

Correlation Analysis Between Body Height And Academic Performance Of The Students In Mumbai

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Abstract—This paper examined the relationship between body heights and pupils' academic performance in mathematics scholastic aptitude test. The study employed quasi experimental and correlational research designs. 200 hundred pupils were sampled using multi-stage random sampling technique, 2 schools in Borivali. The heights of the pupils were measured with free standing height rods. An adapted instrument tagged. Pupils Mathematics Scholastic Test (PMSAT) was administered on the sampled pupils to elicit their aptitude performance in mathematics. The PMSAT was certified to have face validity and a predictive validity of 0.88 and the reliability coefficient of 0.85 was obtained using the split – half method. The free standing height rod was an instrument used in the health centre attached to each of the primary schools in the state. The researchers administered the instruments and the data collected was analysed using descriptive and inferential statistics at $\alpha = 0.05$ level of significance. The study revealed that there was a positive significant relationship between pupils' height and their academic performance in mathematics aptitude test. In other words, the result of the study indicated that pupils' heights are positively related to their academic performance in mathematics scholastic aptitude test.

The findings also showed that pupils' body height had positive impact on the pupils' academic performance in mathematics scholastic aptitude test. By implication the taller a pupil is, the better his academic performance in mathematics scholastic aptitude test. In other words, tall pupils performed better in mathematics aptitude test than short pupils.

Keywords- Body Height, Academic Performance, Mathematics, Scholastic Aptitude Test.

I. INTRODUCTION

MANY countries are described as developed today due to the level of the development of science and technology in that country. And science and technology uses mathematics as its basic tool. Hence, Fakuade (1977) stated that mathematics serves as a tool for use in science, technology and industries. This implies that the increase in the knowledge and the performance in mathematics of the citizens of a nation is directly proportional to the level of development of science, technology and industries in that nation. However, Mathematics is the basic tool in the development of any science-based knowledge such as technology, industry and even for sound analytical reasoning in daily living in this communication age.

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The preference of pupils in examinations is not up to the mark. Consequently, researchers have researched into factors responsible for this poor performance in math, the cause seems not to be insight. However, Case and Paxson (2008b) admitted that height positively is associated with cognitive abilities (i.e. intelligence) they further opined that height is positively correlated with cognitive abilities already at age 3 and throughout childhood which affect academic performance. They argued further that taller workers have an average higher wage because they are more intelligent. Kim et al, (2003) confirmed that the height of children positively correlates with their academic performance he further asserted that other quantities such as intelligence also show a positive correlation with height. Similar conclusion was reached by Ogunshola (2009) who found that heights of academically poor pupils were lower than the heights of academically good ones. This implies that taller children usually have higher academic performance than short children. The likely reason for this relation according to wikipedia (2009) is that growth and height had been recognized as measures of health and wellness of individuals in a population. Joel cited in Encyclopedia (2010) stated that height is a biomarker of nutritional status or general mental and physical health during development in addition, Owuamanam and Owuamanam (2004) observed that physical inadequacy such as shortness in height prevent the child from playing effectively with his age group and in turn suffers deflated ego. which affects some academic skills. On the other hand, they added that superior physical quality such as tallness enhances the child's self-esteem predicts children's school achievements and their willingness to try hard at challenging tasks. This research attempted to examine the relationship between height and academic performance of pupils in mathematics aptitude test.

II. STATEMENT OF THE PROBLEM

The problem of the study is poor academic performance in Mathematics in both internal and external examinations and the factor (s) responsible. The consequence are that graduates who lack the mathematical thoughts, concepts, theorems, principles and skills become the products of our educational institution. Since mathematics knowledge is the epicenter of the development of science and technology, which the Nigerian nation needs to become an industrialized nation. To investigate the cause of this poor performance in mathematics, this study was designed to determine whether

height is related to pupils’ academic performance in mathematics aptitude test.

III. RESEARCH QUESTIONS

The following questions were raised for the study.

1. Is there any distinct measure among the height of the pupils ?
2. Is there any relationship between the pupils’ height and their academic performance in mathematics aptitude test?
3. Does height have any effect on pupils’ academic performance in mathematics aptitude test?

IV. RESEARCH HYPOTHESES

Based on the questions raised, the following hypotheses were postulated.

1. There is no significant relationship between pupils’ height and their academic performance in mathematics aptituden test.
2. Height has no significant effect on pupils’ academic performnce in mathematics aptitude test.

V. METHODOLOGY

The study employed quasi experimental and correlational research designs. Primary V & V classes, within the age range of 9 – 13. The test instrument used to sample the pupil’s aptitude in mathematics was adapted from Kolawole (2011) tagged: Pupils Mathematics Scholastic Aptitude Test (PMSAT). containing 50 multiple choice objective item type, with 4 options (A-d) The test instrument PMSAT was certified to have face validity by an expert and a predictive validity of 0.88 The reliability coefficient of PMSAT was obtained throught the the split-half method with a coefficient of 0.85. The instruments were administrated by the researchers.

The heights of the pupils were measured with free standing heights rods. In order to get the accurate heights of the pupils’, pupils were instructed to keep their heads in the FH plane, standing straight, with both arms hanging loosely by the side and standing without shoes. These measurements were made by trained health workers attached to each of the primary schools. Data collected for the study was analyzed using descriptive statistics of mean, standard deviation and inferential statistics of correlation and regression analysis.

TABLE I
MEAN, STANDARD DEVIATION AND RANGE OF THE BODY HEIGHT OF THE PUBLIS IN EKITI STATE

Sources Of Variation				Ranges	
	N	Mean	SD	-4SD	+4SD
Body Height (BH) In Cm	200	123.52	8.70	90.81	156.23

TABLE II
CORRELATION ANALYSIS BETWEEN THE BODY HEIGHT AND ACADEMIC PERFORMANCE OF PUPILS’ IN MATHEMATICS APTITUDE TEST.

SOURCE OT VARIATIONS	N	MEAN	SD	RCAL	RTAB	RESULTS
BODY HEIGHT IN CM	200	123.52	8.70	0.43	0.195	SIGNIFICANT
PMSAT		57.12	17.26			

*P ≤ 0.05

TABLE III
THE EFFECT OF BODY HEIGHT ON PUPILS’ ACADEMIC PERFORMANCE IN MATHEMATICS

SOURCE OT VARIATIONS	N	RCAL	R2	CONST
BODY HEIGHT IN CM	900	0.38	0.184	39.41
PMSAT	900			

$$BH = -42.87 + 0.7 \text{ PMSAT}$$

*P ≤ 0.05

VI. RESULTS

Research Question

What are the measures of the body parameters of primary school pupli’s in Ekiti State?

Table 1 shows the mean of the pupils’ body height as 123.52. The standard deviation (SD) for the pupils’ is 8.70 The table also shows the ranges of the body height of the pupils obtained using, - 4SD for the minimum value of (99.95)cm and + 4SD for the maximum value of (177.03) cm. This means tha the shortest pupil 90.81 while the tallest was 156.23

Hypothesis 1

There is no significant relationship between pupils’ height and their academic performance in mathematics aptitude test. with the correlation coefficient of 0.43. The $r_{cal} = 0.45$ greater than $r_{tab} = 0.195$ which indicates that the null hypothesis is rejected. This shows that body height has a positive significant relatoionship with academic performance in Mathematics aptitude test. This implies that the taller a pupil is, the better his/her academic performance in Mathematics scholastic aptitude test

Hypothesis 2

There is no significant effect of height on pupils’ academic performance in mathematics aptitude test.

The table shows the contribution of body height to pupils’ academic performance in Mathematics scholastic aptitude test, revealing that 18.41% of the variance in the academic performance of pupils in Mathematics aptitude test is associated with variance in the body height.

This implies that body height has a positively significant effect on pupils’ academic performance in mathematics scholastic aptitude test. Finaly other body parameters order than body heights have a negatively significant effect on

pupils' academic performance in mathematics scholastic aptitude test. The study also revealed that body height contributed 18.41 the variability in pupils' academic performance in mathematics aptitude test.

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VII. DISCUSSION AND CONCLUSION

The findings of this study showed that, a positively significant relationship exists between body height and mathematics scholastic aptitude test, This implies that height positively relates to academic performance aptitude test in Mathematics

Hence this means that tall pupils are likely to perform better than short pupils in PMSAT.

This result confirmed the earlier findings of Kim et al (2003) who found that the height of children positively correlates with their academic performance and intelligence. It also supports the findings of Ogunshola (2009) which revealed that the height of academically poor pupils were lower than the height of academically good ones.

The possible reason for this finding could be that taller pupils are more intelligent than shorter pupils since height is an indicator of health growth and development, good nutritional status or general mental development. Also pure discrimination teasing and unkind appellation related to shortness could have caused short children to have poor psycho-social functioning, poor self-concept and poor academic self-esteem. This study does not imply in totality that there are no short pupils who would have performed better in math achievement test and scholastic test than some tall pupils. The result of this study also confirm the relationship between height and scholastic achievement from psychological point of view which stated that the taller the student is, the better self-esteem and self-confidence he has, also he has a better perception about his body. As a result his performance in mathematics aptitude test will get better.

VIII. RECOMMENDATIONS

We recommend that At birth the centile chart should be used to measure the height of the child and if there is any indication of stuntedness in the growth, then growth hormone could be applied to check shortness. School management should outlaw the use of mischievous appellation with respect to shortness or tallness, or any gesture that could imply that by teachers and pupils/students.

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