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# Identification Of The Training Needs Of Basic Science Teachers In Benue State, Nigeria


**By**

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**Abstract**

*This study was carried out to identify the training needs of Basic Science teachers. The area of study is Katsina-Ala, Makurdi and Vandeikya local government areas of Benue State. The sample for this study comprised 75 Basic Science teachers from 30 randomly selected secondary schools in the 3 LGAs of the state. Data were collected using Teachers' Training Needs Assessment Questionnaire (TTNAQ) administered on teachers of Basic Science. The data were analyzed using mean scores and t-test. The study established that those who teach Basic Science specialized in other subject areas other than Basic Science and that all Basic Science teachers had one training need or another. The study also found out that there was no significant difference in the mean perception scores of experienced and inexperienced Basic Science teachers regarding their training needs. It is therefore, recommended among others that for Basic Science teaching to improve, there is an urgent need to improve the quality of Basic Science teachers through sustained in-service training. It is also recommended that Basic Science teachers should take conscious and deliberate efforts towards self-development.*


The quality of education in any society and at any level is a function of the quality of its teachers. This is explicitly stated by Nigeria's national policy on education that "no education system can rise above the quality of its teachers (FRN, 2004)". This implies that if an educational system is to live up to its social responsibility, a lot needs

to be invested in teacher training. Perhaps, the greatest challenge to teachers and the teaching profession is the extent to which the teaching profession is able to meet the country's educational objectives. The national educational objectives of Nigeria as stated in the national policy layed emphasis on science and technology. Furthermore, the success of science education from basic science and technology education program lies at the door-step of the teacher whose role is to implement the science curriculum.

At the upper basic level, students are presented with basic science, which is the first form of science a child comes across at the secondary level; hence basic science prepares students for the study of core science subjects; physics, biology and chemistry at the senior secondary school level (Oludipe, 2012). Basic science is a concept in science teaching in Nigeria that came to replace integrated science. It emphasizes scientific literacy and research oriented learning (Eles, 2009). Basic science which evolved from integrated science is the basic training in scientific skills required for human survival, sustainable development and societal transformation (Chukwuneke & Chikwenze, 2012).

Literature reveals that process oriented activities are not usually carried out in Basic Science class rooms in Nigeria (Chukwuneke & Chinkwenze, 2012). This could be because of the socio-economic and political situation in the country that has made the Nigerian teacher to channel his/her energies towards survival rather than professional growth (Ortese & Odey, 2003). This could also be as a result of lack of adequate laboratories and equipment, overcrowded classrooms, inappropriate teaching method and lack of in-depth knowledge in content area. Insufficient time on the school timetable, how to make teaching, child centered and activity oriented (Maduabum, 1990; Chukwuneke & Chinkwenze, 2012).

In view of the challenges that basic science teachers face in execution of their job, does the system have strategies put in place to narrow the widening gap between children's expectation of science and what they actually experience? How can teachers make teaching of science learner-centered and activity oriented? For the teacher of Basic Science to overcome these challenges he needs to be well trained and retrained. That is why, Ighodal and Olumyomi,(2004) stated that there are on-the-job opportunities for professional development of teachers such as meetings, conferences, workshops, symposia among others. Since creative and effective science teaching requires that a teacher is conversant with science teaching approaches and an in-depth knowledge of the content and philosophy of basic science curriculum, it becomes imperative to identify those felt training a improvement needs that can help raise the quality of teachers, irrespective of gender, who will in turn raise the quality of instructions so that the students can obtain a coherent view of science. Though, Morrison and Mcintye,(1971) expressed fear that teaching profession is increasingly

becoming a predominantly feminist affair and that the sex of a teacher is a factor which affects classroom relationships and a teachers degree of involvement in the job of teaching.

Basic science being a new subject, the teachers of basic science seems to lack appropriate skills and content knowledge to teach basic science in line with its philosophy and objectives. This is most especially so because most teachers who teach the subject are not professionally trained (Gyuse & Ada, 2008). Aba (2004) observed that only 12% of teachers who currently teach the subject are trained to teach the subject. Ada (2003) ascertains that there is no significant difference in the perception of professional and non-professional teachers of integrated science (basic science).
There is therefore, every need to train these teachers. The problem therefore, is what are these needs and how can they be met? Are the training needs of specialist basic science teachers the same or different from non – specialist basic science teachers? Who should be trained? In what areas does the teacher need the training? Attempts at finding solutions to the above questions underscore the importance of this study.

**Research Questions**

The following research questions guided the study:

1. To what extent are Basic Science teachers professionally trained to teach the subject?
2. What are the training needs of the Basic Science teachers?
3. In what areas are the training needs most needed?
4. What is the perception of the Basic Science teacher on the issues of professional development?

**Hypotheses**

The study was guided by the following hypotheses;

***$Ho_1$*.** There is no significant difference between the mean scores of professional and non – professional basic science teachers and their training needs.

***$Ho_2$*.** There is no significant difference between the mean perception scores of experienced and inexperienced basic science teachers in the training needs.

$Ho_3$. There is no significant difference between the mean perception scores of male and female teachers on their training needs.

**Methodology**

The study adopted a sample survey research design with the aim to identify the training needs of basic science teachers in Nigeria. A sample survey is one in which a portion of the population (sample) is considered to be representative of the entire population studied. The population for the study is 720 teachers of basic science in Benue state. Benue state has about 603 public secondary schools (Teaching Service

Board, 2014). The schools were stratified as Government – owned, Mission – owned, Community – owned. Seventy basic science teachers constitute the sample for the study. The teachers were selected from 30 secondary schools from 3 LGAs of Katsina – Ala, Makurdi and Vandeikya across Benue State. The instrument used to obtain data for this study was a 30-item researchers-developed Teachers' Training Needs Assessment Questionnaire (TTNAQ). The questionnaire was divided into section A which sought to collect information about the bio data of the respondents such as sex, teaching experience, area of specialization, qualifications, professional status among others; and section B which was concerned with collection of information from basic science teachers on their training needs. The 5 – point Likert type rating scale for measuring attitude was adopted for scoring responses of respondents. A higher value indicates a more positive response than a lower value.
Strongly Agree (SA) 5; Agree (A) 4; Undecided (U) 3; Disagree (DA) 2; Strongly Disagree (SDA)1

**Validity and Reliability of Instruments**

To determine validity and reliability of the instruments, effort was made to relate each item in the questionnaire to specific variable. Logical validity of the instrument was sought by subjecting it to critical appraisal of some experts, two in Educational Measurement and Evaluation and Science Education from Benue State University, Makurdi. They were requested to check for ambiguity of items in relation to appropriateness of the items, content validity and relevance to the issue under investigation.

A pilot study was done to test for the reliability of the instrument using thirty (30) questionnaires. These were entered into Statistical Package for Social Sciences (SPSS) to run the reliability test using Cronbach's Alpha. The test yielded a coefficient of 0.82. This indicates that the instrument is reliable.

**Findings**

**Research question 1**

To what extent are basic science teachers professionally trained to teach the subject?

The findings to this research question are presented in table 1.

**Table 1. Distribution of Respondents by Area of Specialization**

| Area of Specialization | **N** | **%** |
|---|---|---|
| Biology | 24 | 34.3 |
| Bio/Chem | 8 | 11.4 |

| | | |
|---|---|---|
| Integrated Science/Basic science | 12 | 17.1 |
| Chemistry | 12 | 17.1 |
| Others | 14 | 20.0 |
| Total | 70 | 100 |

The analysis as presented in Table 1 shows that the teachers are not professionally trained only 12 of the respondents specialized in basic science but 4 are trained at NCE level and 14 (20.0%) had other qualifications. Majority of the teachers of basic science specialized in biology with 24 (34.3%). Chemistry and basic science followed with 12 (17.1%), bio/chem. 8(11.4%).

**Research Question 2**

What are the training needs of the basic science teachers?

**Table 2 Distribution of Respondents by Training Needs**

| In what areas do you need further training to be more effective? | **N** | **%** |
|---|---|---|
| Content area drawn from chem. | 12 | 18.2 |
| Content area drawn from biology | 8 | 12.1 |
| Content area drawn from physics | 12 | 18.2 |
| Methodology of teaching basic science | 12 | 18.2 |
| Improvisation of teaching resources | 22 | 33.3 |
| Total | 66 | 100 |

Table 2 shows that the area where training is most needed is the improvisation of teaching resources with 11(33.3%). This is followed by content areas drawn from chemistry, physics and basic science, each of the area having 6 respondents 18.2%. This has also answered the research question 2, which seeks to find out in what areas further training is needed to be more effective.

**Research Question 3**

What is the perception of the basic science teachers on the issues of professional development?

**Table 3 Perception of Basic Science Teachers on Issues of Professional Development**

| **S/no** | **Issues** | **Agree** | **%** | **Disagree** | **%** |
|---|---|---|---|---|---|
| **1** | I have the motivation to seek further training | 60 | 85.7 | 5 | 14.3 |

| | | | | | |
|---|---|---|---|---|---|
| **2** | I feel it is necessary to seek avenues to grow professionally | 66 | 94.3 | 2 | 5.7 |
| **3** | I feel I should specialize in another area of science for fear of being a permanent junior teacher | 24 | 34.3 | 17 | 48.6 |

Table 3 shows the perception of basic science teachers on issues of professional development. It can be observed from the table 4 above that 30(85.7%) of the teachers agree that they have the motivation to seek further training. Only 14.3% say that they disagree. Also 33 (94.3%) agree that they feel it is necessary to seek avenues to grow professionally. The table also shows that 17(48.6%) are against changing their profession to other areas of science for fear of permanent junior teachers.

**Hypothesis 1**

There is no significant difference between the mean scores of professional and non – professional basic science teachers on their training needs.

Table 4 t-test table for the significant difference between non – professional and professional basic science teachers in their mean scores of their training needs

| Category of respondents | N | X | SD | SEM | 95% Conference of the interval difference Lower | Upper | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| Non – professional integrated science teachers | 12 | 30 | 2.0 | 0.71 | -7.17 | -3.50 | -7.46 | 5 | 0.001 |
| Professional integrated science teachers | 12 | 35.3 | 3.6 | | | | | | |

***NB:*** SD = standard deviation, SEM = Standard Error mean X = mean

From the paired t-test in table 4, (t= -7.46, df = 5, P = 0.001), since $P < 0.05$, the null hypothesis is rejected. From the paired samples statistics in table 4, the mean perception score of the training need of non – professional basic science teachers is 30.0 while the mean perception score of the training need of professional basic science teacher is 35.3.

**Hypothesis 2**

There is no significant difference between the mean perception scores of experienced and inexperienced basic science teachers in their training needs.

Table 5: t-test table for the significant difference between the mean perception scores of experienced and inexperienced basic science teachers in their training needs.

| | 95% Conference of the interval |
|---|---|

| Category of respondents | N | X | SD | SEM | difference Lower | Upper | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| Experienced basic science teachers | 24 | 47.1 | 11.2 | 2.02 | 4.56 | 13.30 | 4.41 | 13 | 0.001 |
| Inexperienced basic science teachers | 24 | 38.1 | 5.7 | | | | | | |

From the paired t-test in table 5, (t=4.41, df = 13, P = 0.01). since P< 0.05, the null hypothesis has been rejected, this means that the difference in the perception scores of training needs of experienced and inexperienced basic science teachers is significant. From the paired sample statistics in table 5 47.1 and 38.1 are the mean perception scores on training needs of experienced and inexperienced basic science teachers respectively.

**Hypothesis 3**

There is no significant difference between the mean perception scores of male and female teachers on their training needs.

Table 6 t-test table for significant difference between the mean perception scores of male and female teachers on their training needs.

| Category of respondents | N | X | SD | SEM | 95% Conference of the interval difference Lower | Upper | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| Male basic science teachers | 34 | 37.1 | 6.5 | 1.85 | -10.51 | -2.67 | -3.5 | 15 | 0.003 |
| Female basic science teachers | 34 | 43.7 | 11.8 | | | | | | |

The paired t-test in table 6 (t=-3.56, df = 16, P = 0.003), since P<0.05, the null hypothesis has been rejected. From the paired sample statistics in table 6, it is shown that 37.1 and 43.7 are the mean perception scores of training needs for male and female basic science teachers respectively.

**Discussion of Findings**

From the analysis of the data collected, the study reveals the following findings. The study reveals that majority of teachers who currently teach basic science are not professionally trained to teach the subject as only 17.1% of the respondents are professionally trained to teach the subject. This finding tally with that of Aba (2004)

who also discovered that only 12.5% of teachers who currently teach the basic science (integrated science) are trained to teach the subject.

The study also reveals that improvisation of teaching resources is the most training needs of basic science teachers. The study also found out that basic science teachers have the motivation to seek further training and also feel that it is necessary to seek avenue to grow professionally. This finding disagree with Ortese and Odey, 2003 who argued that socio-economic and political situations in the country have made the Nigerian teacher to channel his energies towards survival instincts rather than professional growth.

Research hypothesis 1 revealed that as the result of the t-test shows, $P<0.05$, the null hypothesis is therefore rejected and the alternative hypothesis is accepted. This means that there is a significant difference between the mean scores of professional and non-professional basic science teachers in their training needs. This finding differs from Ada (2003) who found out that there is no significant difference in the perception of professional and non-professional basic science teachers on basic science programme.
Hypothesis 2 revealed that there is a significant difference between the mean perception scores of experienced and inexperienced basic science teachers in their training needs. This view tallies with Ighodal and Olumyomi (2004), Ada (2004) and Ortese and Ada (2003) who stated that there are on-the-job opportunities for professional development of teachers such as attending meetings, conferences, workshops, symposia among others.

**Hypothesis 3**

Revealed that at $P (0.03) < 0.05$ the null hypothesis is rejected. This means that there is a significant difference between the mean perception scores of male and female teachers in their training needs. This view tallies with Morison (1971), who asserted that the teaching profession is increasingly becoming a predominantly feminist affair and that the sex of a teacher is a factor, which affects classroom relationships and a teacher's degree of involvement in the job of teaching.

**Conclusion**

It can be concluded from this study that training and retraining of basic science teachers is very important for them to be more effective. The teachers that were trained to teach basic science need to be retrained to enhance professionalism while those trained in other fields need to receive further training to become professional basic science teachers. The differences in the mean score of training needs was an indication that different categories of basic science teachers (professional) and non-professionals, experienced and inexperienced male and female, need training in one area or the other.

**Recommendations**

Based on the findings of the study, the following recommendations are made with the hope of raising the quality of Basic Science teachers who will in turn raise the quality of instruction for the overall educational development of the nation:

1. There is compelling need to carry out a training need assessment of basic science teachers. This if done will help to identify areas of training and appropriate strategies for intervention and or training models put in place fothe professional development of the basic science teacher.
2. There must be strong political will for teacher retraining programme to succeed and government must develop necessary legislative instruments to guarantee success.
3. There is need to resuscitate the teacher –vacation – course. This is necessary because majority of basic science teachers seriously need on-the-job training in order to be equipped with the philosophy, objectives and instructional strategies for the teaching of the subject.
4. Teachers of basic science should make conscious and deliberate efforts towards self (professional) development even if the school authorities where they serve fail to sponsor them.
5. Due recognition must be given to teachers. Government at both Federal and State levels should be ready to motivate and encourage teachers by ensuring prompt payment of their salaries and other allowances to guarantee dedication towards optimum productivity.

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