Abstract

Federal Colleges of Education in Nigeria are the “train-the-trainer” colleges established to train and equip middle men power in Teacher Education. They offer a three-year Programme leading to the award of the Nigerian Certificate in Education (N.C.E), which is the minimum qualification for teaching in Nigeria. For some time now, there has been an alarming low participation in Mathematics and Science related courses when compared to Arts related course. In view of this, the study focuses on the analysis of students’ enrolment trend into Mathematics Education Programme in Federal Colleges of Education in Nigeria. The students’ enrolment data from the Colleges of Education Statistical Digest for 1999/2000 to 2007/2008 academic sessions have been used in this study. The analysis revealed a fluctuating pattern of enrolment into Mathematics Education Programme in Federal Colleges of Education, a wide gap between male and female students with male students dominating the Programme for all the academic sessions studied. Female students enrolment figure increases whenever male students enrolment increases and decreases whenever male enrolment figure decreases. Also, the study showed a significant difference between male and female enrolment in favor of male students. Based on the findings, the author made useful suggestions to increase enrolment, maintain a steady increase and bridge the wide gap in enrolment between male and female students in Mathematics Education Programme in Nigerian Federal Colleges of Education.

Keywords: Mathematics, Students, Colleges, Enrolment, Trend, Education, Nigeria.

The increasing importance and contribution of Mathematics Education to modern culture of Science and Technology for the development of any nation has been very well established and accepted universally. National development of any country is determined by the capacity of the nation to apply technology for the exploitation of the resources of nature, such exploitation of course rely heavily on Mathematics for the laying of the foundation for scientific and technological advancement. Ihejieto (1989), identified Mathematics as the ingredient for the effective articulation of the abstract elements of science that gives impetus to the development of technology. Jegede (1989) and Ali (1994) have also stressed that Mathematics is indispensable because it has substantial use in other human activities including school subjects. There could be no real development technologically without a corresponding development in Mathematics both as conceived and practiced (Ezeilo, 1975). Therefore, it is not a surprise to discover that the most effective and unparralled accomplished work of human being is found in his/her effort to utilize his/her Mathematical reasoning (Klin, 1980).

Mathematics is a discipline which permeates the entire activities of man and is such that anyone who understands mathematics will master every other school subject (Enukoha, 2010). She buttressed this by noting that Mathematics is a subject which requires a rigorous application of the human mind and if
this rigor is applied to any other school subject, the learner will succeed.

It is thus evident that performance in mathematics determines to a large extent performance in other subjects. Mathematics Education is a Programme run by Nigerian Colleges of Education, faculties of Education in Nigerian Universities, institutes of Education and School of Education in Nigerian Polytechnics. These Colleges, Institutions and Universities train Mathematics teachers who are regarded as professionally qualified teachers on completion of their Programme and so qualified to handle teaching and learning in Nigerian primary and secondary Schools.

Colleges of Education in Nigeria train middle manpower in teacher Education. They offer a three (3) year Programme leading to the award of Nigerian Certificate in Education (N.C.E). The philosophy of the Nigerian Certificate in Education (N.C.E) Mathematics Programme is inspired by the:
(i) desire to help students become intellectually informed in Mathematical ideas, notations and skills for logical reasoning, scientific enquiry and for the pursuit of techno-scientific education.
(ii) Need to produce non-graduates but well-groomed and qualified professional teachers of Mathematics for our primary and secondary schools (College Handbook, 2001). This provision is very essential because teachers are largely responsible for the translation of educational policies, curricular contents, instructional materials and packages as well as assessment of students’ learning outcome. The place of the teacher and teacher Education has been well established in the National Policy on Education document which states that “No Nation can rise above the quality of its teachers” (FRN, 2004). Despite the echo of Mathematics’ inevitable place in National Development, there is still an alarming rate of low enrolment into Mathematics Education Programmes in Nigerian institutions.

The inadequate teacher training and preparation as well as dwindling enrolment of pre-service teachers remain a big issue in the Nigerian Education system (Adeogun,1999; Maduewesi,2005).

Enrolment of undergraduate in Mathematics Education at Nigerian Colleges of Education and Universities is relatively low (Salman; Yahaya&Adewara,2011). Data presented in their study showed a dwindling trend in enrolment of students into Mathematics education. Over the years much emphasis has been made on the importance of Mathematics to National Development and the ways of improving the study at all levels Education have been suggested by researchers over the years. For the effective and meaningful learning of this subject, it is necessary that qualified teachers be involved and this can be achieved through the training in Colleges of Education.

Thus, this study is geared towards ascertaining the enrolment trend into Mathematics Education Programme in all the Federal Colleges of Education in Nigeria.

**Purpose of the Study**

This study is aimed at analyzing the enrolment pattern of students into Mathematics Education Programme in Federal Colleges of Education in Nigeria from 1999/2000 to 2007/2008 academic sessions. Specifically, the study was to:
(i) ascertain the enrolment trend into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions.
(iii) ascertain male students enrolment trend into Mathematics Education Programmes in
Research Questions
The following research questions were formulated to guide the study:
(i) What is the enrolment pattern into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions?
(ii) What is the pattern of female enrolment into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions?
(iii) What is the pattern of male enrolment into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions?
(iv) What is the pattern of female and male enrolment into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions?

Research Hypothesis
H₀: There is no significant difference between male and female enrolment pattern in Mathematics Education Programmes in Federal Colleges of Education for the period of 1999/2000 to 2007/2008 academic session.

Scope of the Study
The study covered all the Federal Colleges of Education in Nigeria. There are twenty-one (21) Federal Colleges of Education in Nigeria, one (1) Special, twelve (12) Conventional and eight (8) Technical all of them have a Mathematics Education Programme. The study is restricted to the trend of students enrolment into full-time Mathematics Education Programme in Federal Colleges of Education in Nigeria over the period of 1999/2000 to 2007/2008 academic sessions.

Research Method
The research method adopted for the study is the descriptive survey. The figures of enrolment was already in existence and not manipulated. The enrolment figures into Mathematics Education Programmes in Federal Colleges of Education in Nigeria for the period of 1999/2000 to 2007/2008 academic sessions were extracted from the Digest of Statistics on Colleges of Education in Nigeria. The data collected were analyzed using frequency count, percentages and chi-square.

Data Analysis
Research Question One: What is the Pattern of Enrolment into Mathematics Education Programme in Nigerian Federal Colleges of Education?
Data in table 1 shows that in 1999/2000 academic session, 3132 students enrolled into Mathematics Education Programme in Federal Colleges of Education. In 2000/2001 academic session, 3155 students enrolled into the Programme, giving a 0.73% increase from 1999/2000 enrolment figure. In 2001/2002 academic session, 5656 students enrolled into the Programme giving a 79.27% increase in enrolment from 2000/2001 enrolment. In 2002/2003 academic session, 7509 students enrolled into the Programme giving a 32.76% increase from 2001/2002 enrolment figure. In 2003/2004 academic session, 7696 students enrolled into the Programme giving a 2.49% increase from 2002/2003 enrolment figure. In 2004/2005 academic session, 6839 students enrolled into the Programme giving a 11.14% increase in enrolment from 2003/2004 enrolment. In 2005/2006 academic session, 4896 students enrolled, giving an increase of 28.41% from 2004/2005 enrolment figure. In 2006/2007 academic session, 5303 students enrolled into the Programme, giving a 8.31% increase from 2005/2006 enrolment figure. In 2007/2008 academic session, 5966 students enrolled into the Programme giving a 12.50% increase in enrolment from 2006/2007 enrolment. The percentage increase in 2007/2008 academic session when compared with 1999/2000 is 90.49%.

**Research Question Two:** What is the pattern of Female Enrolment into Mathematics Education Programmes in Federal Colleges of Education from 1999/2000 to 2007/2008 academic sessions.
Table 2: Female Enrolment Pattern into Mathematics Education Programmes in Nigerian Federal colleges of Education from 1999/2000 to 2007/2008 Academic Session

<table>
<thead>
<tr>
<th>Academic Session</th>
<th>'99/00</th>
<th>'00/'01</th>
<th>'01/'02</th>
<th>'02/'03</th>
<th>'03/'04</th>
<th>'04/'05</th>
<th>'05/'06</th>
<th>'06/'07</th>
<th>'07/'08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>969</td>
<td>991</td>
<td>1652</td>
<td>2322</td>
<td>2450</td>
<td>2300</td>
<td>1549</td>
<td>1620</td>
<td>1964</td>
</tr>
</tbody>
</table>

Source: Digest of Statistics on Colleges of Education.


The percentage increase in 2007/2008 academic session when compared with 1999/2000 is 102.68%.

Table 3: Male Enrolment Pattern into Mathematics Education Programmes in Nigerian Federal colleges of Education from 1999/2000 to 2007/2008 Academic Session

<table>
<thead>
<tr>
<th>Academic Session</th>
<th>'99/00</th>
<th>'00/01</th>
<th>'01/02</th>
<th>'02/03</th>
<th>'03/04</th>
<th>'04/05</th>
<th>'05/06</th>
<th>'06/07</th>
<th>'07/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>2163</td>
<td>2164</td>
<td>4004</td>
<td>5187</td>
<td>5246</td>
<td>4539</td>
<td>3347</td>
<td>3683</td>
<td>4002</td>
</tr>
</tbody>
</table>

Source: Digest of Statistics on Colleges of Education.

Data in table 3 shows that in 1999/2000 academic session, 2163 male students enrolled into Mathematics Education Programme in Federal Colleges of Education.

In 2000/2001 academic session, 2164 male students enrolled into the Programme, giving a 0.05% increase from 1999/2000 enrolment figure.

In 2001/2002 academic session, 4004 male students enrolled into the Programme giving a 82.03% increase in enrolment from 2000/2001 enrolment.

In 2002/2003 academic session, 5187 male students enrolled, giving an increase of 29.55% from 2001/2002 enrolment figure.

In 2003/2004 academic session, 5246 male students enrolled into the Programme, giving a 1.14% increase from 2002/2003 enrolment figure.

In 2004/2005 academic session, 4539 male students enrolled into the Programme giving a 13.48% increase in enrolment from 2003/2004 enrolment.

In 2005/2006 academic session, 3347 male students enrolled, giving an increase of 26.26% from 2004/2005 enrolment figure. In 2006/2007 academic session, 3683 male students enrolled into the Programme, giving a 10.04% increase from 2005/2006 enrolment figure.

In 2007/2008 academic session, 4002 male students enrolled into the Programme giving a 8.66% increase in enrolment from 2006/2007 enrolment.

The percentage increase in 2007/2008 academic session when compared with 1999/2000 is 85.02%.

Analysis of Students’ Enrolment Trend in Mathematics Education Programme in Nigerian Federal Colleges of Education

Table 4: Female and Male Enrolment Pattern into Mathematics Education Programmes in Nigerian Federal colleges of Education from 1999/2000 to 2007/2008 Academic Session

<table>
<thead>
<tr>
<th>Academic Session</th>
<th>'99/00</th>
<th>'00/’01</th>
<th>'01/'02</th>
<th>'02/'03</th>
<th>'03/'04</th>
<th>'04/'05</th>
<th>'05/'06</th>
<th>'06/'07</th>
<th>'07/'08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Female (%)</td>
<td>969 (30.94)</td>
<td>991 (31.41)</td>
<td>1652 (29.21)</td>
<td>2322 (30.92)</td>
<td>2450 (31.83)</td>
<td>2300 (33.63)</td>
<td>1549 (31.64)</td>
<td>1620 (30.55)</td>
<td>1964 (32.92)</td>
</tr>
<tr>
<td>Number of Male (%)</td>
<td>2163 (69.06)</td>
<td>2164 (68.59)</td>
<td>4004 (70.79)</td>
<td>5187 (69.08)</td>
<td>5246 (68.17)</td>
<td>4539 (66.37)</td>
<td>3347 (68.36)</td>
<td>3683 (69.45)</td>
<td>4002 (67.08)</td>
</tr>
</tbody>
</table>

Source: Digest of Statistics on Colleges of Education.

Data in table 4 shows that in each of the nine academic session studied, male students constitute above 66% of total enrolment figure while female constitute below 34%.

Hypothesis One: There is no significant difference between male and female enrolment pattern in Mathematics Education Programmes in Federal Colleges of Education for the period of 1999/2000 to 2007/2008 academic session.

Table 5: Comparison of Male and Female Enrolment Pattern into Mathematics Education programme in Federal Colleges of Education

<table>
<thead>
<tr>
<th>Gender</th>
<th>Observed Frequency</th>
<th>Expected Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>34335</td>
<td>34335.0</td>
</tr>
<tr>
<td>Female</td>
<td>15817</td>
<td>15817.0</td>
</tr>
<tr>
<td>Total</td>
<td>50152</td>
<td>50152.0</td>
</tr>
</tbody>
</table>

\[ X_{val}^2 = 37.972 > X_{tab}^2 = 15.507 \]

Table 5 shows a chi-square analysis of male and female enrolment pattern into Mathematics Education Programmes in Nigerian Colleges of Education. The table shows a calculated chi-square value of 37.972 and a tabulated value of 15.507 at 0.05 alpha level. This is an indication that there is a significant difference in male and female enrolment pattern into Mathematics Education Programmes in Nigerian Federal Colleges of Education in favor of male students.

Discussion of Findings

The study reveals a steady increase in enrolment from 1999/2000 to 2003/2004 academic session, a decrease in 2004/2005 to 2005/2006 sessions then an increase in 2006/2007 to 2007/2008 academic sessions. This is an indication that there was a fluctuating pattern in students’ enrolment into Mathematics Education Programmes in Nigerian Colleges of Education which confirms the findings of Adeogun (1999) and Maduewesi (2005) that there is a dwindling enrolment of preservice teachers.

The study also showed that for each academic session studied, male enrolment figure constitute above 66% while female enrolment figure constitute below 34%, out of a combined enrolment figure of 50152, male enrolment figure was 34335 representing 68.46% of total enrolment figure while female enrolment figure was 15817 representing 31.54% of total enrolment figure, giving a wide gap between male and female enrolment into Mathematics Education Programmes which confirms the assertion of Okebukola (2002) that
Science/ Mathematics related courses or discipline are “arid zones” for females. It also agrees with Kola and Akpotu (2004) findings that gap existed between female and male enrolment with low female enrolment in all Science-related courses in the Universities. This disparity could be associated to many factors as identified by researchers.

The study shows a relationship in male and female enrolment pattern. It shows that female enrolment figures increases whenever male enrolment figure increases and decreases whenever male enrolment figure decreases. This is an indication that the same factor influences both male and female enrolment pattern into Mathematics Education Programme. Similarly, male enrolment for each academic session lies between 66% and 80% while female enrolment lies between 29% and 33% which shows that the determinant of both male and female enrolment into Mathematics Education Programmes is constant.

The study also indicated a significant difference in male and female enrolment into Mathematics Education Programmes in favor of male students. This findings confirms Salman, Yahaya and Adewara (2011), that male undergraduates outnumbered their female counterparts in enrolment for Mathematics Education Programmes.

Conclusion

The study investigated the enrolment trend into Mathematics Education Programmes in Nigerian Federal Colleges of Education. Specifically, the study investigated the trend of enrolment into Mathematics education Programmes from 1999/2000 to 2007/2008 academic sessions. The findings of the study shows that very few female enrolled in Mathematics Education Programmes in Nigerian Colleges of Education, a very wide gap between male and female enrolment and male dominating the Mathematics Education Programme. It also reveals that female enrolment increases whenever male enrolment increases and decreases whenever male enrolment decreases. The enrolment trend between male and female students into Mathematics Education Programme showed a significant difference in favor of male students. The results of this study calls for an effective strategic approach in promoting female participation in Mathematics Education for National Development.

Recommendations

The following recommendations are made based on the result of the findings:-
1. The major cause of the continuous gap between male and female students enrolment in Mathematics Education should be identified through research.
2. Government, Non-Governmental Organizations and Women Organizations should provide scholarships and grants to female students in Mathematics Education.
3. Parents should be educated on the benefits of Mathematics and encouraged to help their female children develop interest for the subject.
4. Mathematics teachers at the Nursery, Primary and Secondary schools should be mentored from time to time about their central role in promoting the study of Mathematics.
5. A waiver in school fees for females who apply to study Mathematics should be made available at all levels of tertiary learning.
6. Counseling centers should be made available and functional in schools, professional councilors should be engaged in the services to provide guidance to female youths on carrier choice, relevance of Mathematics in National development and their role in National development.
7. Female students that perform well on completion of Mathematics Education Programme should be given automatic employment.
Analysis of Students’ Enrolment Trend in Mathematics Education Programme in Nigerian Federal Colleges of Education

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