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## Gender Inequality in Chemistry Achievement: Does Instability in Marital Homes Contribute to it?

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By

DR. JOSEPH O. AKPAN  
*Department of Chemistry  
Federal College of Education,  
Zaria  
Kaduna State.*

**And**

DR. ALBERT U. ARCHIBONG  
*Department of Integrated Science  
College of Education,  
Afaha Nsit  
Akwa Ibom State.*

### **Abstract**

*This study investigated gender inequality in chemistry achievement against the background of marital home background environment of students' parents. Two instruments: Marital Home Background Environment Questionnaire (MHBEQ) and Published Terminal Examination Results (PTER) were used for the study. Two intact classes of 74 SS2 chemistry students from one senior secondary school in Kaduna South LGA of Kaduna State were trial-tested with MHBEQ. On the basis of the subjects' responses, they were classified into stable and unstable marital homes. The students were subsequently matched with their academic achievements as measured by their Published Terminal Examination Results. Data analysis of the published results using means, standard deviations and t-test comparison of means revealed that students from stable marital homes achieved significantly better than those from unstable marital homes. The male students from stable homes achieved significantly better than the female students from unstable homes just as the female students from stable home excelled significantly better than their male*

*counterparts from unstable homes. In line with the findings of the study, recommendations are proffered.*

Gender inequality is both a national and an international issue that has received much attention in contemporary scientific literature. However, the discussion on gender has remained inconclusive. Regarding gender inequality in science achievement, Inyang and Jegede (1991), Shaw and Doan (1995), Raimi (2002), Afuwape and Olupide (2008) and Ogunleye and Babajide (2011) noted that both males and females achieve equally in science. But Catsambis (1995), Shaibu and Mari (1997) and Ahiakwo (1998) reported of inequality in gender achievement in favour of the females who, they argued, achieved significantly better than their male counterparts. However, researchers such as Trigwell (1990), Okeke (1997), Erliymaz (2002), Adesoji and Babatunde (2008) observed gender disparity in science achievement in favour of the male folks. The issue of gender disparity is an contentious as the interpretation of its cause(s). Eze (2007) in his opinion believed that gender stereotyping (collection of commonly held beliefs or opinion about what behaviours are appropriate or inappropriate for males and females) appears to be the most predominant and perhaps the source of other causes of gender differences in science education. Using statistical model, Walding (2002) showed that the inequality is due to sex-role orientation and sex-correlated differences in science-related interests. Walding (2002) explained his assertion with regards to chemistry thus:

*“Many students engage in activities, interests and Sports that provide them experiences relevant to Science. Such experiences are likely to result in an incidental knowledge and understanding of those domains that the students might otherwise not possess. Sex differences in these science-related experiences may be associated with sex differences in incidental learning and ultimately with performance on formal chemistry tests. A student’s sex-role orientation, irrespective of biological sex, may also influence his/her experiences of the world...”*

In the views of Hazari and Potvin (2005), gender disparity can be experienced by three factors namely, inherent (biological) differences, sociological differences and cultural bias between the sexes. However, Norwell and Hedges (1998) in Walding (2002) are of the opinion that the progressive changes in girl/boy relativities suggest that much of the sex difference in cognitive performance goes beyond biological factors. The present study is positioned on this literature – trying to find out other non-biological factors (e.g marital home background situation of students’ parents) to interpret gender disparity in chemistry achievement.

The vital role of home environment as one of the most powerful determinants of variability in educational progress among students has been recognized by educators, sociologists and psychologists for a very long time (Nwosu & Maduewesi, 1980;

Iverson & Walbery, 1982). Available literatures on home background factors and students' achievement tend to dwell more on socio-economic status and level of education of parents. Such are the studies by Fakuade (1979), Chacko (1981), Osafehinti (1984), Udokpong (1991) and Akpan (1991).

Information, therefore, seem to be lacking on marital home background factors and students' achievement with respect to chemistry. This study therefore sought to fill the gap by giving answers to the following questions:

- i Does the academic achievement of chemistry students from unstable marital homes differ from that of students from stable marital homes.
- ii Does the male students' academic achievement in chemistry differ from that of their female counterparts with respect to their marital home background conditions?

**Accordingly, the Following Null Hypothesis were Tested**

- i There is no significant difference between the academic achievement of chemistry students from stable marital homes and those from unstable marital homes.
- ii Male students' academic achievement in chemistry does not differ significantly from that of their female counterparts with respect to their marital home background condition (stable or unstable).

**Methodology**

The design used for this study was ex-post-facto research design as the study sought to find out the effects of what had already happened using variables that could not be manipulated. It was a pilot study conducted with 74 SS2 chemistry students using two intact arms of one senior secondary school in Kaduna South LGA of Kaduna State. Two instruments: Marital Home Background Environment Questionnaire (MHBEQ) and Published Terminal Examination Results (PETER) were used to gather data. The MHBEQ was an eight item questionnaire that sought information from the students regarding their sex, name and the marital home background conditions of their parents. These included whether their parents are still alive and are frequently involved in fighting or are dead, separated/divorced or remarried to other parents, etc. Students who responded to the questionnaire item with reports of cases of death of parents, divorce or parental separation or frequent fightings among parents were judged to be from unstable home while those whose responses showed no such reports were judged to be from stable homes. The names of the students on the MHBEQ were used to trace their academic achievement from the academic records of their Published (third) Terminal Examination Results.

The Questionnaire instrument was validated by experienced chemistry and educational psychology university lecturers, and the reliability of the instrument using test-result method was 0.68. Although, 47 students were matched with stable homes while 27 were matched with unstable homes. The means and standard deviations of the third terminal examination scores of the students in chemistry were analyzed and used to answer the research questions while t-test comparison of the means was to test the null hypothesis at 0.05 probability level. The results are presented in Table 1 and 2.

**Table 1: Results of T-Test Analysis of Academic Achievement of Students from Stable and Unstable Homes**

<b>Group</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>t-value</b>
Students from stable homes	47	56.79	10.26	
Students from unstable homes	27	42.30	9.80	6.18*

\* Significant at 0.05 probability level

The results of the analysis shows that students from stable homes have higher mean score in their terminal chemistry examinations than those from unstable homes. There is therefore a significant difference between the academic achievement of students from stable marital homes. The null hypothesis is therefore rejected. Hence students from stable marital homes achieved significantly better than those from unstable marital homes.

**Table 2: Gender Analysis of Academic Achievement with Respect to Home Marital Condition of Students**

<b>Group</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>t-value</b>
Male students (stable homes)	12	56.08	10.15	
Female students (unstable homes)	13	41.23	9.17	3.85*
Male students (unstable homes)	14	42.93	9.80	
Female students (stable homes)	35	57.60	9.95	4.68*

\* significant at 0.05 level

The results of the analysis show that irrespective of gender, students from stable marital homes differ in their academic achievement from those from unstable marital homes. From Table 2, male students from stable homes achieve significantly better than their male folks from unstable homes. Equally, the female students from stable homes achieve significantly better than those of them from unstable homes. The males from stable homes performed significantly better than the females from unstable

homes while the females from stable homes equally demonstrated significantly better achievement than their male counterparts from unstable homes.

## **Discussion**

From the findings of this study, it is evident that marital home background factor has a part to play in variability of educational progress among students. This finding is consistent with Norwell and Hedges (1998) in Walding (2002) that much of sex difference in cognitive achievement goes beyond biological (inherent) factors. The findings of the study that male students from stable homes achieved significantly better than the female students from stable homes while the female students from stable homes excelled significantly more than their male counterparts from unstable homes lend credence to the recent findings of Ogunleye and Babajide (2011) that the era of male supremacy and dominance over females is fast winding up. It is therefore, believed that both if male and female students are brought up under suitable and favourable home background environment free from emotional imbalance, they will compete equally and favourably in their academics.

## **Conclusion and Recommendations**

The results of this study show that inequality in chemistry achievement though it exists does not depict male supremacy and dominance over the females. As can be seen in the study, the marital home background environment of the males can make them dominate in achievement over the females just as the same condition can also cause the females to surpass the males in achievement. Therefore, the generally held notion of superiority of males over females should be discarded. In line with the study it recommended that:

- i Parents should endeavour to rear their children under good home environments devoid of fighting, divorce, parental separation and marrying and remarrying. This will keep the children in sound emotional state to learn better.
- ii Morally, spouses should be faithful to their marital vows/partners as unfaithfulness would lead to friction in their families with transferred effects on their children.
- iii Sex-role stereotyping in schools should be discouraged as much as possible.

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