticides and antiseptic manufacture	1.04

Table 1 above indicated that the pre-service NCE science teachers possess only production skills for production of shoes polish and soap making.

**Research question 2:** *What are the strategies for building capacity in pre-service NCE science teachers?*

Table 2: Mean rating scores of pre-service teachers on strategies for capacity building.

S/No	Items	Mean
1	Expose them on the process of extracting and selling of some medicinal plants extracts for curing diseases.	3.85
2	Biology student should be exposed on how to keep and generate income through pottery and fisheries during their training in the college.	3.62
3	Organize regular visit to technology centre and manufacturing industries for skills acquisition.	2.75
4	Encourage active participation in group discussions and activities to enable them develop team spirit.	2.50
5	Make attendance to workshops, seminars and conferences compulsory during the period of their training.	2.88
6	Curriculum be redesigned to include more occupational activities and process of production.	3.60
7	Link college activities to community and societal	2.85

	problems for them to always see opportunity where one seems not to exist.	
8	Expose them on how to produce and sell common laboratory chemicals to nearby secondary schools.	1.98
9	Expose pre-service teachers on how to produce and market some common consumer goods like soap, detergents, powders, dettol etc to nearby market.	2.88
10	Production of these laboratory chemicals and consumer goods should be made compulsory and part of their graduation requirements.	1.75
11	Encourage them on how to collect materials from local communities and transform them into useful products e.g. natural resins from plants for making gums, tyres etc.	1.68

Table 2 above indicated that pre-service NCE science teachers agreed that apart from items 8, 10 and 11 all others are powerful strategies for building capacity in them during their training in the colleges.

**Research Question 3:** *What are the possible confronting problems associated with capacity building in science teachers?*

Table 3: Mean rating scores of pre-service teachers on possible confronting problem associated with capacity building.

S/No	Items	Mean
1.	Lack of materials needed for the production of these mentioned goods.	3.11
2.	Non-availability of effective and functional laboratories for activities and laboratory works.	2.98
3.	Insufficient time allocated for the accumulated skills to be acquired.	3.42
4.	Poor knowledge of skills on the part of teacher trainers in colleges.	3.64
5.	Pre-service students' unwillingness to learn the skills involved.	2.88
6.	Project design consumes a lot of money.	3.30
7.	Lack of time for proper industrial training in industries and technologies.	3.66
8.	Inadequate provision of design project textbooks for referencing.	1.28
9.	Lack of co-operation among students when it involve group.	2.00
10.	Unwillingness on the part of some teacher trainers in colleges.	1.80

Summary for table 3: All the items were seen as possible confronting problems except items 8, 9 and 10.

### **Discussion of the findings**

The findings of this study have revealed that the pre-service NCE science teachers lack production skills in almost all the substances mentioned in the study except in the production of shoe-polish and soap. This tallied with what Ejiogu (2006) posited that Nigerian education system lacks functionality and focus, rendering the education of our youths hopeless because they lack vital skills needed to ignite the latent talents in them. He continued to say that they (graduates teachers) roam about the street of the nation seeking employment with their certificates. May be this is why poverty and hunger are on its peak. This has come to jeopardize the realization of the objectives of the MDGs which has job creation, wealth generation and poverty alleviation among other objectives as its focus.

The study also revealed the powerful strategies to be employed through STM education for building capacity in our pre-service NCE science teachers. This was indicated by their ratings on the suggested strategies. Their agreement on these suggested strategies shows that if these strategies are strictly followed, they will be exposed to the acquisition of skills for the production and synthesis of these substances mentioned earlier. This is in perfect agreement with what Onwuegbuna (2009) posited that skill acquisition is needed in our youth to enable them maximize the use of existing resources for firm career commitments such as setting up businesses, marketing services or being produce employees of organization.

This notwithstanding, there was an indication from the findings that some problems may confront this venture. All the items on table 3 with exception of items 8, 9 and 10 were agreed to be possible confronting problems that may be associated with the exercise. Finally, gender has no influence on the responses as the  $t$ -calculated is far smaller than the  $t$ -critical. Male and female pre-service teachers responded with equal capacity to the items. This therefore means that gender has no influence on their responses.

### **Conclusion**

Considering the importance and need for job creation and wealth generation in Nigeria, to reduce the problem of unemployment, poverty and hunger,

current practices in science, technology and mathematics teaching in the teacher education program do not give room for the acquisition of the skills needed for their attainment. This calls for need to re-orient the strategies used in STM education to enable the NCE graduate teachers of science to adapt to this changing situation in the country in order to create alternatives to their teaching jobs. This re-orientation to teaching strategies is very crucial particularly now that employment into teaching is no longer automatic like in the good old days when the teaching job awaits pre-service teachers once they leave school. When this is achieved, in education system for teachers, MDGs actualization is almost at the doorstep.

### **Recommendation**

- ❖ Teacher education programme should be restructured to incorporate production skills.
- ❖ Emphasis should be laid on production and selling of consumer goods during their training as teachers.
- ❖ Pre-service NCE science teachers should be given the opportunity to go on industrial training by introducing it in the academic programme.
- ❖ The science laboratory should be well equipped.
- ❖ Experience laboratory technologist should be employed to guide the pre-service teachers on laboratory works,
- ❖ Field trips to manufacturing industries should be encouraged.
- ❖ Career oriented teaching as instructional strategy be adopted.
- ❖ The federal government and college management should try to alleviate some of these possible confronting problems.

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