A COMPARATIVE STUDY OF MATHEMATICS ACHIEVEMENT OF JUNIOR SECONDARY SCHOOL STUDENTS FROM DIFFERENT FAMILY BACKGROUNDS IN AGBANI EDUCATION ZONE OF ENUGU STATE

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Abstract

The purpose of this study was to compare the mathematics achievement scores of junior secondary school students from different family backgrounds in Agbani education zone of Enugu state. Causal comparative or expost facto research design was adopted for the study. Four research questions and four hypotheses guided the study. Proportionate stratified random sampling techniques was used to draw 200 Junior Secondary three (JSS 3) students from three secondary schools in Agbani Education Zone, one from each of the three local government areas that make up the zone. Two instruments, a questionnaire on family backgrounds of secondary school students in Agbani Education Zone, and a form for students' mathematics achievement scores were used for data collection. The questionnaire was used to collect data on the students' family backgrounds while the form was used to collect data on the students' mathematic achievement scores from records and vital documents in their schools. Data collection was personally undertaken by the researcher who visited the schools and administered the instruments. Mean and standard deviation were used to answer the research questions while one-way analyses of variance (ANOVA) was used to test the hypotheses at 0.05 level of significance. Major findings of the study revealed that family backgrounds have significant influence on the students mathematics achievement scores. It was recommended among other things that the government and other secondary school proprietors should organize periodic seminars and capacity building workshops for secondary school teachers on how to handle the individual differences among students from diverse backgrounds in their teaching.

Introduction

The family is a basic unit of the society and it is seen as the bedrock or the corner stone of the society. The family could be either nuclear (parents and children) or extended encompassing other relatives). According to Ekpe

(2014), family is defined as a group consisting of one or two parents and their children. Family is a universal and multi-functional institution even in highly developed societies. It is a coordinating agency even in advance societies. All social and cultural practices find their connection with a notion of family, either supporting or distorting it. According to Oduma (2015), the word "family" has its origin in the Latin word which could be translated to mean "domestic group". A domestic group is a group of people who habitually share a common dwelling and common food supply. Traditionally, family is defined as a minimal effective group of relatives by blood and/or marriage and analogous group (Perez, 2016). By analogous groups, Perez meant those members who are related by blood or marriage, e.g. adopted children. Murray (2015) defines family as a group of people affiliated by consanguinity (by recognized birth), affinity (by marriage), or co residence shared consumption. As the basic unit for raising children, Anthropologists most generally classify family organization as matrifocal (a mother and her children), conjugal (husband, his wife and children, also called nuclear family), avunclular (a brother, his sister and her children); or extended family in which parents and children co-reside with other members of one parent's family (Murray, 2016). Family is used metaphorically to create more inclusive categories such as community, nationhood, global village and humanism.

According to Haske (2014) one of the primary functions of the family is to produce and produce persons, biological and/socially. This can occur through the sharing of material substances (such as food); the giving and receiving of care and nurture (nurture kingship); jural right and obligations and moral and sentimentalities. From the perspective of children, the family is a "family of orientation". It serves to locate children socially and plays a major role in their enculturation and socialization (Dave, 2015). From the point of view of parent(s), the family is a "family of procreation", the goal of which is to produce, enculturate and socialize children. Different families create environment that may influence children's intellectual growth and educational motivation in different ways. The family is also the most personal for nothing is more than the interaction and relationship between members of family, since unmarried couples are bound with such ties. What gives the family its character are children. It is only in such situation that the family can untie its climate relationship and perform its functions of rearing, protecting and educating the children.

Family background can be seen as family related surroundings, matters, challenges, opportunities, problems or other family related factors which may directly or indirectly influence members of the family (Burkey, 2016). Modern Nigeria society is filled with various family challenges which

were not obtained in the past. This could be largely due to the influence of Westernization and social change, (Olukoya, 2013). Some of these challenges range from divorce, single parenting, parents separation, polygamy, and large sized families with more children to cater for (Edema, 2014). All these among other factors could influence mathematics achievement of a child especially in junior secondary schools. Ikechi (2015) added that due to the prevailing harsh economy in the country, many parents are now chasing wealth to the detriment of their children's sound up-bringing. Consequently, there are generally poor academic performance, juvenile delinquency, teenage pregnancy, bullying, examination malpractice, moral decadence, robbery, kidnapping maladjustment among students. Research evidences have attributed these vices to family background where there are parental neglect and lack of proper guidance for moral, social and academic attainment. This study therefore was a deliberate attempt to compare the mathematics achievement of junior secondary school students from different family background in Agbani education zone of Enugu state with a view to determine the influence of family environment on the students' mathematics achievement.

Undoubtedly, the term family background is very vast and may have a very wide application. However, Skull (2016) identified four major indices for describing an ideal family environment in our contemporary society. These according to Skull, include family size, family type, economic status of parents and parenting styles. Skull further broke down family size into 20 members and above, 10-19 members, 6-9 members, 5 members and below. Skull classified family types into polygamy and monogamy. Economic status of parents was categorized into high income earners, average income earners and low income earners. Parenting styles into authoritarian, democratic, neglectful and permissive. These indices were adopted for this study.

Research evidences such as Ilechukwu (2013), Edeh (2014) and Ani (2015) indicated that out of all the education zones in Enugu State, Agbani zone has the lowest educational development. This is despite its proximity to the capital city of Enugu State. This observation was the major factor that prompted the choice of the zone for the conduct of this study. Perhaps, the findings and recommendations made in the study may serve as veritable guide towards improving the educational development of the area, especially as no research evidence, known to the authors, has shown any change in the educational development status of the area of study.

Purpose of the Study:

The purpose of this study was to compare the mathematics achievement of junior secondary school students from different family backgrounds in

Agbani education zone of Enugu state. Specifically, the study aimed at ascertaining the mean mathematics achievement scores of junior secondary school three (JSS 3) students in Agbani education zone with respect to;

i. the students family sizes
ii. the students family types
iii. economic status of the students' parents and
iv. parenting styles adopted by their parents

Research Questions

The following research questions guided the study.

1. What are the mean mathematics achievement scores of JSS 3 students from different family sizes in Agbani education zone of Enugu state?
2. What are the mean mathematics achievement scores of JSS 3 students from different family types in Agbani education zone of Enugu state?
3. What are the mean mathematics achievement scores of JSS 3 students with different parental economic statuses in Agbani education zone of Enugu state?
4. What are the mean mathematics achievement scores of JSS 3 students with different parenting styles in Agbani education zone of Enugu state?

Hypotheses

The following hypotheses were tested at .05 level of significance;

1. The mean mathematics achievement scores of JSS 3students from families of different sizes do not differ significantly in Agbani education zone of Enugu state.
2. The mean mathematics achievement scores of JSS 3 students from families of different types do not differ significantly in Agbani education zone of Enugu state.
3. The mean mathematics achievement scores of JSS 3 students with parents of different economic statuses do not differ significantly in Agbani education zone of Enugu state.
4. The mean mathematics achievement scores of JSS 3students with different parenting styles do not differ significantly in Agbani education zone of Enugu state.

Methodology

Causal comparative or expost facto research design was adopted for the study. Four research questions and four hypotheses guided the study. Proportionate stratified random sampling technique was used to draw 200 Junior secondary school three (JSS 3) students from three secondary schools

in Agbani Education Zone, one school from each of the three local government areas that make up the zone namely Enugu south, Nkanu-west and Nkanu-east. Two instruments, a 28-item questionnaire and a form were used for data collection. The questionnaire was used to collect data on the students' family environments while the form was used to collect data on the students' mathematics achievement scores from records and vital documents in their schools. The questionnaire was made up of four clusters A B C and D. Cluster A addressed research question one (family size)with 4-items. Cluster B focused on research question two (family types)with 2-items. Cluster C addressed research question three (parental economic statuses)with 9-itemCluster D focused on research question four (parenting styles) with 13-items.

The instruments were validated by three research experts. Using the Cronbach's Alpha method, the questionnaire yielded an internal consistency reliability coefficient of .72. Data collection was personally undertaken by the researchers who visited the schools and administered the instruments. One researcher manned one local government area. Mean and standard deviation were used to answer the research questions while one-way analyses of variance (ANOVA) was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1

What are the mean mathematics achievement scores of JSS 3 students from different family sizes in Agbani education zone of Enugu state?

Table 1: Mean mathematics achievement scores of students from different family sizes.

Family sizes	n	Mean	SD
20 and above	1	48.1	5.01
10-19	28	64.7	4.13
6-9	151	70.2	3.04
5 and below	20	85.1	1.15

From Table 1, the results indicate that the higher the family size, the lower the mathematics achievement scores of the students. Also the standard deviation values were smaller in the smaller family sizes indicating lower extreme scores. Hence, mean scores of students in smaller families were more reliable.

Research Question 2
What are the mean mathematics achievement scores of JSS 3 students from different family types in Agbani education zone of Enugu state?

Table 2: Mean mathematics achievement scores of students from different family types.

Family types	n	Mean	SD
Polygamy	62	51.3	7.01
Monogamy	138	64.3	0.22

Table 2 above, shows that students from monogamous families had mean achievement score of 64.3 while their counterparts from polygamous families had a mean of 51.3. Also the standard deviation values were smaller in monogamous families indicating lower extreme scores. Thus, mean scores of students in monogamous families were more reliable.

Research Question 3
What are the mean mathematics achievement scores of JSS 3 students with different parental economic statuses in Agbani education zone of Enugu state?

Table 3: Mean mathematics achievement scores of students from parents of different economic statuses.

Economic statuses	n	Mean	SD
High income earners	34	78.0	2.03
Average income earners	106	66.2	1.88
Low income earners	60	54.9	2.11

From Table 3, students from high, average and low income earning homes had mean mathematics achievement scores of 78.0, 66.2 and 54.9 respectively. They also had standard values of 2.03, 1.88 and 2.11 for high, average and low income levels respectively. These values show that there were low or no extreme values in all, consequently, their mean scores actually represented their abilities.

Research Question 4
What are the mean mathematics achievement scores of JSS 3 students with different parenting styles in Agbani education zone of Enugu state?

Table 4: Mean mathematics achievement scores of students with parents of different parenting styles.

Parenting styles	**n**	**Mean**	**SD**
Authoritarian	40	63.3	3.11
Democratic	93	70.1	1.27
Neglectful or unresolved	12	40.0	1.41
Permissive	55	67.6	2.06

From Table 4, students whose parents adopted democratic parenting style had the highest mean mathematics achievement score. While those whose parents had neglectful or unresolved parenting style had the lowest mean mathematics achievement score. Standard deviation values for all the groups were small, hence, their mean scores were reliable.

Hypothesis1: The mean mathematics achievement scores of JSS 3 students from families of different sizes do not differ significantly in Agbani education zone of Enugu state.

Table 5: one-way ANOVA analyses of mean mathematics achievement scores of students from different family sizes.

Source of variation	Sum of squares	Df	Mean square	F-ratio	Sig	Remark
Between sample	899.102	3	299.7006	0.2794	0.001	Significant (reject hypothesis)
Within sample (error)	211306.34	197	1072.6210			
Total	212205.442	200				

From table 5, variation between home sizes gave an F-ratio of 0.2794 which is significant at 0.001. Since 0.001 is less than 0.2794, it means that at 0.05 level of significance, the F-value of 0.2794 is significant. Hence, hypothesis 1 is rejected as stated, implying that home sizes influenced the students' mathematics achievement score significantly.

Hypothesis 2: The mean mathematics achievement scores of JSS 3 students from families of different types do not differ significantly in Agbani education zone of Enugu state.

Table 6: one-way ANOVA analyses of mean mathematics achievement scores of students from different family types.

Source of variation	Sum of squares	DF	Mean square	F-ratio	Sig	Remark
Between sample	921.40	1	921.40	6.0818	0.214	Significant (reject hypothesis)
Within sample (error)	30149.77	199	151.50			
Total	31071.17	200				

From table 6, variation between home types gave an F-ratio of 6.0818 which is significant at 0.214. Since 0.214 is less than 6.0818, it means that at 0.05 level of significance, the F-value of 6.0818 is significant. Hence, hypothesis 2 is rejected as stated, because home types influenced the students' mathematics achievement scores significantly.

Hypothesis 3: The mean mathematics achievement scores of JSS 3 students with parents of different economic statuses do not differ significantly in Agbani education zone of Enugu state.

Table 7: one-way ANOVA analyses of mean mathematics achievement scores of students with parents of different economic statuses.

Source of variation	Sum of squares	DF	Mean square	F-ratio	Sig	Remark
Between sample	111.8	2	55.9	5.029	0.001	Significant (reject hypothesis)
Within sample (error)	2200.7	198	11.1146			
Total	2312.5	200				

From table 7, variation between parental economic statuses gave an F-ratio of 5.029 which is significant at 0.001. Since 0.001 is less than 0.5, it means that at 0.05 level of significance, the F-value of 5.029 is significant. Hence, hypothesis 3 is rejected as stated, implying that economic statuses influenced the students' mathematics achievement scores significantly.

Hypothesis 4: The mean mathematics achievement scores of JSS 3 students with different parenting styles do not differ significantly in Agbani education zone of Enugu state.

Table 8: one-way ANOVA analyses of mean mathematics achievement scores of students under different parenting styles.

Source of variation	Sum of squares	DF	Mean square	F-ratio	Sig	Remark
Between sample	30333.9	3	10111.3	368.869	0.001	Significant (reject hypothesis)
Within sample (error)	5400.1	197	27.4116			
Total	35734	200				

From table 8, variation between parenting styles gave an F-ratio of 368.869 which is significant at 0.001. Since 0.001 is less than 00.5, it means that at 0.05 level of significance, the F-value of 368.869 is significant. Hence, hypothesis 4 is rejected as stated, implying that parenting styles influenced the students' mathematics achievement scores significantly.

Summary of Findings

Findings of this study can be summarized thus;

1. Home size influenced the students' mathematics achievement scores significantly in favour of students from smaller home sizes.
2. Home type influenced the students' mathematics achievement scores significantly in favour of students from monogamous families.
3. Parental economic statuses influenced the students' mathematics achie vement scores significantly in favour of students whose parents earn high income.
4. Parenting styles influenced the students' mathematics achievement scores significantly in favour of the students under democratic parenting style.

Discussion of Findings

Research question one sought to compare the mean mathematics achievement scores of students from various family sizes.

It was found that home sizes influenced the students' mathematics achievement scores significantly in favour of students from smaller home sizes. This indicates that students from families of small sizes achieved higher in mathematics. This finding supports the findings of Dele (2014) and Ikechi (2015). However, Egemuo (2015) found the contrary. Unarguably, large family sizes are usually associated with a lot of challenges capable of threatening the wellbeing of members of such families including students. Ikechi (2015) outlined some challenges of large family sizes which may inhibit students' achievement in academic works to include improper financial support, overcrowded home and lack of attention from parents. When finance

is scarce, students will lack almost everything needed to aid learning. When the home is overcrowded the family environment becomes unconducive for learning. When students are not properly monitored by parents especially at junior secondary school level, they (students) are bound to misuse their time.

Research question two sought to compare mean mathematics achievement scores of students from various family types. It was found in this study that students from monogamous homes achieved higher in mathematics than their counterparts from polygamous homes. Ekpe (2014), Oduma (2015)as well as Ani (2015) found the same result in their separate studies. But Buba (2014) and Tarka (2015) found that students from polygamous homes out-performed their counterparts from monogamous homes. Although this study did not treat the complexity of family type in its entirety. Noteworthy is the fact that most polygamous families shared the same characteristics with large families. Similarly, most monogamous families share the same attributes with small family sizes. Hence, one is not surprised obtaining similar results from effect of family size and family types on the students' mathematics achievement scores. It is expedient to state that the difference in the findings of researchers sighted above maybe due to individual differences or different classifications of family types. For instance, while this study merely classified family types into two (monogamous and polygamous), other researchers may go as far as separating students from single parent homes and their counterparts from two or more parents homes.

Research question three sought to compare mean mathematics achievement scores of students from various parental economic statuses. It was found in this study that students whose parents earned higher income achieved more in mathematics than their counterparts whose parents earned lower income. This suggests that the higher the income of parents, the more the support their children (students) receive to improve their academic achievements. This finding is consistent with the finding of Ilechukwu (2013) who also reported that students whose parents had higher income earning achieved higher than their counterparts whose parents had lower income earning. The reasons seem to be obvious. One should expect that wealthy parents should ordinarily support their children to attain even greater heights academically. Expectedly, parents who are well to do will find it easier to employ private teachers and coaches for their children, where they are not in a position to do so themselves. On the other hand, the finding of this study on parental economic statuses on secondary school students' mathematics achievement is in sharp contrast with the finding of Edeh (2014). Edeh reported that students whose parents have low income achieved higher than their counterparts whose parents had high income. In the discussion of

findings, Edeh accused wealthy parents of imposing subjects and careers on their children. For instance, a medical doctor may likely wish his son to become a medical doctor also. Same applies to a Lawyer, Engineer, Architect, etc. Edeh posited that these wealthy parents do not consider their children's inherent potentials and competencies all they want is to raise children who will take after them in their affluent statuses.

It is also possible that a good number of rich parents are too busy to attend to their children's educational needs. Edeh further observed that a cursory look at the attendance of any secondary school's Parents' Association meeting will show that only the lowly placed in the society attend such meetings. Rich parents are only concerned mainly with payment of any required fees or dues, this some of them do without proper monitoring of the child's school activities. To strike a rational balance among the conflicting research findings discussed above, it is reasonable to state that secondary school students can perform maximally irrespective of their parental income levels. Hence both high and low income earning parents can decide to give their children the best support that will make them excel in their secondary education.

Research question four sought to compare mean mathematics achievement scores of students from various parenting styles. These styles include democratic, neglectful, permissive, and authoritarian. Democratic parenting style, according to Dave (2015) is widely regarded as the most effective and beneficial parenting style for normal children. Democratic parents are easy to recognize, as they are marked by the high expectations that they have of their children, but temper these expectations with understanding a support for their children as well. This type of parenting, according to Burkey (2016) creates the healthiest environment for a growing child, and helps to foster a productive relationship between parent and child. Contrarily, Olukoya (2013) alleged that democratic parenting style can inhibit a child's optimal development.

Neglectful parenting style according to Edema (2014) is one of the most harmful styles of parenting that can be used on a child. Neglectful parenting is unlike the other styles in that parents rarely punctuate naturally into neglectful parenting as a response to child behavior, (Perez, 2016). Perez explained that neglectful parents do not care for their child's needs that are emotional, physical, and otherwise. Also they do not have an understanding of what is going on in their child's life. Skull (2016) added that the home of neglectful parent do not provide a safe space for the child. Hence, the children cannot share their experiences and expect positive feedback rather than negative or no feedback from their parents. Such parents spend long periods of time away

from home, leaving their children alone. They often find themselves making excuses for not being there for their children. Skull added that neglectful parents do not know their child's friends and teachers. Summarily such parents are not involved in their child's life outside the home.

Haske (2014) described permissive parenting style as another potentially harmful style of parenting where parents are responsive but not demanding. These parents tend to be lenient while trying to avoid confrontation. The benefit of this parenting style is that they are usually very nurturing and loving. The negatives, however, outweigh this benefit, (Dele, 2014). Dele hinted that in permissive parenting, few rules are set for the children and the rules are inconsistent when they do exist. This lack of structure causes these children to grow up with little self-discipline and self-control. Some parents adopt this method as an extreme opposite approach to their authoritarian upbringing, while others are simply afraid to do anything that may upset their child. Authoritarian parenting style, according to Ikechi (2015) is characterized by parents who are demanding but not responsive. Authoritarian parents allow for little open dialogue between parent and child and expect children to follow a strict set of rules and expectations. They usually rely on punishment to demand obedience or teach a lesson. Ani (2015) noted that authoritarian parents have very strict rules that they believe should be followed no matter what. From the foregoings, it is not a surprise that children from democratic homes achieved higher in mathematics than their counter parts from other parenting styles.

Conclusions

Based on the findings of this study, the following conclusions were reached:

1. Home size influenced the students' mathematics achievement scores significantly in favour of students from smaller home sizes.
2. Students from monogamous homes achieved higher in mathematics than their counterparts from polygamous homes.
3. Students whose parents earned higher income achieved more in mathematics than their counterparts whose parents earned lower income.
4. Students whose parents adopted democratic parenting style achieved higher in mathematics than their counterparts whose parents adopted other parenting styles.

Recommendations

Consequent upon the findings made in this study, the following recommendations are deemed necessary:

1. Secondary school administrators and teachers should include family size, family type, parental income level and parenting styles among students' biodata they should be collecting. This will help teachers to know the characteristics of the students entrusted under their care.
2. The government and other secondary school proprietors should organize periodic seminars and capacity building workshops for secondary school teachers on how to handle the individual differences among students from diverse home environments in their teaching.
3. Parents' Association (P.A) of various secondary schools should organize conferences where parents should be taught how to make their homes supportive for their children and wards in junior secondary schools.
4. Educational counselors and psychologists in various secondary schools should train students through periodic seminars on how to cope in school irrespective of their home environments. That is, how to overcome the various challenges of their home backgrounds.

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