GENDER AND SELF-CONCEPT AS A FACTOR INFLUENCING ACADEMIC ACHIEVEMENT OF ADULT LEARNERS IN MATHEMATICS AMONG POST-LITERACY LEARNERS

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Abstract

The study investigates gender and self-concept as correlates of academic performance among post-literacy learners in Mathematics. The ex-post factor design was adopted for the study. Simple random sampling was used to select 168 clienteles from 56 post-literacy centers in Kano metropolis. Of the total sample, 100 were male while 68 were female. Three instruments were used for the purpose of this research work. The instruments were adult learners' achievement test, facilitators questionnaire and Rosenberg self concept scale. The result indicated that there is significant gender difference in the academic performance of post-literacy clienteles and there is significant effect of self-concept among post-literacy clienteles in Mathematics. Based on the findings it is suggested that adult learners' facilitators should always motivate and encourage the clienteles during facilitation and also there should be counselling in order to develop the adult learners' interest in Mathematics.

Introduction

Mathematics is a discipline that characterizes the modern world and is the most central among all discipline in all school system. It is a basis of modern scientific and technological development and an important means of cogent, concise and unambiguous communication (Cockcroft, 1982, Ndimbiwe, 1995). However, in recent years with the quest for universalization of Basic Education and the need to meet Education for all agenda, most of the developing countries realize the significance of mathematics in adult learning and the role played by the knowledge of mathematics in all fields of human endeavor.

The importance of mathematics is invaluable because knowledge of mathematics plays a fundamental role in promoting logical and rational thinking and enhancing abilities to analyze and solve problems. Aderinoye (2004) noted that numeracy (mathematics) is a necessity in every society that adopts activities as part of their life among which are measuring and weighing. Corroborating this, Eze (2005) noted that mathematics helps to prepare learners for
life and help them to acquire the skills they need in order to become efficient and effective in problem solving and in everyday life calculation.

The achievement of students/learners has been a source of great concern for educators, parents, guardians, curriculum planners and researchers. This general concern stems from prevailing poor achievements recorded by students almost each succeeding year (Ezeazor, 2003). The poor performance/achievement in general subjects (English and Mathematics) at secondary school level over the years is no more hidden (Akinsola, 1994).

There are numerous factors influencing academic achievement. These include; school quality, teacher quality, school environment, and provision of resources (Obomeata, 2001; Awoyemi, 1986). Research findings show that individual characteristics such as motivation, orientation, self-esteem, self-efficacy and learning approaches are important factors influencing academic performance (Minneart and Jasen, 1992; Watkin, 1986). The relationship between mathematics self-concept and mathematics performance/achievement is another area that has been investigated by researchers (Marsh, 1992; Hamachek, 1995 cited by Kiamanesh, 2001). Franken (1994) states that ‘there is great deal of research which shows that self-concepts is perhaps the basis for all motivated behavior’. It is self-concept that gives rise to possible selves, and it is possible selves that create the motivation for behavior (p. 443). According to Wilhite (1990) most findings in this area showed that those who have higher self-concept have higher scores in mathematics. Corroborating this Helmke and Aken (1995) stated that self-concept has been found to be a contributor to an individual’s academic achievement. In another research carried out by Ekpeyoung (1989) on the influence of self-perception on academic achievement, he concluded that self-concept significantly influences students’ academic achievement. Adedipe (1986) cited by Abdullahi (2007), reported that relationships exist between self concept and achievement in Mathematics and English language among senior secondary school students. To corroborate the above, Aremu and Oluwole (2001) and Wuensch and Lao (2001) have established that the way and manner the learner perceives himself could affect his academic performance. Supporting this Adeyemo and Torubeli (2008) concluded that self-efficacy, self-concept and peer-influence, are effective in predicting academic performance of senior secondary school students. This means that learners with high self-concept will try harder to master challenges while a sense of low self-concept contribute to anxiety and negative thinking, and this will affect the performance of learners in mathematics. One can conclude that the success or failure a learner may experience in mathematics could be attributed to the effort the learner makes in order to learn mathematics at school, or do home work at home.

Research has for a long time examined the phenomenon of sex differences in education but in most mathematics and mathematics related fields there tend to be more males than females. Could it be that gender is the determinant of mathematics achievement? Many researchers from parts of Nigeria have concluded that male students perform and achieve better than
female students in mathematics and mathematics related fields (Onabowale, 1982, Akinkihuli 1982, Oyedekum 1983) cited by Abdullahi (2005). In their research Obioma and Ohuce (1980) cited by Abdullahi (2005) concluded that male achievement is significantly higher than female achievement in mathematics. Moreover, a study carried out at the International Center for Educational Evaluation (ICEE, 1985) indicated that male consistently perform better than female at basic education level. Uffort and Awuwoloye (1987) found that Nigerian girls under achieve relative to the boys in basic science and particularly so in mathematics. Olagunji (2002) concluded that the performance of students in mathematics does not depended on their sex. Abdullahi (2007) opined that female poor performance in mathematics is as a result of people’s conclusion that mathematics is difficult, more mental demanding as it involves much thinking and it does not form part of what women should engage in. Supporting this, Bello (1999), states that more boys choose mathematics and mathematics related fields than girls in high schools. Similarly, Balogun (1985) indicated that more males than females are favorably disposed to science and mathematics and their performance differ in mathematics. Trelan (1989) noted that though females in lower classes seem just as interested as males in computer, these changes from the age of 10 to 11 and from then on, more males than females use micro-computer. Since mathematics and computer could be said to be twin sisters, one may be tempted to conclude that such a trend might equally describe the behavior to, the achievement of females.

Purpose of the Study
The purpose of this research is to find out the effect of gender and self-concept on the performance/achievement of post literacy clienteles in mathematics.

Research hypothesis
Ho; There is no significant effect of self-concept on the academic achievement of post-literacy learners in mathematics.
Ho; There is no significant effect of gender on the academic performance of post-literacy learners in mathematics.
Materials and method
The research design is ex-post factor design. The research is the collection and administration of data without treatment. The population of this study consisted of post-literacy clienteles and facilitators in the literacy centers in Kano metropolis. The sample of this study consisted of 168 clienteles randomly chosen from 56 post-literacy classes in the literacy centers in Kano metropolis. One hundred and sixty eight (168) clienteles were randomly selected out of which one hundred (100) were male and sixty eight (68) were female.

The researcher constructed two instruments i.e. Adult learners’ achievement test in mathematics and Facilitators questionnaire and adopted Rosenberg Self-concept Scale. The adult learners’ achievement test was made up of fifteen multiple choice test items with four
options while the questionnaire was made up of twelve items. The questionnaire was aimed at finding the views of the facilitators with regard to their perception of the factors influencing adult learners’ performance/achievement in mathematics. The scripts were collected and marked. The data collected were subjected to t-test, analysis of variance and tukey post-hoc test analysis.

Table 1 Sample Distribution

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Number</th>
<th>Number Sampled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clienteles</td>
<td>1680</td>
<td>168 (10%)</td>
</tr>
<tr>
<td>Facilitators</td>
<td>56</td>
<td>16 (29%)</td>
</tr>
<tr>
<td>Total</td>
<td>1792</td>
<td>184 (17%)</td>
</tr>
</tbody>
</table>

Results

Ho: There is no significant effect of self-concept on academic achievement of post-literacy learners in mathematics.

The hypothesis was tested using analysis of variance (ANOVA) and the results are presented in table 1 below:

Table 2: Analysis of Variance summary in difference of self concept by academic achievement

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>FCal</th>
<th>Fcritical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>10349.849</td>
<td>2</td>
<td>5174.924</td>
<td>23.407</td>
<td>3.84 (.05)</td>
</tr>
<tr>
<td>Within Groups</td>
<td>36257.504</td>
<td>164</td>
<td>221.082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46607.353</td>
<td>166</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation

The results from table 4.3 show that there was significant effect of self-concept on academic achievement of post-literacy clienteles in Kano metropolitan (the Fcal is 23.407 and the critical F is 3.84 at 5 percent level of significant). Therefore, the null hypothesis is hereby rejected.
In addition, the post hock analysis using Turkey’s test shows that sample with high self-concept had higher mean score in academic performances (i.e 48.03), this is followed by medium self concept (i.e.32.45) and lastly those with low self-concept (i.e 31.38) respectively.

**Table 3: Post hock Analysis of mean differences in Self-concept**

<table>
<thead>
<tr>
<th>Self concept</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Tukey HSD&lt;sup&gt;a,b&lt;/sup&gt; Low Self concept</td>
<td>32</td>
<td>31.3750</td>
</tr>
<tr>
<td>Medium Self-concept</td>
<td>65</td>
<td>32.4462</td>
</tr>
<tr>
<td>High Self-concept</td>
<td>70</td>
<td>48.0286</td>
</tr>
<tr>
<td>Sig.</td>
<td></td>
<td>.932</td>
</tr>
</tbody>
</table>

**Table 4: T-test summary of difference in gender by academic achievement**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean(X)</th>
<th>N</th>
<th>S.D</th>
<th>SE</th>
<th>t&lt;sub&gt;Cal&lt;/sub&gt;</th>
<th>T&lt;sub&gt;Crit&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30.42</td>
<td>100</td>
<td>16.54</td>
<td>1.66</td>
<td>18.2</td>
<td>1.97(.05)</td>
</tr>
<tr>
<td>Female</td>
<td>17.83</td>
<td>68</td>
<td>2.08</td>
<td>.20</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Significant**

**Interpretation**

The results from the table shows that the t<sub>cal</sub> is 18.24 and the critical is 1.97 at 5 percent level of significant. Therefore, the null hypothesis is hereby rejected. In other words there is significant gender difference in the academic achievement of post-literacy learners in mathematics in Kano Metropolis. The result further shows that male performed better in Mathematics than females.

**Table 5: Summary of facilitators’ questionnaire on the factors influencing academic achievement of the clientes**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following factors influence academic achievement of clientes in mathematics, thus:</td>
<td>Agree</td>
</tr>
<tr>
<td>Age</td>
<td>45%</td>
</tr>
</tbody>
</table>
Gender | 65% | 35%
---|---|---
Clientele’s interest | 75% | 25%
Nature of the subject | 45% | 55%
Facilitation approach | 70% | 30%
Learning environment | 75% | 25%
Occupation/Social status | 75% | 25%

Similarly, the analysis of the facilitators opinion on the factors that promote the academic achievement of adult learners in mathematics indicated that forty-five percent (45%) of the facilitators believed that age has effects on the achievement of adult learners in mathematics, also another fifty-five percent (55%) were of the view that age has no effect on the academic achievement of adult learners in mathematics. On gender difference and academic achievement, 65% of the facilitators were of the view that gender has an effect on the academic achievement of the adult learners in mathematics while 35% were of the opinion that gender has no effect on the academic achievement of adult learners in mathematics. More so, the analysis also revealed that clienteles’ interest, facilitation approach, learning environment and occupation/social status have effects on the academic achievement of adult post-literacy learners in mathematics. This is evidenced with 75%, 70%, 75% and 75% respectively.

**Discussion**

The finding of the study revealed that there is significant effect of self-concept on academic achievement of post-literacy learners in mathematics. This is in line with the findings of Helme and Aken (1995) which stated that self-concept has been found to be a contributor to individual’s academic achievement. Corroborating this Wilhite’s (1990) findings in this area showed that those who have higher self-concept have higher scores in mathematics. Similarly, Helme and Aken (1995) opined that self-concept has been found to be a contributor to an individual’s academic achievement. Supporting the finding, Torubeli (2008) found that relationships exist between self concept and academic achievement. Ekpeyoung (1989) discussed the influence of self-perception on academic achievement and concluded that self-concept significantly influences students’ academic achievement. Adedipe (1986), reported that relationships exist between self concept and achievement in Mathematics among students. This shows that learners with high self-concept performed better than those with low self-concept.

The finding of the study shows that there was a significant gender difference in academic achievement of post-literacy learners in mathematics in Kano Metropolis. This may be due to the perception that Mathematics is difficult and is more of a masculine subject.
Corroborating this, Bello (1999) stated that male choose mathematics and mathematics related fields and performed better than females. Similarly, Abdullahi (2007) concludes that female poor performance in mathematics could be related to the perception held that mathematics is difficult, demands more mentally as it involves much thinking and does not form what females should engage in. This is in line with the findings of Obioma and Ohuce (1980) which concludes that male achievement is significantly higher than female achievement in mathematics. Finally, the study revealed that there is significant gender difference and self-concept in academic achievement/performance of post-literacy learners in Kano metropolis.

**Conclusion**
Mathematics is a subject that characterizes the modern world; it forms the basis of modern scientific and technological developments. The increasing need for mathematical skills in all aspects of adult life, employment, community has made mathematics a requisite skill for success in today’s society. The outcome of the tested hypotheses revealed that there is significant gender difference in the performance of adult post-literacy learners in mathematics. Similarly it was found that there is significant effect of self-concept on the academic achievement of post-literacy learners in mathematics.

**Recommendations**
Based on the result of this study, the following recommendations are necessary:

i. Adult post-literacy learners should be exposed to the counseling interventions geared towards self-concept. This attribute when developed can have salutary effects on the learners’ performance in mathematics.

ii. Facilitators should always encourage adult post-literacy learners during facilitation and show them the importance of mathematics in everyday life, and that they can perform well regardless of their socio-economic status.

iii. Adult post-literacy learners should be helped by improving upon both facilitation approach and instructional aids in order to improve their performance in mathematics.
References


