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DETERMINANTS OF THE NATIONAL ACHIEVEMENT TEST RESULTS OF THE SECONDARY SCHOOLS IN THE PROVINCE OF BILIRAN, PHILIPPINES

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ABSTRACT

This study was conducted to determine the performance of senior secondary students of the secondary schools in the province of Biliran, Philippines in the national achievement test and to examine whether non-intellective variables significantly influenced the achieved ratings of the said test. Sixteen (16) secondary schools were involved in the study comprising eight (8) municipalities and 1,470 student-respondents who took the test. It used the descriptive method where it described the data obtained from the survey. The performance of the senior students in the national achievement test was above average. Age and gender of students and the size and type of the secondary school were significant determinants affecting their achievement test results. Young and female examinees performed better than their counterpart in the achievement test. Big secondary schools performed better than the small secondary schools while vocational secondary schools achieved better than the national secondary schools in the said test. Considering age and gender of senior students as determinants influencing achievement results, it is recommended that special classes and remedial instructions for the low achievers should be provided by the concerned school principals and administrators. Secondary schools which are situated in one municipality should be integrated especially if the distance is very manageable, favourable and accessible. Furthermore, national secondary schools should adapt the administration and supervision of instruction of vocational secondary schools.

KEYWORDS: determinants; national achievement test; results; senior students; secondary schools; age; gender; school size; national secondary school; vocational secondary school

INTRODUCTION

The Philippine government, through the Department of Education (DepEd), aims to uphold and instil high regard to education for Filipinos. The DepEd is the primary government entity responsible for education and manpower development (UNESCO, 2011). Its main thrust is to make quality education available to every Filipino learner. Said education is a vital ingredient towards global competitiveness, especially for a developing country like the Philippines. This is what the country needs, a knowledge-driven society leading to economic growth and stability.

To ensure the mission of attaining quality education, DepEd conducts the National Achievement Test (NAT) every year to Filipino students. The test attempts to measure the performance of students in various learning areas like: Mathematics, English, Science, Filipino, etc. It reflects not only the level of proficiency and understanding of the students but serve as well as a gauge whether the quality of education has increased or decreased (NSO Philippine Yearbook, 2011). These account for the possible determinants that may influence student achievement such as gender (EURYDICE, 2010, Saritas & Akdemir, 2009), age, and other teacher and school-related factors.

In a UNESCO World Report (2011), the NAT passing rate for Filipino students was low. In addition, the Philippines ranked 23rd out of 25 participating countries with respect to performance in Mathematics and Science subjects. Alarmed by the declining quality of basic education, the DepEd needs to review its thrusts, programs and policies and pinpoint problems which are responsible for these facts and coincide with the reforms initiated by the government toward the strengthening of basic education through the provision of a strong foundation in Science and Mathematics in order to attain the Newly Industrialized Country status for the Philippines by the 21st century.

Meanwhile, in DepEd- Division of Biliran, similar scenario appears and poses a humble challenge for basic education teachers. Do they have roles to be played when it comes to students' achievement? It is on this premise that this study has been conducted for purposes of finding out determinants of national achievement test results of senior students in

the entire Division of Biliran and come up with some learning skills needed to improve students' academic performance.

REVIEW OF LITERATURE

The following literature is reviewed to provide substance and support to the conduct of this study.
The study of Alcasid (1976), on demographic factors affecting the performance of senior students in national college entrance examination disclosed that the type of school where one graduated, personal factors such as age and sex, population of the community where the student resided and where his school was located, were significantly related to high performance in the said examination.

Eitle (2005), in his article revealed that there was a relationship between gender and academic achievement of students. It was found out that there was a gap between the achievement of boys and girls, with the latter indicating better performance than the former in certain instances (Chambers & Schreiber, 2004). Gender, ethnicity, and father's occupation are significant determinants to student achievement (McCoy, 2005; Peng & Hall, 1995).

Farooq, Chaudhry, Shafiq & Berhanu (2011) in their article disclosed that students' gender strongly affects their academic performance, with girls performing better in the subjects of Mathematics and English as well as cumulatively. Girls usually show more efforts leading towards better grades at school (Ceballo, McLoyd & Toyokawa, 2004).

Studies of the relationship between gender and student performance show that girls have a higher reading performance than boys. While studies show that gender differences in mathematics are varied, most reveal no consistent gender gap among learners at the primary level(EURYDICE, 2010; Nguyen, Wu & Gillis, 2005; Rothman & McMillan, 2003; World Bank, 2004; OECD, 2009).

In their thesis, Busine & Logronio (2011) considered class population as a variable. Their study bared that as class size (student-teacher ratio) increases, the national achievement test scores of public high school students decreases.

Findings from the study of Escleto (1998) contradicted that of Busine and Logronio. The former revealed that class population may not be statistically significant but contributed to determine the test achievement scores.

In general, the review of literature showed that considerable researches have been made on determinants affecting students' scholastic achievement. Said researches have revealed the relationship among several factors such as age, gender and others as they affect the academic performance of students.

THEORETICAL AND CONCEPTUAL FRAMEWORK

The study was conceptualized based on the following theoretical framework. It was carried out following the concept anchored on its theoretical support.

The model prepared by Fraser, et. al. (1989) identified three clusters of variables that have been established to influence learning. This included the teacher, students (where age and sex are determined) and school population.

With respect to the present research, it is hypothesized that the national achievement test results of senior students in the Division of Biliran are influenced by age, sex, population and school type.

It is a general belief of teachers and other educators that older students outperform the younger ones considering the former's advanced maturity level. Female students tend to perform better in the academics than their counterpart taking into account that male students are more susceptible to delinquent activities.

Further, schools of lesser population are presumed to perform better than the bigger ones considering that the academic needs of the students in the former may be well attended to as compared to the needs of the students in the latter. In addition, purely academic schools achieve better than the vocational schools taking into account the former's nature and type of curricular offering.

The foregoing helped the writer in the conceptualization of this study. It anchored on the determinants of the national achievement test results of senior students in the secondary schools in the province of Biliran. To deeply appraise the intention of the study, it looked into the performance of the students in the said test and arrive to learning implications needed for an improved academic performance.

Figure 1 presents the conceptual framework of the study.

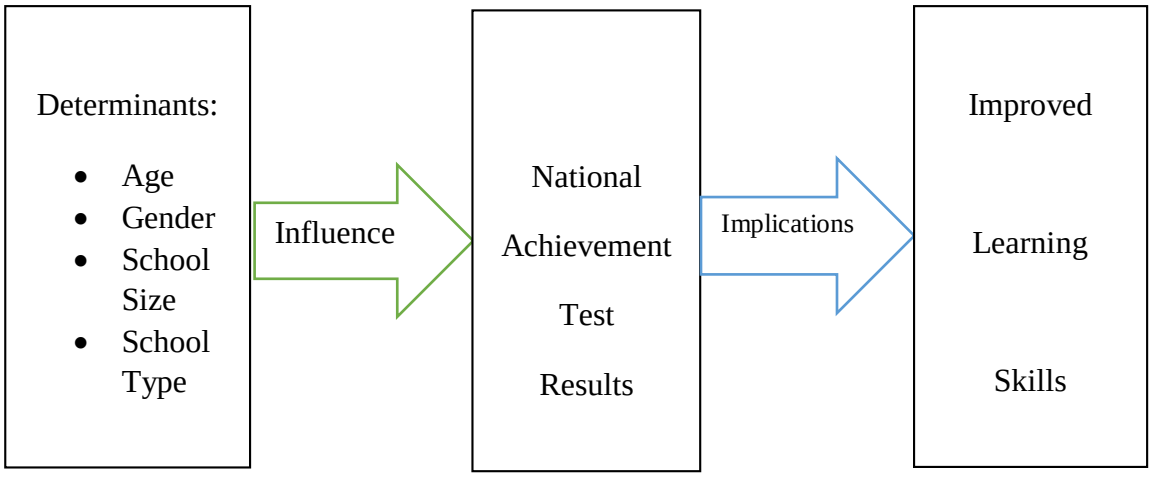

Figure 1. Conceptual framework of the study

OBJECTIVES OF THE STUDY

This study generally aimed to determine the performance of senior students in the national achievement test and to examine whether non-intellective variables significantly influenced the achieved ratings in the said test.
Specifically, the study will seek to answer the following questions:

1. To what extent do the personal factors of the senior students, namely: age and gender significantly influence the results of the national achievement test
2. To what extent does the demographic factor like the population of the secondary schools influence the results of the national achievement test?
3. Is there a significant difference between the national achievement test results of national high schools (or purely academic high schools) and vocational secondary schools? And
4. What implications can be drawn from the study?

Null Hypotheses

The writer formulated the following null hypotheses which were tested through the use of statistical treatments:

1. The personal factors like age and gender do not significantly influence the results of the national achievement test of senior secondary students in the province of Biliran;
2. The demographic factor like population of the secondary schools does not influence the results of the national achievement test; and
3. There is no significant difference between the results of the national achievement test of national and vocational secondary schools.

Methodology

This segment of the study discusses the research design, locale, respondents, instrument, data gathering procedure, data scoring/measurement of variables and statistical treatment of the data.

Research Design

This study used the descriptive method of research where it described the data obtained from the survey. The standard survey was the exact method used in this study because it permitted looking into the personal and school-related factors that affect achievement results.

Research Locale

The whole province of Biliran is the scope of the study. It is in this area where the sixteen (16) secondary schools involved in the research are located.

Eight (8) municipalities composed the province namely: Almeria, Biliran, Cabucgayan, Caibiran, Culaba, Kawayan, Maripipi and Naval (the capital town).

Research Subjects

The respondents of this study were 1,470 senior secondary students of sixteen (16) secondary schools in the province of Biliran who took the national achievement test. Of the 16 secondary schools, eleven (11) were national (purely academic) high schools and five (5) were vocational secondary schools. Names of schools were designated as A, B… and P. Table 1 presents the distribution of respondents by school.

Table I
Distribution of Respondents by School

Name of Secondary School	No. of Respondents
1. A*	191
2. B*	66
3. C*	52
4. D*	24
5. E*	79
6. F*	64
7. G*	89
8. H*	233
9. I*	34
10. J*	107
11. K*	47
12. L**	127
13. M**	153
14. N**	72
15. O**	77
16. P**	55
Total	1,470

* National (purely academic) high school
** Vocational secondary school

Research Instrument

The writer used a structured questionnaire (Refer to Appendix A) as the main tool in getting the needed data. He made use also of the senior students' general average results in the national achievement test.

The questionnaire was structured that the respondents needed to answer only information like name, age, gender, name of school, type of school and population of school attended. Aside from the information taken from the main tool, other records were verified. Information on the population of the secondary school and the results of the national achievement test were obtained from the offices of the heads of schools involved in the study. Questionnaire and documentary analysis techniques were combined.

Procedures in Gathering the Data

Permission was earnestly asked from the heads of the schools concerned through the Schools Division Superintendent of Biliran (Refer to Appendix B) before the questionnaire was given to each respondent.

The writer himself distributed the questionnaire to the student-respondents of the sixteen secondary schools in order to gather prompt, accurate, and perfect responses. Through the aid of their class advisers, said students were obliged to respond every item carefully for their responses will be all kept confidential.

After the collection of the answered questionnaires with utmost accuracy, tallying, analysing, and interpreting the data gathered followed.

Statistical Measures

The chi-square in contingency tables was used to test the significant influence of age, gender, and population of the school to the results of the national achievement test.

With **r** x **c** (rows and columns) contingency table, chi-square (Ferguson, 1971) provides an appropriate test of association and it is also a measure of discrepancy between the observed cell frequencies and those expected on the basis of whether or not the variables are independent of each other or associated.

Following is the formula for chi-square (x^2) (Garrett, 1961) :

$$x^2 = E\ \frac{(f_o - f_e)2}{f_e}$$

where: E= summation symbol
f_o= observed frequency; and
f_e= expected frequency.

The researcher used .05 alpha level of significance as the basis either to negate or confirm the hypotheses.

In testing the difference between two means, the Z-test formula was used to signify the difference on the results between national and vocational secondary schools in order to pin-point whether the type of school affected the students' performance in the national achievement test.

Z-test computation also involved the use of the mean and the standard deviation.

The Mean. To obtain the average group achievement, computed was the mean rating of each comparison group. Here's the formula for mean computation (Garrett, 1966):

$$M = AM + \frac{E\ fd}{N} x\ i$$

The Standard Deviation. The most reliable measure of dispersion is the standard deviation (SD). It is also the most stable index of variability and is customarily employed in experimental and research studies. The formula (Garrett, 1966) for computing the standard deviation was:

$$SD = i\sqrt{Efd^2/_n - (Efd/_n)^2}$$

The Z-Test. In testing the difference between two means, the formula (Walpole, 1964) was:

$$Z = \frac{(X_1 - X_2) - do}{\sqrt{(\sigma^2_1/n_1) + (\sigma^2_2/n_2)}}$$

Where: x_1 & x_2 = the mean of the first and second samples
σ_1 & σ_2 = the SD of the first and second samples

n_1 & n_2 = the number of cases of the first and second samples
do = zero, if the mean of the first sample is assumed equal to the mean of the second sample.

Data Scoring. To determine students' average ratings in the national achievement test, the following categorizations were adopted:

Group I - below 75%
Group II - 75% (the passing average)
Group III - above 75%

On personal and non-intellective variables;

For ages of students, the following were applied:

Group I - 15-17 years (covering below 17 years & 6 months), young group
Group II - 18 years & up (covering above 17 years & 6 months), old group

Gender of respondents:

Group I - Male
Group II - Female

On population of the secondary schools:

Group I - below 600 (small school)
Group II - above 600 (big school)

On the type of high schools:

Group I - national high schools
Group II - vocational secondary schools

RESULTS AND DISCUSSION

The objectives of this study were to determine how the senior students of the secondary schools in the province of Biliran performed in the national achievement test and to identify certain determinants that affect the said test.

Performance of Senior Students in the National Achievement Test. Table II shows the number of respondents who took and passed the national achievement test, the mean ratings and the passing percentage in the said test.

Table II
National Achievement Test Results Profile of Biliran Division

Name of Secondary School	No. of Respondents	Passed	Mean Rating	Percent Passing
1. A*	191	177	79.73	93
2. B*	66	61	78.77	92
3. C*	52	47	78.96	90
4. D*	24	23	81.58	96
5. E*	79	74	80.63	94
6. F*	64	58	77.48	91
7. G*	89	66	76.93	74
8. H*	233	210	78.85	90
9. I*	34	30	78.29	88
10. J*	107	104	80.55	97
11. K*	47	30	75.43	64
12. L**	127	120	80.15	94
13. M**	153	132	77.82	86
14. N**	72	59	77.56	82
15. O**	77	73	80.36	95
16. P**	55	55	86	100
TOTAL	1,470	1,319	79.22	90

Throughout the statistical testing of the different variables involved in the study, students' average ratings in the test were grouped into three, namely: above 75%, 75% (the passing average) and below 75%.

The data on said table revealed that the senior students' overall mean performance in the national achievement test was 79.22% and the total passing percentage was 90. Since the overall mean rating was above the passing average of 75%, the results disclosed that the national achievement test performance of senior students from the secondary schools in the province of Biliran was above average. This would suggest that there is still a need for the concerned schools to exert more efforts, especially those achieving below 75 in passing percentage, in order to improve further their performance in the said test.

The Influence of Age to the Results of the National Achievement Test. Age factor was the first variable tested in this research. This was done in order to pin-point whether or not students' ages significantly influenced the results of the National Achievement Test.

There were two categories in the age grouping of respondents, the 15-17 (young group) and the 18-and-above (old group) age groups. Belonging in the 15-17 age group were senior students aging 17 years and 6 months below while those aging above 17 years and 6 months fall under the 18-and-above category.

Of the 1,470 senior students who took the test, 1,057 belonged to the young group while 413 belonged to the old group.

Table III shows the grouped national achievement test ratings and ages of students where figures outside the parentheses indicate the observed frequencies and those inside as the expected frequencies.

Table III

Grouped National Achievement Test Ratings and Age of Students

National Achievement Test Rating	Age		Total
	15-17	18 & above	
Above 75%	891 (869.33)	318 (354.48)	1,209
75%	73 (79.10)	37 (30.90)	110
Below 75%	93 (108.58)	58 (42.42)	151
Total	1,057	413	1,470
Mean	79.61	78.21	
Degree of Freedom		2	
Tabulated Chi-Square		5.991	
Computed Chi-Square		13.92	

The chi-square computation at .05 level of significance revealed a value of 13.92, greater than the tabulated value of 5.991.

The null hypothesis that age does not significantly influence the results of the national achievement test was rejected which meant that age significantly influenced the results of the said test.

Meanwhile, 15-17 age group had a mean score of 79.61 and the 18-and-above age group bared a lower mean of 78.21. Basing from this result, young students achieved better than the old group with respect to national achievement test. This would imply that the young group of students' learning skills were more developed considering that they were more focused on their studies as compared to the old group of students who were more likely to be involved in some livelihood activities.

The Influence of Gender to the Results of the National Achievement Test. Gender was the second variable tested in this study. It was assumed earlier that females are better performers than males considering that they are less susceptive to vices and more diligent in their studies. Table IV presents the grouped national achievement test ratings and gender of students.

Table IV
Grouped National Achievement Test Ratings and Gender of Students

National Achievement Test Rating	Gender		Total
	Male	Female	
Above 75%	505 (554.42)	706 (656.58)	1,211
75%	60 (49.90)	49 (59.10)	109
Below 75%	108 (68.67)	42 (81.33)	150
Total	673	797	1,470
Mean	78.46	79.86	
Degree of Freedom		2	
Tabulated Chi-Square		5.991	
Computed Chi-Square		53.45	

There were 673 males and 797 females who took the national achievement test. As to their mean scores, male respondents got 78.46 while the females 79.86. The chi-square table value was 5.991 at .05 level of significance. The computed chi-square value was 53.45, greater than the tabulated value of 5.991. The null hypothesis that gender does not influence the results of the national achievement test was rejected. The result disclosed that gender significantly influenced the results of the said test. This would imply that female students were more serious and diligent in their studies as compared to their counterpart considering that the former were less susceptive to vices and juvenile delinquencies.

The Influence of the Population of the Secondary Schools to the Results of the National Achievement Test. Population of the secondary schools was one of the variables tested in this research. This part of the study tested the null hypothesis that population of the high schools involved does not influence the results of the national achievement test. Said population was categorized into two, namely: the above 600 (big school) and below 600 (small school) population. Table V presents the grouped ratings of national achievement test and population of secondary school.

Table V
Grouped National Achievement Test Ratings and Population of Secondary School

National Achievement Test Rating	Population		Total
	Above 600	Below 600	
Above 75%	679 (667)	530 (542)	1,209
75%	64 (60.69)	46 (49.31)	110
Below 75%	68 (83.31)	83 (67.69)	151
Total	811	659	1,470
Mean	79.29	79.02	
Degree of Freedom		2	
Tabulated Chi-Square		5.991	
Computed Chi-Square		7.16	

There were 811 students who came from schools having a population of more than 600 and 659 respondents were from schools having a population of less than 600. As reflected in the table, the mean scores were 79.29 and 79.02 for the above 600 and below 600 population of the secondary schools respectively.

Chi-square computation at .05 level of significance was 7.16 while the table value was 5.991. Since the computed value was greater than the tabulated one, the null hypothesis that population of the secondary school does not influence the results of the national achievement test was rejected. This meant that population of the secondary school significantly influenced the results of the said test.

As revealed by the computation, high schools with bigger population performed better than secondary schools which have lesser number of students. This would imply that when it comes to national achievement test, the learning skills

of students coming from big schools are more developed as compared to those coming from small schools taking into account that the former are more established and organized in academics as compared to the latter.

The Difference of the Results of the National Achievement Test Between National and Vocational Secondary Schools. There were 986 senior students from the national high schools and 484 from the vocational secondary schools who took the national achievement test. Table VI presents the statistical analysis of the performance of senior students coming from these two high schools.

National high schools obtained a mean score of 78.97 with an SD of 3.94 as shown in Table VI. The vocational secondary schools got a mean of 79.73 with an SD of 4.27. The computation of the Z-test at .05 level of significance showed a value equal to 3.17.

Table VI
The Difference of the National Achievement Test Results Between National and Vocational Secondary Schools

Statistics	National High Schools	Vocational Secondary Schools
N	986	484
Mean	78.97	79.73
SD	3.94	4.27
Alpha level of significance		.05
Tabulated Z-value		1.96
Computed Z-value		3.17
Interpretation		Significant

Hence, the null hypothesis that there was no significant difference between the national achievement test results of the national and vocational secondary schools was rejected. This meant that there was a significant difference between the results of the national and vocational secondary schools in the said test.

The results further showed that students who came from vocational secondary schools performed better in the test than those who came from national high schools. This would imply that the curriculum and instruction of vocational secondary schools were more responsive to the learning needs of students as compared to the national high schools.

A summary table for the determinants affecting national achievement test results is shown.

Table VII
Summary of the Determinants Influencing the National Achievement Test Results

Determinants	df	Tabulated Value	Computed Value	Interpretation
Age	2	5.991	13.92	Significant
Gender	2	5.991	53.45	Significant
School Population	2	5.991	7.16	Significant

CONCLUSIONS

Senior students from the secondary schools in the province of Biliran obtained an above average performance in the national achievement test. Age and gender of senior students as well as the size of the secondary schools they attended were significant determinants influencing the results of the said test. Vocational secondary schools performed better than the national high schools in the same test.

RECOMMENDATIONS

Concerned school principals and administrators should exert more efforts in order to improve further their performance in national achievement test. Considering age and gender of students as significant determinants influencing the results of the national achievement test, special classes and remedial instructions for the low achievers should be provided. Since size of school matters in the national achievement test, secondary schools which are situated in one municipality

should be integrated especially if the distance is very manageable, favourable and accessible. While vocational secondary schools performed better than the national high schools in the said test, the latter should adapt the administration, supervision of instruction and curriculum of the former.

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