Research Article

Influence of Academic Qualification and Gender on Teachers' Perception of Difficult Concept in Primary Science in Ikom Educational Zone of Cross River State, Nigeria.

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ABSTRACT

Science and technology education has continued to occupy the center stage in the technological development of nations. This realization has led to huge investments in science education at all levels of governance in Nigeria. It is however, disheartening, that despite such efforts by government, performance in basic sciences has continued to be low. Studies have suggested that the poor performance in the sciences could be attributed to perceived difficulty of science concepts on the part of the teachers. This study sets out to investigate the role of teachers’ qualification and gender on their perception of difficult concepts. The study used the ex-post facto or comparative design. Out of a population of 5200 teachers, a sample 520 was randomly selected and used for the study. Two hypotheses were formulated, tested and analysed using the Analysis of Variance (ANOVA) and independent t-test. The result showed that teachers’ qualification and gender have no significant effect on their perception of difficult concepts in Basic science. Based on the findings, it was recommended among others that the annual teachers retraining programme of the Cross River State government should be sustained and the methodology of teaching perceived difficult concepts in science should feature prominently in the course content for such programmes.

Keywords: Difficult concepts, Qualification, Gender, Science and Technology Education, Curriculum Implementer, Transformation of Society.

INTRODUCTION

Experience has shown that Science is the bedrock of all technological breakthroughs. It is through science that man has been able to expand his knowledge and exert pressure and exercise control over his environment. According to Owo (1990) the development of science and technology had a practical application and it was largely responsible for transforming the erstwhile societies of the western world into advanced societies. The importance of science in this technological era can, therefore, not be overemphasized. Fafunwa (1990) is of the view that we are living in a world where science and technology have become integral part of the world culture and any country that overlooks this significant truism does so at its own peril. Wasagu (1998) opened that science does not only affect us at any given time of our daily existence, it digs and pursues us. This implies that science lives with us and affects our living, both as individuals and as a society. Hence, the teaching of science to the majority of school population is to help the youth adjust to the product of science and technology that surrounds them.

The teacher serves as the most important science curriculum implementer in the classroom (Ume ,1983 and Aweh, 2004). Teachers all over the world are recognized as critical factors in the delivery of quality education at whatever level (Ike & Iheberenu, 2008). Becki (1983) opined that the successful attainment of the educational aspiration of any country depends on the inputs of its teachers. The recognition of the key role of teachers in any curriculum implementation has prompted several interaction studies in science classrooms in Nigeria (Adeniji, 1983; Okebukola, 1983; Eshiet, 1994; Salan, 1996; Nworgu , 1997; Awotua-Efebo, 2002; Effiong and Enukoha, 2004; Kalu, 2004 and Edu, 2006). These studies have all acknowledged a need for improvement in the level of abilities in teachers for them to be able to effectively teach, especially science in our schools.
Despite the emphasis on the importance of science education and the huge investments in Science by the government, performance of students in Science and Mathematics has been a source of concern to educational planners in Nigeria. If science is difficult to students, as indicated by consistent mass failures in the sciences, especially at the secondary level of education (Okpala, 1985; Adeniyi, 1986; Perterson, Mark & Clark, 1989; Aweh, 2004), it might be the fault of those who present it badly. Researches have been conducted to find out if the lack of understanding of underlying science concepts is a result of perception of difficulty of scientific concepts (Martins-Omole, 2002; Aweh, 2004; Njoku, 2004; Edu, 2006). For instance, in a study conducted by Edu (2006) on primary school teachers’ perception of difficult concepts, the result showed that teachers perceived twenty-two topics in the primary Science curriculum as significantly difficult.

Academic qualification is considered one of the predictors of teachers’ ability to understand and teach a subject effectively (Lingred, 1976). On his part, Watson (1990) pointed out that it is necessary for pupils to be given opportunities to study in the company of well qualified mathematics and science teachers. Similarly, educational qualification is said to be an important aspect of how a teacher perceives areas of difficulty in teaching (Uche and Umoren, 1998).

The gender schema theory states that an individual’s attention and behavior are guided by internal motivation to conform to gender-based socio-culture standards and stereotyped (Kelly, White & Small, 1984). Gender has also been noticed as having an important influence of both vocational and educational options and the ease or difficulty with which science is perceived (Ranner & Guyton, 1990). There is general believe among science educators that males perform higher than their female counterparts (Amara, 1985; Reigner, 1993; Enukoha, 1995). On the contrary, there also abounds evidence that gender disparity in science may not be attributed to ability but variables such as motivation, culture or other environmental and personal factors (Lingred, 1976, Akpan, 1987 and Slaven, 1996).

This study, therefore, aims to explore the influence of teachers’ academic qualification and gender on their perception of difficult concepts in primary science. Specifically, the study sought to find out:

1. If teachers’ academic qualification has any influence on their perception of difficult concepts/topics in Primary Science.
2. Whether gender affects teachers’ perception of difficult concepts in Primary Science curriculum.

The following hypotheses were formulated to guide the study:

1. Primary school teachers’ academic qualifications do not significantly influence teachers’ perception of difficult concepts/topics in Primary Science curriculum.
2. Primary school teachers’ perception of difficult concepts/topics in Primary Science curriculum is not significantly influenced by their gender.

Methodology

The expost facto or comparative design was used to investigate cause and effect relationship among the variables of the study. This research design is a systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable (Kelinger, 1986). The design helps this study to identify some existing consequences and set backs by analyzing data to establish possible causal factors for teachers’ perception of difficulty of science concepts/topics in Primary Science in the study area.

Population and sample

The population for the study consisted of 5,200 serving male and female primary school teachers in Ikom Educational Zone of Cross River State. The teachers possess a range of academic qualification from Teacher Grade II certificates to the Nigeria Certificate in Education (NCE), Bachelor of Education Degree (B.Ed) and Masters of Education Degree (M.Ed). Thirty three (33) out of three hundred and thirty three primary schools in the state, and 520 teachers representing 10% of the population were used as sample for the study. The distribution of the sample of the study, on local government basis, is presented in Table one.
Table one: Distribution of sample based on Local Government Area

<table>
<thead>
<tr>
<th>Local government</th>
<th>No. of schools sampled</th>
<th>No. of teachers sampled</th>
<th>% of the sampled teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abi</td>
<td>4</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>Boki</td>
<td>9</td>
<td>142</td>
<td>28</td>
</tr>
<tr>
<td>Etung</td>
<td>3</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>Ikom</td>
<td>6</td>
<td>94</td>
<td>18</td>
</tr>
<tr>
<td>Obubra</td>
<td>7</td>
<td>110</td>
<td>21</td>
</tr>
<tr>
<td>Yakurr</td>
<td>4</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>520</td>
<td>100</td>
</tr>
</tbody>
</table>

Instrumentation: A researcher designed instrument (Teacher Variables and Perception of Difficult Topics in Primary Science Inventory (TVPDTPSI) was used for obtaining data for analysis. The questionnaire consisted of a list of all the topics in Primary Science curriculum (62 items) measuring perception of difficult concepts/topics. The questionnaire had four (4) structured responses for each item. These are: Very Difficult (VD), Difficult (D), Fairly Difficult (FD), and Easy (E).

Analysis of data and Results

An analysis of the hypotheses was done and the results presented in tables.

Hypothesis one

This hypothesis states that “Primary school teachers’ academic qualifications do not significantly influence teachers’ perception of difficult concepts/topics in Primary Science curriculum.” The dependent variable in this hypothesis was teachers’ perception of difficult concepts in the subject, while the independent variable was teachers’ academic qualification. Data obtained were subjected to one way analysis of variance (ANOVA) test. The result of the analysis is presented in Table 2.

Table two: One way analysis of variance (ANOVA) of influence of academic qualification on teachers’ perception of difficult topic in Primary Science curriculum

<table>
<thead>
<tr>
<th>Qualification</th>
<th>N</th>
<th>x</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC.II</td>
<td>63</td>
<td>138.18</td>
<td>18.90</td>
</tr>
<tr>
<td>NCE</td>
<td>269</td>
<td>138.83</td>
<td>15.18</td>
</tr>
<tr>
<td>B.Ed</td>
<td>107</td>
<td>138.09</td>
<td>17.00</td>
</tr>
<tr>
<td>M.Ed</td>
<td>24</td>
<td>136.63</td>
<td>13.12</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>139.63</td>
<td>15.88</td>
</tr>
<tr>
<td>Total</td>
<td>482</td>
<td>138.52</td>
<td></td>
</tr>
</tbody>
</table>

Source of variance

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>Sum of square</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>256.91</td>
<td>4</td>
<td>64.23</td>
<td>.25</td>
<td>.961</td>
</tr>
<tr>
<td>Within Groups</td>
<td>121031.29</td>
<td>476</td>
<td>254.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>121288.20</td>
<td>481</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P < .05; Critical F = 2.39; df = 4, 476

From the result of Table two, it was observed that the calculated F-value of .25 is less than the critical F-value of 2.39 at .05 level of significance with 4 and 476 degrees of freedom. The result implies that academic qualification does not significantly influence teachers’ perception of difficult topics in Primary Science curriculum. The null hypothesis was therefore retained.

Hypothesis two

The null hypothesis states that “Primary school teachers’ perception of difficult topics in Primary Science curriculum is not significantly influenced by their gender. Teachers were classified into their gender and since the two groups
are distinct and independent, the independent t-test statistics was applied to test for significance. The results of the analysis are presented in Table three.

**Table three: Independent t-test analysis of the influence of gender on teachers' perception of difficult topics in Primary Science curriculum**

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>x</th>
<th>SD</th>
<th>t-cal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>197</td>
<td>139.03</td>
<td>17.02</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>285</td>
<td>138.18</td>
<td>1506</td>
<td>.56</td>
</tr>
<tr>
<td>Total</td>
<td>482</td>
<td>138.52</td>
<td>15.88</td>
<td></td>
</tr>
</tbody>
</table>

P > .05, Critical t = 1.96; df = 480

The result of analysis in Table three indicated that the male teachers had mean value of 139.03 and female teachers had mean value of 138.18 in their perceived level of difficulty of topics in Primary Science curriculum. The calculated t-value of .56 is less than the critical t-value of 1.96 at .05 level of significance with 480 degrees of freedom. This means that teachers' perception of difficult topics in Primary Science curriculum is not significantly influenced by their gender. The null hypothesis was therefore retained.

**Discussion of Findings**

**Academic qualification and teachers' perception of difficult topics in Primary Science curriculum**

The result of the analysis of hypothesis one indicated that academic qualification does not have significant influence on teachers' perception of difficult topics in Primary Science curriculum. Esu and Ntukidem (1977) contended that recruitment of teachers should not only be based on mere certificates but should be accompanied with an aptitude test. This goes to indicate that academic qualification alone does not really have much influence on a teachers' ability to teach the curriculum material. For effective science teaching therefore, academic qualification should be accompanied with aptitude and interest in the subject.

However, the result of this study disagrees with Jege (1992) who asserted that teachers with lower educational qualification will definitely implement the curriculum the wrong way because of their lower skills and experience. Also, Kimball (1989) stated that if it is desired that science teachers have better understanding of science, then consideration needs to be given to the inclusion of work towards that goal in the science teacher training programme.

Probably, the teacher training programme actually is focused on same topics not withstanding the academic level. Teachers with different academic qualifications therefore, may have similar understanding and perception of similar topics though trained at different levels. This may have brought about the disagreement of this study with various studies that advocate the importance of academic qualification to a teacher’s effectiveness.

Lack of significant relationship between teachers’ academic qualification and their perception of difficult topics in Primary Science could also be attributed to the nature of Elementary Education training programmes. The versatile nature of the training makes it difficult for any one teacher, no matter the level of qualification, to specialize in any specific area.

There is also the problem of the inclusion of very minimal science topics in elementary education teacher training programmes. Thus, there is no level of training that Science topics are adequately covered.

**Influence of gender on teachers' perception of difficult topics in Primary Science curriculum**

The results of the analysis of hypothesis two indicated that teachers' perception of difficult topics in Primary Science curriculum does not significantly depend on their gender. This result agreed with the opinion of Slaven (1996) that the differences between males and females in academic activities may be at least, in part, due to motivation. In their study, they showed that males as well as females read materials that they find interesting but were poorer in materials that did not interest them. They concluded that the tendency of females to have more difficulty than males
with problem solving tasks might also be a matter of motivation. Given equal motivation, cultural opportunities and academic conditions, both females and males are likely to perceive in similar terms.

Rudy (1982) concluded in a study that what is required of a teacher is the knowledge necessary to teach and not the gender. Also, Morgan (1978) maintained that neither males nor females are superior in overall intelligence. Oyedeji (1992) also discovered in a study that a teacher’s gender is not a factor in teaching, that other factors like environment, attitude and others also affect a teacher.

VonGlaserfeld (1993) concluded in a study that difficulties women have with problem solving are probably due to culturally determined attitudes and not lack of ability. The study further agreed with Akpan (1987) who concluded in a study that boys and girls would be equally successful in science if exposed to the same conditions. This result may therefore be attributed to the fact that both male and female teachers in Ikom Educational Zone may have found themselves under the same conditions and so are similar in their perception of difficult topics in the Primary Science curriculum.

In addition, primary school teachers have of recent been exposed to some in-service and refresher courses in preparation for the take-off of the Universal Basic Education (UBE) programme. Both male and female teachers were equally refreshed. This study was conducted immediately after this exercise. Hence, the lack of significant difference between males and females in their perception of difficult topics in Primary Science could be attributed to these refresher courses.

Conclusion

From the result of data analysis, the following conclusions can be drawn:

1. Academic qualification does not have a significant influence on teachers’ perception of difficult topics in Primary Science. This could be attributed to the nature of elementary education teachers’ training programmes that make no provision for specialization in any specific area of study.

2. Teachers’ perception of difficult topics in Primary Science does not significantly depend on their gender. Hence, perceived difficulty in science might not be a result of lack of ability based on gender.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Since the level of qualification does not influence the perception of difficult topics in Primary Science, planners of education should set a criterion, in addition to the academic qualification of teachers, for their recruitment, especially for the teaching of science. This could be by exposing the prospective teachers to an aptitude test in the sciences.

2. Both male and female teachers should be given equal exposure and opportunities for the learning and teaching of Science. Having known that level of perceived difficulty in the learning and teaching of Primary Science does not depend on gender, every measure should be taken to encourage both sexes in the understanding of science for the good of the scientific and technological future of the nation.

3. The annual teachers retraining programme of the Cross River State government should be sustained and the methodology of teaching perceived difficult concepts in science should feature prominently in the course content for such programmes.

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