Teachers’ and Students’ Variables as Correlates of Secondary School Students’ Academic Performance in Mathematics in Ikere Local Government Area, Ekiti State, Nigeria

Olufinlai, O. O, Popoola, O. E & Aladesaye C. A.

1,2,3Department of Mathematics, College of Education, Ikere, Ekiti State, Nigeria.

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ABSTRACT
The study investigated the teachers’ and students’ variables as correlates of secondary school students’ academic performance in Mathematics in Ikere Local Government Area of Ekiti State, Nigeria. Descriptive survey research design was adopted for the study. The population for the study consisted of all the secondary school Mathematics students in SS1 and SS2, and all the Mathematics teachers in all the public secondary schools in Ikere Local Government Area of Ekiti State. The sample of this study was made of four hundred (400) Mathematics students and nine (9) Mathematics teachers randomly selected using stratified sampling technique. Hypotheses were postulated to find out whether, (i) students and teachers’ variables influences academic performance of students in Mathematics (ii) predictive strength of students and teachers’ gender disparity influences the academic performance of students in Mathematics. The study revealed that teaching method, gender, students and teachers’ variables have significant effect on academic performance of students in Mathematics. Based on the findings, it is recommended that only the well qualified teachers should be employed to teach Mathematics in secondary schools. Higher degree must be made compulsory for them so that their knowledge will be refreshed, updated and current in order to impact maximally on students to attain good academic performance in Mathematics.

Keywords: Mathematics; Teaching Method; Performance; Students’ variables; Teachers’ variables.

Introduction
The world is fast becoming scientific in thinking and behaviors that without good knowledge of science, particularly Mathematics, it might be difficult for people to adequately function in it. The purpose of exposing children to science instruction right from primary school level is not necessarily to turn them into scientist per se but to provide favorable scientific attitudes of ‘finding out’ and ‘hands-on’ and to enable them raise questions about things that intrigue them.

The acute shortage of science manpower for the 2nd National Development Plan was a precursor to the rapid growth in the number of Polytechnics in Nigeria. Despite this growth, however, a close appraisal of the third National Development Plan revealed yet a serious distortion. Today the credo in governmental circles is vision 20, 2020. This slogan presupposes that in the year 2020, Nigeria would be among the most economically advanced countries of the world. We however, are skeptical because the problems facing science education and technological development in Nigeria are yet to be addressed. Indeed, a developing economy requires a large pool of scientific manpower to sustain its development. Nigeria, however has failed dismally to prepare, equip and train adequate number of its citizens to cope with its developmental needs.

The issue of poor academic performance of students in Ekiti State has been of much concern to all and sundry. The problem is so much that it has led to the widely acclaimed fallen standard of education in the State and Nigeria at large. The quality of education depends on the teachers as reflected in the performance of their duties. Over time, students’ academic performances in both internal and external examinations had been used to determine excellence in teachers and teaching (Ajao, 2001 in Agharuwhe et al. 2009).

In recent times, the overall performance of students in the subject in Ekiti State at the school certificate level has been generally not too impressive. Many distinguished scholars and personalities in the society have expressed concern about the situation.

The performance could be used to adjudge the readiness of Ekiti State and the country for its technological development. It is sad to note that the performance in this subject in Ekiti State educational system is very unsatisfactory. A critical look at some public examination results such as WAEC (Table 1) repudiates the seriousness the Nigerian Educational policy attaches to this discipline which is manifested by skewing admissions into tertiary institutions to 60%, 70% and 80% (for conventional Universities,
Polytechnics and Universities of Technology respectively) for science and technology based programme and the proliferation of technological and technical institution.

Considering government huge investment in public examination, its output in terms of quality of students has been observed to be unequal with government expenditure. Consequent upon the observed deterioration in the academic performance, attitude and values of secondary school students in public secondary schools, one wonders if the high failure rates and the poor quality of the students are not reflections of both the teacher and student variables. In other words, the ineffectiveness of both the teachers and the students in the classroom interaction could be responsible for the observed poor performance of students in Mathematics and the widely acclaimed fallen standard of education in Ekiti State.

Ogunniyi, cited in Alabi (2008) identified the following among the variables that are responsible for students' poor performance. These variables includes: Shortage of well trained teachers; inadequacy of teaching facilities; lack of funds to purchase necessary equipment; poor quality textbooks; large class/over crowded classroom/laboratory/workshop; poorly motivated teachers and lack of laboratory and libraries.

Observation shows that some other variables not mentioned in the above list but that may equally be responsible for students' poor performance include teachers' attitude toward students, ineffective teaching/competence of teachers, teachers qualifications, teaching style, attitude of student to science (Mathematics), learners background, student preparedness to learn, societal values, unstable political system, teachers absenteeism amongst others.

Table 1: Statistics of Percentage Performance in Science Subjects at Credit Passes in May/June (2005-2009) WAEC O/Level Examinations.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mathematics</th>
<th>Biology</th>
<th>Chemistry</th>
<th>Physics</th>
<th>Agric. Sc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>35.0</td>
<td>30.0</td>
<td>39.0</td>
<td>58.0</td>
<td>38.0</td>
</tr>
<tr>
<td>2006</td>
<td>46.0</td>
<td>53.0</td>
<td>55.0</td>
<td>64.0</td>
<td>44.0</td>
</tr>
<tr>
<td>2007</td>
<td>55.4</td>
<td>9.68</td>
<td>55.1</td>
<td>56.9</td>
<td>49.5</td>
</tr>
<tr>
<td>2008</td>
<td>51.6</td>
<td>21.6</td>
<td>26.1</td>
<td>37.6</td>
<td>39.5</td>
</tr>
<tr>
<td>2009</td>
<td>54.0</td>
<td>31.0</td>
<td>55.0</td>
<td>54.0</td>
<td>56.0</td>
</tr>
</tbody>
</table>

Source: Ekiti State Ministry of Education, Ado Ekiti.

Teachers have been shown to have an important influence on students' academic performances and they also play a crucial role in educational attainment because the teacher is ultimately responsible for translating policy into action and principles based on practice during interaction with the students (Afe, 2001). Both teaching and learning depends to some extent on teachers; no wonder an effective teacher has been conceptualized as one who produces desired results in the course of his duty as a teacher (Uchefuna, 2001).

Comparatively, candidates' performances in the technical, social science and art subject make no much difference to the Basic science except in Yoruba language, Islamic studies and Food & Nutrition where up to 50% credit pass and above were recorded.

Table 2: Percentage performance of candidates in WASSCE in some popular subjects in Ekiti State.

<table>
<thead>
<tr>
<th>Subject</th>
<th>% of passes at Credit</th>
<th>% of Failure (F9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
<td>2008</td>
</tr>
<tr>
<td>English Language</td>
<td>25.5</td>
<td>28.7</td>
</tr>
<tr>
<td>Mathematics</td>
<td>55.4</td>
<td>51.6</td>
</tr>
<tr>
<td>Physics</td>
<td>43.0</td>
<td>37.6</td>
</tr>
<tr>
<td>Chemistry</td>
<td>55.1</td>
<td>26.1</td>
</tr>
<tr>
<td>Biology</td>
<td>9.7</td>
<td>21.6</td>
</tr>
</tbody>
</table>


Within the 3 years surveyed (2007, 2008 and 2009); the level of credit pass in the subject varied from 51.6% to 55.4% while the level of failure ranged from 13.0% to 20.0%. In 2007, Mathematics recorded good result with (55.4%) pass.

In 2008, Mathematics recorded a drop in performance result with 51.6% level of pass, and one of the high failure rates (19.0% failure). Despite all effort to improve interest in Mathematics, the performances of students as evidenced in their subject preferences and performances in external examination is not encouraging. As a matter of fact, Nigeria needs to acquire, develop, adopt and indigenize modern science in other to inculcate scientific culture in the society; hence concerted efforts should be
made to examine/investigate both the teachers and students variables as correlates that are responsible for
the academic performance of student in Mathematics.

Upon this background, it became pertinent to investigate students’ academic performance in
Mathematics in Ikere Local Government Area of Ekiti State. Poor learning and lack of teaching skill
acquisition were problem for this study, this is what the researchers saw and get disturbed and prompted
us to carry out this study. The researchers observed that if Mathematics students do not cultivate right
attitude and good study habit towards Mathematics among other variables, it may become very difficult for
these students to perform excellently well in the subject.

Likewise, if Mathematics teachers do not have the right attitude towards the teaching of the subject
and they are not committed /dedicated to the teaching of the subject, it may become very difficult for
teachers to impact the right knowledge which would be required by students to excel in the subject. This
study investigated students and teachers variables as correlates of secondary school students’ Mathematics
academic performance in Ikere Local Government of Ekiti State.

Research Hypotheses
The following research hypotheses were formulated and tested at $P < 0.05$:

$H_01$: There is no significant difference between students’ variables and Students’ academic
performance in Mathematics.

$H_02$: There is no significant difference between teachers’ variables and students’ academic
performance in Mathematics.

$H_03$: There is no significant relationship between the contributions of Students’ variables
to the academic performance of secondary school student in Mathematics.

$H_04$: There is no significant relationship between the contributions of teachers’ variables
to the academic performance of secondary school students in Mathematics.

$H_05$: There is no significant relationship between the predictive strength of students and
teachers’ variables on students’ academic performance in Mathematics.

Methodology
The study is descriptive research of survey type which involves the students and teachers variables
as correlate of secondary school students’ academic performance in Mathematics in Ikere LGA of Ekiti State.
The design afforded the researcher the opportunity to collect both the primary and secondary data which
helped to facilitate better understanding and evaluation of the problem under study. The variables of the
study were teachers’ and students’ variables (independent variables) and students’ academic performance
(dependent variable).

The population of this study were all 141 public secondary schools in Ekiti State while the target
population is the entire public secondary schools (Mathematics students and teachers) in Ikere Local
Government of Ekiti State.

A simple random sampling technique which was later stratified into gender was used to select a
total of forty (40) Mathematics students each from ten selected secondary schools to form a total of four
hundred (400) Mathematics students (male and female) from Ikere Local Government Area from the
selected schools for the study. And a total of nine (9) Mathematics teachers (male and female) were selected
using simple random sampling.

The main instruments used to collect data for the study is; Questionnaire: (i) For the selected
Mathematics teachers and (ii) For the selected Mathematics students. To ensure validity of the instruments
used, the content and face validity of the questionnaire items was ensured. The instruments were
ascertained using test-retest methods at different occasions to a group of students outside those selected
for the study but of comparable experience and ability. The responses obtained from the two
administrations were then correlated using Product Moment Correlation method. The Correlation
Coefficient of 0.90 was obtained for Students’ Variable and Academic Performance in Mathematics
(SVAAPM) which is judged well enough for the study. Being a descriptive research, simple frequency counts
and percentages was used for the demographic status of the respondents. The data collected was
analyzed using Pearson’s product moment correlation and $t$-test statistic at 0.05 level of significance.

Results
Hypothesis 1: There is no significant difference between students’ variables and students’
academic performance in Mathematics.
Table 3: *t*-Test analysis of students’ response

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t(cal)</th>
<th>t(tab)</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>205</td>
<td>1.64</td>
<td>0.48</td>
<td>397</td>
<td>16.34</td>
<td>1.96</td>
<td>S</td>
</tr>
<tr>
<td>Female</td>
<td>194</td>
<td>2.71</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P<0.05 level of significance.

From Table 3, the mean variable of male respondents (1.64) is less than the mean variable of female respondents (2.71) with a difference of (1.07). The measure of variability (standard deviation) has a difference of (0.31) which is marginal.

The *t*-test analysis reveal that *t*(cal)(16.34) exceeded the *t*(tab)(1.96) at p<0.05 level of significance. This implies that there is significant difference in students’ variables and students’ academic performance in Mathematics. Hence, the null hypothesis was not upheld.

**Hypothesis 2**: There is no significant difference between teachers’ variables and students’ academic performance in Mathematics.

Table 4: *t*-Test analysis of teachers’ response

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>t(cal)</th>
<th>t(tab)</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4</td>
<td>1.00</td>
<td>0.00</td>
<td>7</td>
<td>2.83</td>
<td>2.36</td>
<td>S</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>2.20</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P<0.05 level of significance.

From Table 4, the mean variable of male respondents (1.00) is less than the mean variable of female respondents (2.20) with a difference of (1.20). The measure of variability (standard deviation) has a difference of (0.84) which is equally marginal.

The *t*-test analysis reveal that *t*(cal)(2.83) exceeded the *t*(tab)(2.36) at p<0.05 level of significance. This implies that there is significant difference in teachers’ variables and students’ academic performance in Mathematics. Hence, the null hypothesis was not upheld.

**Hypothesis 3**: There is no significant relationship between the contributions of students’ variables and academic performance of secondary school students in Mathematics.

Table 5: Chi-Square analysis of students’ response

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>df</th>
<th>Calculated $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>9</td>
<td>503.08</td>
<td>16.92</td>
<td>0.09</td>
</tr>
</tbody>
</table>

P<0.05 level of significance.

As shown in Table 5, a chi – square of independence was performed to examine the relationship between the contributions of students’ variables and academic performance of secondary school students in Mathematics.

The table shows that the two variables was obviously significant since the calculated $\chi^2$ (503.08) exceeded the critical $\chi^2$ (16.92) at the 0.05 level of significance. This implies that there is a significant relationship between the contributions of students’ variables and academic performance of secondary school students in Mathematics. Hence, the null hypothesis was not upheld.

**Hypothesis 4**: There is no significant relationship between the contributions of teachers’ variables and academic performance of secondary school students in Mathematics.

Table 6: Chi-Square analysis of students’ response

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>df</th>
<th>Calculated $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>6</td>
<td>13.20</td>
<td>12.59</td>
<td>0.04</td>
</tr>
</tbody>
</table>

P<0.05 level of significance.

As shown in Table 6, a chi – square of independence was performed to examine the relationship between the contributions of teachers’ variables and academic performance of secondary school students in Mathematics.

The table shows that the two variables was significant since the calculated $\chi^2$ (13.20) exceeded the critical $\chi^2$ (12.59) even though marginally at the 0.05 level of significance. This implies that there is a significant relationship between the contributions of teachers’ variables and academic performance of secondary school students in Mathematics. Hence, the null hypothesis was not upheld.
Hypothesis 5: There is no significant relationship between the predictive strength of students and teachers' variables on students' academic performance in Mathematics.

### Table 7: Chi-Square analysis of students and teachers' variables

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>Calculated $\chi^2$</th>
<th>Table $\chi^2$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>9</td>
<td></td>
<td>478.93</td>
<td>16.92</td>
<td>0.01</td>
</tr>
</tbody>
</table>

P < 0.05 level of significance.

As shown in Table 7, a chi-square of independence was performed to examine the relationship between the predictive strength of students and teachers' variables for students' academic performance in Mathematics.

The table shows that the two variables were significant since the calculated $\chi^2$ (478.93) exceeded the critical $\chi^2$ (16.92) at the 0.05 level of significance. This implies that there is a significant relationship between the predictive strength of students and teachers' variables for students' academic performance in Mathematics. Hence, the null hypothesis was not upheld.

**Discussion of Findings**

The result obtained for the test of hypothesis one (Table 3) showed that there is significant difference between students' variables and students' academic performance in Mathematics among secondary school students in Ikere Local Government Area of Ekiti State. This result agreed with the findings of Soyinbo (1982) that attitude is a critical factor in learning. It also agreed with the assertion of Omotayo (2002) and Adodo (2005) that students' positive attitude to science correlate high with their science achievement.

The result obtained for the test of hypothesis two (Table 4) revealed that there is significant difference between teachers' variables and students' academic performance in Mathematics among secondary school students in Ikere Local Government Area of Ekiti State. The result agreed with the findings of Finlayson (2009), Afe (2001) and Adodo (2005).

The result obtained for the test of hypothesis three (Table 5) showed that there is significant relationship between the contribution of students' variables and academic performance of secondary school students in Mathematics. The result revealed that the students' gender is the best single predictor of students' academic performance in Mathematics. The result was at variance with the studies of Iroegbu (1991), Badekale (1997) and Ige (1998), which concluded that teachers should perceive girls as same source of intellect like boys and they see gender not to be important in students' achievement as their innate ability.

The result obtained for the test of hypothesis four (Table 6) showed that there is significant contribution of teachers' variables to the academic performance of secondary school students in Mathematics. The result revealed that the teachers' method of teaching is the best single predictor of students' academic performance in Mathematics.

The result obtained for the test of hypothesis five (Table 7) showed that there is significant relationship in the predictive strength of students and teachers variables for students' academic performance in Mathematics. The result revealed that the joint effect of the students and teachers variables on academic performance of students in Mathematics.

**Conclusion**

The findings of this study concluded that teachers' attitude towards teaching Mathematics and methods of teaching and students variables (self-concept, students' attitude towards Mathematics, vocational interest and study habit) were significantly important to students' academic performance in the subject. This simply implies that performance in Mathematics strongly depend on students and teachers' variables..

**Recommendations**

Based on the findings of this study, the following recommendations are put forward to boost students and teachers' variables in respect to students' academic performance in Mathematics among secondary school students in Ikere Local Government Area of Ekiti State:

- Only the well qualified teachers should be employed to teach Mathematics in secondary schools. Higher degree must be made compulsory for them so that their knowledge will be refreshed, updated and current.
Appropriate methods of teaching Mathematics must be applied from time to time, for instance, those topics that has to be taught with learning by doing must be taught with appropriate teaching techniques.

Mathematics teachers must cultivate the right attitude towards the teaching of the subject. They should always inspire the students so that the students will be willing to learn from them.

Mathematics students must cultivate right attitude towards the learning of the subject. They should have the mind that Mathematics is fascinating, view it as something around them every day and not as an abstract subject.

Mathematics students must have good perception of themselves, they should belief that they will perform better among their group whenever they were being examined.

Mathematics students must cultivate good study habit and good interest in the subject. They should learn how to go over what they were being taught for that day in Mathematics at night and make consultation to other text to widen their knowledge / scope on the topic.

References

In one word, this ideal is that you are divine.

~ Swami Vivekananda