ANALYSING GENDER REPRESENTATION IN PRIMARY, GRADE-V AND GRADE-VI MATHEMATICS TEXTBOOKS IN NIGERIA

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ABSTRACT

The study examines gender representation in primary 5 and 6 mathematics textbooks currently use in Federal Capital Territory (FCT) Abuja- Nigeria. Content Analysis approach that involves Descriptive Statistics tool was used to count the number of male and female characters, and gender neutral characters. The frequency and percentage of male and female gender characters, and gender neutral characters were calculated. The results revealed that there is gender bias representation of male characters than female in the two textbooks but more in primary 5 mathematics textbook. Based on the findings of the study, it was recommended that there is need to create awareness of existence of gender bias in mathematics textbooks through workshops and seminal for teachers, curriculum planner, policy makers and writers.

Keywords: Gender bias, Gender neutral character, Content Analysis, Gender representations, and Grades 5 and 6 Mathematics textbooks.

INTRODUCTION

Gender bias in learning materials such as textbooks has been a global issue in research over the years both in developed and undeveloped countries (Oyebola, 2003; Carthon, 2003; McDonnell, 2007; Plumm, 2008; Mustapha, 2012; 2013; Ghavbavi and Mousavi, 2012; Zilimu, 2014). Mathematics textbooks are important instrument in teaching and learning mathematics at all levels of education in Nigeria. They are used by both the teachers and the students, and the same time Mathematics textbooks are powerful representation of the curriculum and the pedagogical practices of education from primary to tertiary levels. It is revealed that Mathematics textbooks are embedded with gender discrimination in the form of stereotypical roles, omissions, or degradations (Moroava and Novotna,2013). Therefore, there is the need mathematics instructional materials should provide balance gender representation in illustrations and texts that will help male and females to relate to the material presented (Tietz, 2007). Gender biased representation in textbooks continue to exist despite the (CEDAW) condemnation of textbooks that are stereotypical on gender role (Mkuchu, 2004).

It is however sad to note that gender bias in school textbooks takes many forms and it is subtle and difficult to detect. It is embedded in the content of the texts and pictures (Bruegilles and Cromer,2009) It further creates and sustains a view of the world in which male activity and male persons are primary importance and of greatest value, while female activity and female persons are marginalised, made invisible or downgraded (Davies,1995).

Modibe (2012) argues that textbooks need to be reviewed with gender perspectives in order to provide balance and gender sensitive education to all children. He further emphasizes that authors of textbooks should be fully aware of the negative effects of stereotypes and gender bias to students when writing a textbook.

Students spend most of their lives in school using mathematics textbooks. They learn basic skills and also formulate attitudes and behaviour from what they have read in the textbooks. Sadker and Zittleman, (2007) found out that 75% of the child’s class work and 90% of the homework is from the textbooks and the teachers...
take their decisions from the textbooks (Baldwin 1992 cited in Blumberg 2007), and a pupil reads more than 32,000 pages of textbooks from elementary to high school level (Khurshi et al., 2010), in which they internalized what they read and see as suitable potentials and attitudes which are associated with being masculine and feminine through socialization within the family (Bahiyah et al., 2008).

Some scholars are of the same view as of Cameron that “a biased representation of female and male can lead to students’ sense of what is normal for women and men in the society, in other words, the content of the textbook helps reinforce gender as social division and perpetuate inequalities between men and women” (Gharbavi and Mousavi, 2012).

Some recent studies done on gender representation in the textbooks have not been given adequate attention by scholars. There is gender imbalance in science, technology and mathematics (STM) which is still reflecting in Nigeria. Blumberg (2007) observed that gender bias in textbooks and teachers' differential treatment of students have not been given adequate attention by scholars. Studies have shown that gender bias in textbooks may influence students' perception of who they are, how they should and may also affect their achievement and career choice (Carthon, 2003).

Statement of the Problem: Gender bias in school mathematics textbooks in Nigeria is of great concern to both mathematics educators as well as researchers. The “textbooks stand at the heart of the educational enterprise; teachers therefore rely on them to set the parameter of instruction to impact basic educational content” (Foulis, 2010). Gendered texts used by teachers make the students to feel that teachers are intentionally using the differences because of their gender (Deshler and Burroughs, 2013). Blumberg (2007) observed that gender bias in textbooks and teachers' differential treatment of students have not been given adequate attention by scholars.

Purpose of the Study: The purpose the study was to examine Primary 5 and 6 mathematics textbooks whether there is gender bias in male and female characters, and gender neutral characters. Also to create awareness to teachers on gender bias issues in learning materials which have negative impact on both male and female students (Cameron, 1990; Carthon, 2003; Hamilton et al., 2006).

Research question: How is gender represented in Primary 5 and 6 mathematics textbooks currently use in public schools in Nigeria in terms of male and female characters and gender neutral characters?

Methodology

In this study, two mathematics textbooks of primary 5 and 6 were used to determine whether there is gender
bias in male and female characters and gender neutral characters. These textbooks are the most frequently used in public primary schools in Federal Capital Territory (FCT) Abuja-Nigeria identified by Educational Research Centre (ERC) Abuja. The two textbooks Modular Mathematics for Primary 5, and MAN Primary Mathematics (Universal Basic Education Edition is written by different authors. Representation according to Jodelet, (1989) is a form of knowledge that is developed and shared socially with the practical aim, contributing to the construction of a reality common to social whole. Representation is not the reflection of reality. It reveals a shaping, an ordering of reality which aim not only to explain an established social order but also to legitimate it. (Brugeilles and Cromer, 2009). In this study, Content analysis approach was adopted which involves descriptive Statistical of frequency and percentages. Content analysis simple means what is content in a message. It is seen as a method in which content of message form the basis for drawing inferences and conclusion about content (Nachmias and Nachmias, 1976).

**Data Analysis:** The data analysis included tallies for existence and frequency of gender characters and gender neutral, were calculated as the number of occurrence per module by unit of mathematics textbooks and percentage was calculated. The modular mathematics textbook of primary 5 used in FCT Basic primary schools has 30 modules of which 19 representing 63.33% of the modules do not have human characters in the texts while 11 (36.67%) modules have human characters. This means that the greatest part of the mathematics text book does not contain human characters. Each of the modules was examined for male, female and gender neutral characters in the text to ascertain the extent of gender inequity. The results of the analysis are presented in Tables 1.

**Table 1. Summary results of Gender bias Modular Mathematics for Primary 5 Revised Edition.**

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
<th>Frequency and percentage of individual and collective characters in the text</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>%</td>
</tr>
<tr>
<td>Module 3</td>
<td>Decimal fraction</td>
<td>14</td>
<td>53.85</td>
</tr>
<tr>
<td>Module 4</td>
<td>Percentages</td>
<td>12</td>
<td>50.00</td>
</tr>
<tr>
<td>Module 5</td>
<td>Ratio</td>
<td>15</td>
<td>45.45</td>
</tr>
<tr>
<td>Module 6</td>
<td>Addition and Subtraction</td>
<td>14</td>
<td>45.16</td>
</tr>
<tr>
<td>Module 9</td>
<td>Division</td>
<td>5</td>
<td>41.67</td>
</tr>
<tr>
<td>Module 11</td>
<td>Ratios and percentage revision</td>
<td>16</td>
<td>55.17</td>
</tr>
<tr>
<td>Module 12</td>
<td>Simple problems on percentages</td>
<td>21</td>
<td>60.00</td>
</tr>
<tr>
<td>Module 13</td>
<td>Open sentence</td>
<td>3</td>
<td>50.00</td>
</tr>
<tr>
<td>Module 14</td>
<td>Money</td>
<td>25</td>
<td>69.44</td>
</tr>
<tr>
<td>Module 19</td>
<td>Weights</td>
<td>3</td>
<td>17.65</td>
</tr>
<tr>
<td>Module 20</td>
<td>Average speed</td>
<td>15</td>
<td>60.00</td>
</tr>
<tr>
<td>Grand total</td>
<td></td>
<td>143</td>
<td>51.19</td>
</tr>
</tbody>
</table>

**Source:** Modular Mathematics for Primary 5 (2010) consisted of 45.45% of male characters, 42.42% female characters and 12.12% neutral characters. We concluded that gender inequity manifested in the module in favour of males. Analysis of module 6 on the topic addition and subtraction indicated that 14 characters representing 45.16% of male, 32.26% female characters and the rest 25.58% for gender neutral characters were used.

It is important to note that in Module 9 the results show that neutral characters in the text are predominately
with 50% while 41.67% and 8.33% represents male and female characters respectively. We can conclude that there is gender equity in this very particular modular out of 11 modules that have human characters. The results of analysis of module 11 shows 55.17% of male character in the text, 27.59% of female characters while 17.24% of neutral characters. It can be concluded that the module is dominated by male character than female characters and it uses few gender neutral characters. This mean there gender inequity in the module.

Analysis of module 12, shows that 60%, 8.57% are male and female characters respectively, while 31.43% gender neutral characters. It can be concluded there is no gender equity. This mean that male characters are the dominate of the module in the texts. Also 50% of male characters, 33.33% of female characters are present in the text while there is 16.67% of gender neutral character. This means gender inequity is manifesting in favour of the male characters.

The results of the analysis of module 14 and 19 shows that 69.44%, 17.65% representing male characters, 8.33%, 47.06% representing female characters in modules 14 and 19. While 22.22% 35.29% are gender neutral characters for the two modules. The last module has more gender neutral characters than the first. It means that gender inequity is manifesting in the two modules only that gender neutral characters are more in the second module than the first.

The topic on average speed in module 20 indicated that 60% male characters, 16% female characters while 24% representing gender neutral characters in the texts of the last module that have human characters. This however mean that male characters are the dominate and which implies that gender inequity is manifesting.

Table 2 shows the number of frequencies of gender bias in characters of males, female and gender neutral that is contains in Grade 6 MAN Primary Mathematics textbook of Grade 6 used in FCT primary schools. It has 28 modules of which 16 (57.14%) which representing human characters in the text while 12 (42.86%) modules do not have human characters. This means that the greatest part of the mathematics text book contains human characters. Each of the modules is examined for male, female and gender neutral characters in the texts to ascertain the extent of gender inequity. The results of the analysis are presented in Tables 2.
The results of modules 20 and 22 analysis indicates that 12 (92.31%); 5 (100%) representing males characters, 1 (7.69%) female characters. This means there is gender bias in favour of males in both modules. In the same manner, the modules of statistics 1 and 2 shows that 15 (41.67%); 4 (22.22%) males characters, 12 (33.33%); 2 (11.11) females characters and 9 (25%); 12 (66.67%) gender neutral characters in the texts. This means gender inequity is manifesting in favour of males and to some extent gender neutral characters are used.

Table 2 analysis shows that, 246 (62.44%) representing male characters while, 68 (17.26%) representing females characters and 80 (20.30%) representing gender neutral characters used in MAN Primary Mathematics Book 6 in the texts. This shows that there is gender bias in the textbook in favour of male characters. Furthermore, the pattern shows gender bias increases as the students move from low level to high level of class. The reason can be that as the students becoming more mature, gender inequity in the texts may not have negative effect on their interest and attitude in mathematics in respective of gender used in the text.

**DISCUSSIONS**

The results in Tables 1 and 2 revealed there is gender bias representation in the mathematics textbooks which is in line with the results of Oyebola, 2003, Tietz, 2007; Mustapha, 2012, 2013; Habiba Binti Ismail et al., 2011; Bahiyah et al, 2008 which is in favour of male characters. These results are from subjects such as English language, Social studies, Accountancy, primary science textbooks. But on the other hand the findings are contrarily to the findings of Carthon (2003). However, it is interesting to know that the pattern shows gender bias in favour of male characters increase as student move primary 5 to 6. The reason may be that the students are becoming more mature and so the gender bias representation in mathematics textbooks may not have any negative impact on mathematics achievement and career choice related to mathematics.

**CONCLUSION AND RECOMMENDATIONS**

The present study findings are similar to the most recent findings of content analysis on gender characters and gender roles in English Language, Social Studies, and Science and Accounting textbooks used by other scholars. Further study could examine the gender representation in primary 3 and 5 mathematics textbooks.
REFERENCE


