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ACHIEVEMENT TEST AND ACADEMIC PERFORMANCE IN MATHEMATICS OF SECOND YEAR HIGH SCHOOL STUDENTS IN THE DIVISION OF ZAMBALES, PHILIPPINES

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ABSTRACT

The study aimed to determine the performance of twelve thousand six hundred twenty-six(12,626) second year students of selected high schools in the Division of Zambales in the National, Regional and Division Achievement Tests in relation to academic performance in Mathematics during the school year 2005-2006 to 2009-2010.The descriptive research design was used in the documentary analysis of the National, Regional, and Division Achievement Test results, and the Academic Grades obtained from the Division Office of the Department of Education. Most of the students who took the test are young adolescent males. The mean academic performance in Mathematics during the school year 2005-2006 to 2009-1010 was 80.02 %, rated Fair. The students obtained Low Mastery (from 2005-2006 to 2008-2009) and Average Mastery (2009-2010) in the National Achievement Test (NAT). Average Mastery was obtained in the Regional Achievement Test (RAT) from school year 2005-2006 to 2009-2010. Average Mastery was also obtained in the Division Achievement Test (DAT) from school year 2007-2008 to 2009-2010. There was no significant difference in the NAT, RAT, and DAT results when grouped according to age and sex of students respectively. There was no significant relationship between academic performance and the NAT, RAT, and DAT results respectively. It is recommended that an assessment of students' strengths and weakness in the different test areas should be conducted. The teachers should provide intensive and rigorous coaching to students with low academic performance in Mathematics before the National, Regional and Division Achievement Tests. The teachers should attend seminar-workshops on the use of appropriate teaching methodologies in order to improve their teaching craftsmanship in Mathematics. The teachers should also collaborate with the parents to encourage students' perseverance, determination, and dedicated practice in learning Mathematics. A parallel study with inclusion of different teaching styles and motivational techniques should be conducted to validate the findings of this study.

INTRODUCTION

Teaching and learning Mathematics is very interesting and challenging both on the part of the teacher and the student. Mathematics is often perceived as a difficult subject, and it is a great challenge for teachers to change students' perception towards this subject. This is because very few have truly learned Math and many have struggled through the courses. The work of Schoenfeld indicated that many students feel that Math has little or no relation to the real world (cited in Fan and Zhu, 2008). To some, solving Math questions has no relation to the problems they encounter in their daily lives. Many lower-achieving students get confused if they see more than one way to solve a problem.

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Teachers also have concerns about the limitations of their knowledge (Fan, 2008). Math is precise, requires exact execution, and the answers are either right or wrong (Boley, 1999). The starting point for the development of children's creativity and skills should be established concepts and algorithms. Success in mathematics needs to be grounded in well-learned algorithms as well as understanding of the concepts (Ross, 1997; Wu, 1999).Students are provided with only half of the information needed to properly solve Math problems by simply following textbook in Math (Boley, 1999). Teachers need a profound understanding of fundamental Mathematics in order to teach Mathematics well (NCTM, 2000). The quality of learning is strongly related to quality of teaching done by the teacher (Lee-Chua, 2002). Tests are considered necessary instruments to evaluate the quality of learning (Borais and Barcena, 2009). Students in the

Philippines take the National Achievement Test (NAT), Regional Achievement Test (RAT) and Division Achievement Test (DAT) to measure students' skills and capabilities in key subjects that are crucial to the national education system. Standardized achievement tests like the NAT, RAT and DAT, assess subject proficiency (reading, math, written language, science and/or social studies) using highly structured testing procedures similarly taken by the students. Standardized tests are not perfect evaluation tools. Used validly and reliably, standardized tests provide decision-makers useful information that no other evaluation method can provide (Phelps, 2008).
The results of the National Achievement Test for Grade 3 and Grade 6 pupils (Doped Memo. No. 5, s 2008), and for Second Year high school students (Deped Memo. No. 467, s 2008) are not incorporated in the actual grades of the examinees. The test aimed to monitor the performance of schools, and to determine what the examinees know and can do in English, Science, Mathematics, Filipino and Social Studies (Deped Memo. No. 9, s. 2006).

Likewise the Regional Achievement Test for Elementary and Secondary Schools was administered through the Regional Memorandum No. 14, s. 2007 with the following objectives: (1) to determine the learning outcomes, (2) to identify the learners' strengths and areas for improvement, (3) to ensure that the competencies in the Basic Education Curriculum are covered and mastered by the learners, and (4) to determine the performance level of the learners. With the same objectives, the Division Mathematics Achievement Test was also administered (as per meeting with the Schools Division Superintendent, January 14, 2008). It consists of lessons from the first to fourth grading periods, twenty percent (20%) each from the first three grading periods and forty percent (40%) from the last grading lessons. Math is a subject that requires a proper sequence of preliminary courses at the beginning and build upon skills learned in the previous lesson. Without a complete understanding of these fundamental skills, a student's learning path may lead to failure or to an excessive amount of memorization. With an understanding of the fundamental principles of Mathematics, the learner can construct formula as needed and not have to depend upon a long list of procedures, each procedure applying to a particular problem or problem type (Mentor Products, Inc., n.d.). The study on the Achievement Test and Academic Performance in Mathematics of Second Year High School Students in the Division of Zambales was undertaken to assess the level of mastery of the competencies in Mathematics covered in the Basic Education Curriculum.

MATERIALS AND METHODS

The study focused mainly on the Achievement Test and Academic Performance in Mathematics of Second Year High School Students in the Division of Zambales during the school year 2005-2006 to 2009-2010.The study used the descriptive design. It was conducted in 16 public secondary schools in the Division of Zambales namely: Amungan High School, Bani National High School-Annex, Botolan Community High School, Cabangan High School, Castillejos National High School, Governor Manuel Barreto High School, La Paz High School-Main, Lauis High School, Lipay High School, Namatacan High School, Salaza High School-Extension, San Marcelino High School-Annex, San Marcelino High School-Main, San Miguel High School-Annex, Sta. Cruz National High School and Subic National High School. A total of 12,626 second year high school students were included as respondents. Copies of the results of the National and Regional, Achievement Tests in Mathematics during the school years 2005-2006 to 2009-2010, and the Division Achievement Test in Mathematics from 2006-2007 to 2009-2010 were obtained from Division Office of the Department of Education, Iba, Zambales with permission and approval of the Schools Division Superintendent. Copies of students' grades in Mathematics were also obtained from the respective schools with the assistance of school heads and school principals. The results of the National, Regional, and Division Achievement tests, and the students' grades in Mathematics were analyzed and were used to describe the ranking of the participating schools. The guide to the qualitative interpretation of the results in the National, Regional and Division Achievement tests is presented in Table 1.

Table 1. Qualitative Interpretation of the Results in the National, Regional, and Division Achievement Tests in Mathematics

Point	Weighted Value	Qualitative Interpretation
1	4 - 4%	Absolutely No Mastery
2	5 – 14%	Very Low Mastery
3	15 – 34 %	Low Mastery
4	35 – 65%	Average Mastery
5	66 – 85%	Moving Towards Mastery
6	86 – 95%	Closely Approximating Mastery
7	96 – 100%	Mastered

The basis for the qualitative interpretation of the academic performance in Mathematics is presented in Table 2.

Table 2. Qualitative Interpretation of the Results in the National, Regional, and Division Achievement Tests in Mathematics

Final Grade	Interpretation
65 – 74	Very Poor
75 – 79	Poor
80 – 84	Fair
85 – 89	Good
90 – 94	Very Good
95 – 99	Outstanding
100	Excellent

The relationship between the grades and the results of the National, Regional, and Division Achievement tests was described using the Pearson-r correlation coefficient. The significance of the correlation coefficient was determined using the t-test. The correlation coefficient values are interpreted as follows (Calmorin, 2004):

- An r from 0.00 to ± 0.20 denotes negligible correlation.
- An r from ±0.21 to ± 0.40 denotes low or slight correlation.
- An r from ±0.41 to ± 0.70 denotes marked or moderate relationship
- An r from ±0.71 to ± 0.90 denotes high relationship
- An r from ±0.91 to ± 0.99 denotes very high relationship

RESULTS AND DISCUSSION

Profile of Students

The profile (Table 3) indicate that largest group of students comprising 69.31 % (or 8751) belong to the age bracket 13 ¼ to 14 ¾, being the "age-entry" level for second year high

school students. The smallest group comprising 0.023% (or 3) belong to the age bracket 27 ¼ to 28 ¾ years old. The mean age is 14.92 years. Regardless of age, all students can learn mathematics and deserve the opportunity to do so (Sutton and Krueger, 2002).

Table 3. Distribution of Students According to Age

Age (years)	Frequency	Percentage
13 ¼ to 14 ¾	8751	69.31
15 ¼ to 16 ¾	2015	15.95
17 ¼ to 18 ¾	1840	14.57
19 ¼ to 20 ¾	4	0.031
21 ¼ to 22 ¾	3	0.023
23 ¼ to 24 ¾	6	0.047
25 ¼ to 26 ¾	4	0.031
27 ¼ to 28 ¾	3	0.023
Total	12626	100.00

The distribution according to sex (Table 4) shows that there are more male (50.80 % or 6408) than female (49.20 % or 6218) students.

Table 4. Distribution of Students According to Sex

Sex	Frequency	Percentage
Male	6,408	50.80
Female	6,218	49.20
Total	12,626	100.00

Research on sex differences, its causes and consequences is not only of academic interest, but concerns general academic policy.

Sex differences in Mathematics performance and ability remain a concern. Scientists seek to address the underrepresentation of women at the highest levels of Mathematics, the physical sciences, and engineering (Halpern, Benbow, Geary, Gur, Hyde, and Gernsbacher, 2007). Stereotypes that girls and women lack Mathematical ability persist and are widely held by parents and teachers (Frome and Eccles, 1998; Furnham, Reeves, and Budhani, 2002; Li, 1999).

Academic Performance in Mathematics

The academic performance of students reported as the final grade in Mathematics is presented in Table 5. The final grades, described as Poor to Fair, ranged from 78.82 to 81.86 during the school year 2005-2006; 79.38 to 81.00 (2006-2007); 79.31-80.58 (2007-2008); 79.38 to 81.21 (2008-2009); and 78.92 to 81.66 (2009-2010).Averaged over five school years, the top five schools are Namatacan High School (1st), Lipay High School (2nd), Lauis High School (3rd), San Marcelino High School-Annex (4th), and Amungan High School (5th).The final grade averaged over five school years ranged from 79.30 to 80.84 described as Poor to Fair. The poor performance of Filipino students in mathematics is caused by poor inputs into the teaching-learning process. The basic problem in learning mathematics in the Philippines is how to facilitate the learning process. Students are usually exposed to mental computations but seldom to constructing and relating concepts to prior knowledge and experiences, or applying the same concepts to real world problems (Bernardo, 2000)

Performance in the National Achievement Test in Mathematics

The mean percentile score (MPS) in the National Achievement Test (NAT) in Mathematics (Table 6) is a measure of the student's level of mastery. The MPS values ranged from 29.99 to 43.59 during the school year 2005-2006; 21.61 to 49.83 (2006-2007); 24.57 to 55.23 (2007-2008); 26.97 to 37.69 (2008-2009); and 24.75 to 57.88 (2009-2010) indicating low to average mastery. Averaged over five years, the top five schools based on the MPS are Namatacan High School (1st), San Marcelino High School-Annex (2nd), Salaza High School-Extension (3rd), Sta. Cruz National High School-Annex (4th) and San Marcelino High School-Main (5th). The MPS averaged over five school years ranged from 28.74 to 41.88 indicating Low to Average mastery.

Table 5. Academic Performance of Students in Mathematics

Name of School	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Mean (5 yrs)	Academic Performance
Amungan HS	79.51	81.00[1st]	80.58[1st]	79.99	80.05	80.23[5th]	Fair
Bani NHS-Annex	78.82	79.72	79.57	79.44	80.36[5th]	79.58	Fair
Botolan Community HS	79.83	79.98	79.40	79.54	79.92	79.73	Fair
Cabangan HS	79.89[5th]	80.21	79.76	79.98	79.74	79.92	Fair
Castillejos NHS	79.61	79.51	79.86	79.58	79.68	79.65	Fair
Gov. Manuel Barreto HS	79.45	79.40	79.35	79.38	78.92	79.30	Poor
La Paz HS-Main	80.66[3rd]	80.87[3rd]	79.96	80.12	80.33	80.39	Fair
Lauis HS	81.55[2nd]	80.84[4th]	79.89	80.50[4th]	79.60	80.48[3rd]	Fair
Lipay HS	79.61	80.71[5th]	80.54[2nd]	81.21[1st]	81.66[1st]	80.74[2nd]	Fair
Namatacan HS	81.86[1st]	80.00	80.37[3rd]	80.67[2nd]	81.29[3rd]	80.84[1st]	Fair
Salaza HS-Extension	79.60	80.08	80.15[5th]	80.18	79.92	79.98	Fair
San Marcelino HS-Annex	79.78	79.38	80.16[4th]	80.58[3rd]	81.46[2nd]	80.27[4th]	Fair
San Marcelino HS-Main	80.10[4th]	79.39	79.91	80.29[5th]	79.42	79.82	Fair
San Miguel HS-Annex	79.82	80.99[2nd]	79.93	80.12	79.58	80.09	Fair
Sta. Cruz NHS	79.04	79.39	79.83	80.01	80.48[4th]	79.75	Fair
Subic NHS	79.25	79.45	79.31	79.70	79.91	79.52	Fair
Mean	79.90	80.06	79.91	80.08	80.15	80.02	
Academic Performance	Fair	Fair	Fair	Fair	Fair	Fair	

A written test as a means of diagnosing children's difficulties has disadvantages (Ellerton and Olson, 2005) especially when the language of the test is not the child's first language (Abedi, 2000).

Performance in the Regional Achievement Test in Mathematics

The mean percentile score (MPS) in the Regional Achievement Test (RAT) in Mathematics is presented in Table 7. The MPS indicating average mastery to moving towards mastery, ranged from 27.34 to 69.09 during the school year 2005-2006; 36.02 to 71.53 (2006-2007); 45.14 to 75.24 (2007-2008); 47.26 to 70.32 (2008-2009); and 48.74 to 74.45 (2009-2010).

Table 6. Mean Percentile Score (MPS) in the National Achievement Test in Mathematics

Name of School	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Mean (5 yrs)	Level of Mastery
Amungan HS	34.69[3rd]	25.91	46.04[4th]	30.40	31.13	33.63	Low
Bani National HS-Annex	30.82	26.46	40.53	30.82	28.16	31.36	Low
Botolan Community HS	34.39[5th]	33.68	28.80	28.44	29.99	31.06	Low
Cabangan HS	33.68	33.94[5th]	34.58	30.53	27.02	31.95	Low
Castillejos NHS	33.90	32.93	33.43	34.12[4th]	39.20	34.72	Average
Gov. Manuel Barreto HS	29.99	21.61	40.73	28.40	35.88	31.32	Low
La Paz HS-Main	31.41	27.37	32.25	27.75	34.45	30.65	Low
Lauis High School	43.59[1st]	26.42	36.67	27.37	35.82	33.97	Low
Lipay High School	30.88	29.50	28.87	29.75	30.43	29.89	Low
Namatacan HS	32.75	46.71[2nd]	45.50[5th]	37.69[1st]	46.73[2nd]	41.88[1st]	Average
Salaza HS-Extension	30.20	38.03[3rd]	55.23[1st]	35.24[2nd]	45.42[3rd]	40.82[3rd]	Average
San Marcelino HS-Annex	41.64[2nd]	49.83[1st]	24.57	32.50[5th]	57.78[1st]	41.26[2nd]	Average
San Marcelino HS-Main	34.38	35.13[4th]	47.50[3rd]	34.47[3rd]	24.75	35.24[5th]	Average
San Miguel HS-Annex	32.02	28.12	25.90	29.73	27.92	28.74	Average
Sta. Cruz National HS	30.88	31.27	50.65[2nd]	30.88	40.35[5th]	36.81[4th]	Average
Subic NHS	34.52[4th]	27.30	40.96	26.97	43.50[4th]	34.65	Average
Mean	33.73	32.14	38.26	30.94	36.16	34.25	
Level of Mastery	Low	Low	Average	Low	Average	Low	

Table 7. Mean Percentile Score (MPS) in the Regional Achievement Test in Mathematics

Name of School	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Mean (5 yrs)	Level of Mastery
Amungan HS	34.70	36.02	58.81[4th]	65.90[3rd]	74.45[1st]	53.98	Average
Bani National HS-Annex	30.82	54.46	56.20	57.98	58.10	51.51	Average
Botolan Community HS	30.00	42.50	47.43	47.68	55.24	44.57	Average
Cabangan HS	27.52	64.56[3rd]	62.95[3rd]	47.26	48.74	50.21	Average
Castillejos NHS	27.34	59.20[5th]	53.64	60.54	56.96	51.54	Average
Gov. Manuel Barreto HS	32.30	71.53[1st]	56.59[5th]	64.72[4th]	57.90	56.61[4th]	Average
La Paz HS-Main	32.00	55.08	45.14	51.82	51.22	47.05	Average
Lauis High School	55.35[3rd]	45.40	54.69	55.63	52.79	52.77	Average
Lipay High School	69.09[1st]	71.17[2nd]	51.84	56.40	68.66[2nd]	63.43[1st]	Average
Namatacan HS	39.00[5th]	56.12	54.62	58.50	58.36	53.32	Average
Salaza HS-Extension	28.28	50.97	67.03[2nd]	61.60	57.36	53.05	Average
San Marcelino HS-Annex	37.03	40.06	53.38	66.62[2nd]	62.80[4th]	51.98	Average
San Marcelino HS-Main	65.86[2nd]	56.40	55.83	54.56	65.56[3rd]	59.64[2nd]	Average
San Miguel HS-Annex	41.60[4th]	60.72[4th]	51.53	64.62[5th]	58.00	55.29[5th]	Average
Sta. Cruz National HS	33.32	59.12	75.24[1st]	70.32[1st]	54.06	58.41[3rd]	Average
Subic NHS	32.50	42.26	52.81	60.70	60.50[5th]	49.75	Average
Mean	38.54	54.10	56.11	59.05	58.79	53.32	
Level of Mastery	Average	Average	Average	Average	Average	Average	

Table 8. Mean Percentile Score (MPS) in the Division Achievement Test in Mathematics

Name of School	2007-2008	2008-2009	2009-2010	Mean (5 yrs)	Level of Mastery
Amungan HS	53.81	69.12[1st]	71.58[1st]	64.84[2nd]	Average
Bani National HS-Annex	58.64[5th]	52.30	65.58[5th]	58.84	Average
Botolan Community HS	56.14	50.82	45.86	50.94	Average
Cabangan HS	68.12[2nd]	63.23[2nd]	62.62	64.66[3rd]	Average
Castillejos NHS	50.92	58.36[5th]	56.58	55.29	Average
Gov. Manuel Barreto HS	55.13	52.18	64.16	57.16	Average
La Paz High SH	53.61	53.80	56.66	54.69	Average
Lauis High School	54.67	49.34	48.23	50.75	Average
Lipay High School	47.71	47.64	53.38	49.58	Average
Namatacan HS	57.52	50.14	56.14	54.60	Average
Salaza HS-Extension	53.74	53.04	58.00	54.93	Average
San Marcelino HS-Annex	54.92	58.46[4th]	70.46[2nd]	61.28[4th]	Average
San Marcelino HS-Main	58.65[4th]	53.54	45.37	52.52	Average
San Miguel HS-Annex	49.78	58.07	53.82	53.89	Average
Sta. Cruz National HS	76.95[1st]	60.38[3rd]	70.06[3rd]	69.13[1st]	Moving towards mastery
Subic NHS	60.44[3rd]	57.03	66.00[4th]	61.16[5th]	Average
Mean	56.92	55.47	59.03	57.14	
Level of Mastery	Average	Average	Average	Average	

Averaged over five years, the top five schools based on the MPS are Lipay High School (1st), San Marcelino High School-Main (2nd), Sta. Cruz High School-Extension (3rd), Gov. Manuel Barreto High School (4th), and San Miguel High School-Main (5th). The MPS averaged over five school years ranged from 44.57 to 63.43 indicating Average mastery. Mathematics achievement is closely linked to the successful establishment of foundation skills in number sense in the first years of schooling. Higher level conceptual structures depend on core concepts typically acquired at age 5 or 6. Students whose core structure is not in place at the expected age will have difficulty catching up (Griffin, 2004).

Performance in the Division Achievement Test in Mathematics

The mean percentile score (MPS) in the Division Achievement Test (DAT) in Mathematics is presented in Table 8. The MPS indicating average mastery to moving towards mastery ranged from 47.71 to 76.95 during the school year 2007-2008; 47.64

to 69.12 (2008-2009); and 45.37 to 71.78 (2009-2010). Averaged over three school years, the top five schools based on the MPS are Sta. Cruz National High School (1st), Amungan High School-Main (2nd), Cabangan High School (3rd), San Marcelino High School-Annex (4th), and Subic High School-Main (5th). The MPS averaged over three school years ranged from 49.58 to 69.13 indicating average mastery to moving towards mastery. Those who understand and can do mathematics have significant opportunities and options for shaping the future (NCTM, 2000). Mathematics literacy has several dimensions that include numerical literacy, spatial literacy, and data literacy and extends beyond the classroom to other fields of study.

Table 9a. Analysis of Variance on the Difference in the Performance in the National, Regional, and Division Achievement Tests in Mathematics as Affected by Age of the Students

Age Profile Variable	SS	df	MS	F	p	Decision	Interpretation
National Achievement Test	2.3585	2	1.1792	0.0262	0.9741	Accept Ho	Not Significant
Regional Achievement Test	750.18	2	375.09	2.4262	0.0884	Accept Ho	Not Significant
Division Achievement Test	264.16	2	132.08	2.4094	0.0899	Accept Ho	Not Significant

Marked effects are significant at p < .05000

Table 9b. Analysis of Variance on the Difference in the Performance in the National, Regional, and Division Achievement Tests in Mathematics as Affected by Sex of the Students

Sex Profile Variable	SS	df	MS	F	P	Decision	Interpretation
National Achievement Test	28.068	1	28.0686	0.62381	0.42964	Accept Ho	Not Significant
Regional Achievement Test	56.874	1	56.8746	0.36779	0.54422	Accept Ho	Not Significant
Division Achievement Test	0.5922	1	0.59229	0.0108	0.91723	Accept Ho	Not Significant

Marked effects are significant at p < .05000

Table 10. Relationship between the Level of Students' Academic Performance and the Results in the NAT, RAT, and DAT in Mathematics

Name of School	NAT	Grade	RAT	Grade	DAT	Grade
Sta. Cruz NHS	36.81	79.75	58.41	79.75	69.13	79.75
Lipay HS	29.89	80.74	63.43	80.74	49.58	80.74
Lauis HS	33.97	80.48	52.77	80.48	50.75	80.48
Bani NHS-Annex	31.36	79.58	51.51	79.58	58.84	79.58
Amungan HS	33.63	80.23	53.98	80.23	64.84	80.23
Botolan Community HS	31.06	79.73	44.57	79.73	50.94	79.73
Cabangan HS	31.95	79.92	50.21	79.92	64.66	79.92
Gov. Manuel Barreto HS	31.32	79.3	56.61	79.3	57.16	79.3
Namatacan HS	41.88	80.84	53.32	80.84	54.6	80.84
La Paz HS-Main	30.65	80.39	47.05	80.39	54.69	80.39
San Miguel HS-Annex	28.74	80.09	55.29	80.09	53.89	80.09
San Marcelino HS-Main	35.24	79.82	59.64	79.82	52.52	79.82
San Marcelino HS-Annex	41.26	80.27	51.98	80.27	61.28	80.27
Castillejos NHS	34.72	79.65	51.54	79.65	55.29	79.65
Subic NHS	34.65	79.52	49.75	79.52	61.16	79.52
Salaza HS-Extension	40.82	79.98	53.05	79.98	54.93	79.98
Pearson-r	0.216		0.184		-0.323	
t-computed	0.926		0.699		1.275	
t-tabular (α=0.05, df =14)	1.761		1.761		1.761	
Interpretation	No significant relationship		No significant relationship		No significant relationship	

The results of the NAT, RAT, and DAT are not significantly different when grouped according to age as indicated by the p-value greater than 0.05 (Table 9a). Adolescent students vary greatly in their development and readiness for learning. Teachers play a critical role in judging the developmental stage of each student. The teachers should also establish rich environments through which students can explore mathematics at an appropriate level (Reys, Lindquist, Lambdin, Smith & Suydam, 2003). The stage of adolescence is a time where students exhibit lapses in attention primarily because of anxieties or simply because of lack of interest in the subject, boredom or fatigue (Mastropieri and Scruggs, 2000). The NAT, RAT, and DAT are not significantly different when grouped according to sex as indicated by the p-value greater than 0.05 (Table 9b). A study about gender difference in mathematics performance found that boys and girls show similar interest in math during elementary school. However, during secondary school, boys are more interested in learning math than girls, and this difference tends to enlarge by adolescence (Wigfield, Battle, Keller, and Eccles, 2002).

Relationship between the Level of Students' Academic Performance and the Results in the NAT, RAT, and DAT in Mathematics

There is a low positive correlation (r = 0.216); no correlation (r = 0.184); and low negative correlation (r = -0.323) between students' academic performance and the results in NAT, RAT, and DAT in Mathematics respectively (Table 10). The t-tabular value (1.761) is greater than the t-computed values (0.926, 0.699, and 1.275), indicating no significant relationship between the students' academic performance and the results of NAT, RAT, and DAT in Mathematics respectively. Several factors like mental ability, attitudes of students towards mathematics and study habits significantly correlate with academic success especially in mathematics. Other factors like personality traits, problem-related reasons, time management, teacher's attitude, self-esteem and test anxiety are also contributory factors to performance of students. Reading deficiencies lead to mathematics deficiencies due to the

inability to understand word problems and mathematical language (Silva, Tadeo, Delos Reyes and Dadigan, 2006).

Conclusion

Most of the students who took the test are young adolescent males. The mean academic performance in Mathematics during the school year 2005-2006 to 2009-1010 was 80.02 %, rated fair. The students obtained Low Mastery (from 2005-2006 to 2008-2009) and Average Mastery (2009-2010) in the National Achievement Test (NAT). Average Mastery was obtained in the Regional Achievement Test (RAT) from school year 2005-2006 to 2009-2010. Average Mastery was also obtained in the Division Achievement Test (DAT) from school year 2007-2008 to 2009-2010. There was no significant difference in the NAT, RAT, and DAT results when grouped according to age and sex of students respectively. There was no significant relationship between academic performance and the NAT, RAT, and DAT results respectively.

Recommendations

It is recommended that an assessment of students' strengths and weakness in the different test areas should be conducted. The teachers should provide intensive and rigorous coaching to students with low academic performance in Mathematics before the National, Regional and Division Achievement Tests. The teachers should attend seminar-workshops on the use of appropriate teaching methodologies in order to improve their teaching craftsmanship in Mathematics. The teachers should also collaborate with the parents to encourage students' perseverance, determination, and dedicated practice in learning Mathematics. A parallel study with inclusion of different teaching styles and motivational techniques should be conducted to validate the findings of this study.

REFERENCES

Bernardo, A. B. 2000. Teachers: The Problem of Learning and Reform in Mathematics and Science Education. Fusion, 2.Malate, Manila.

Boley, B. 1999. How to Teach Math to Students Having Difficulty.Retrieved on March 29, 2015 from http://www.oddparts.com/missions/math.htm.

Borais, D. B. & Barbacena, L.B. 2009. Portfolio Assessment in Mathematics IV: An Analysis. In: Proceedings of An International Conference on Mathematics Education. October 23-24 2009. Palawan State University. Puerto Princesa, Palawan, Philippines. Pp 52-61.

Calmorin, L. 2004. Educational Measurement and Evaluation. 24 K Printing Co. Inc.

Ellerton, N. F., & Olson, J. 2005. The assessment dilemma: Correct answers with no understanding and incorrect answers with some understanding. In H. S. Dhindsa, I. J. Kyeleve, O. Chukwu & Q. P.J.H.S. (Eds.), *Future directions in science, mathematics and technical education* (pp. 226-235).Bandar Seri Begawan, Brunei Darussalam: Universiti Brunei DarussalamGriffin, S. (2004). Teaching number sense.*Educational Leadership*, 61(5), 39–42.

Fan, L. (Ed.). 2008. Performance assessment in Mathematics: Concepts, methods, and examples of research and practice in Singapore classrooms, National Institute of Education, Singapore.

Fan, L. and Zhu, Y. 2008. Using Performance Assessment in Secondary School Mathematics: An Empirical Study in a Singapore Classroom. Journal of Mathematics Education December 2008, Vol. 1, No. 1, pp. 132-152

Frome, P. M. and Eccles, J. S. 1998. Parents' influence on children's achievement-related perceptions. *J Pers Soc Psychol*. 1998 Feb; 74(2):435-52.

Furnham, A., Reeves, E., Budhani, S. 2002. Parents think their sons are brighter than their daughters: sex differences in parental self-estimations and estimations of their children's multiple intelligences. *J Genet Psychol.* 163(1): 24-39.

Griffin, S. 2004. Teaching number sense.*Educational Leadership*, 61(5), 39–42.

Halpern, D.F., Benbow, C. P., Geary, D.C., Gur, R.C., Hyde, J.S. and Gernsbacher, M.A. 2007. The Science of Sex Differences in Science and Mathematics. Psychological Science in the Public Interest. August 2007. 8: 1-51.

Lee-chua, Q.N. 2002. US Science Chief's thought on Math, *The Philippine Journal of Education*, page 109.

Li, Q. 1999. Teachers' beliefs and gender differences in mathematics: A review. *Educational Research*. 41(1): 63-76.

Mastropieri, M.A. and Scruggs, T.E. 2000. Strategies of Effective Instruction. N.J: Prentice-Hall, Inc.

Mentor Products, Inc. (n.d.). The Status of Mathematics Education in the United States. Retrieved on March 29, 2015 from http://mentorproducts.com/about.html

National Council of Teachers of Mathematics. 2000. *Principles and standards for school mathematics*. Reston, VA: Author.

Phelps, R. P. 2008. The Role and Importance of Standardized Testing in the World of Teaching and Training. Nonpartisan Education Review / Essays, Vol.4, No.3

Reys, R., Lindquist, M., Lambdin, D., Smith, N., &Suydam, M. 2003. *Helping children learn mathematics*(7th ed.). Hoboken, NJ: Wiley.

Ross, K. 1997. Mathematical Association of America President's Task Force on the NCTM Standards.

Silva, D.L., Tadeo, M.C., Delos Reyes, C.R.V., and Dadigan, R.M. 2006. Factors Associated with Non-Performing Filipino Students in Mathematics: A Vision of Student's Cognitive and Behavior Management. In: *Proceedings of the 2nd IMT-GT Regional Conference in Mathematics, Statistics, and Applications*. Universiti Sains Malaysia. Penang, Malaysia. June 13-15, 2006.

Sutton, J. and Krueger, A. (Eds.). 2002. *Thoughts: What we know about mathematics teaching and learning*. Aurora, CO: Mid-continent Researchfor Education and Learning.

Wigfield, A., Battle, A., Keller, L. B. and Eccles, J. S. 2002. Sex Differences In Motivation, Self-Concept, Career Aspiration, And Career Choice: Implications For Cognitive Development. Biology, Society, And Behavior: The Development Of Sex Differences In Cognition, Mcgillicuddy-. De Lisi, A., De Lisi, R.(Eds.) (Pp. 92–124). New York: Ablex Publishing.

Wu, H.H. 1999. Response to NCTM's Commission on the Future of the Standards.Basic Skills vs. Conceptual Understanding; a Bogus Dichotomy; American Educator.

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