Numeracy Level of Elementary Students: Factors and Effects

Jerwin S. Tanghal [1], Analiza B. Tanghal [2*]

[1] Sto. Niño Elementary School – Deped Cabanatuan, Philippines
[*2] Nueva Ecija University of Science and Technology, Philippines

For correspondence: tanghal.analiza@neust.edu.ph

ABSTRACT

The study used stratified random sampling in selecting the respondents. There were seven Grade 6 sections with a total of 785 respondents (402 male and 383 female) who participated in the study. The data obtained were processed through Strata using the following statistical techniques: mean, weighted mean and Pearson product-moment correlation. Results revealed that 403 out of 785 (51.34%) of the pupil respondents belonged to the non-numerates group. The study found that sex, family size, and study habits had a significant relationship to the numeracy level of the respondents. The study also revealed that engaging with gadgets/devices like cell phones, cable TV, social media sites like Facebook, YouTube and online gaming sites had a negatively significant relationship to the numeracy level of the grade 6 pupils. The researcher recommends that teachers and parents should guide and teach the students for the responsible use of technology. The use of modern technology is very helpful in doing assignments, projects and research papers but it has a negative impact if the students used the technology for entertainment and socialization purposes. School administrators should provide a long-term program regarding students' involvement in extra-curricular activities. Provide seminars and training for the parents on how to support, encourage and help their children in their studies and develop their numeracy skills.

Keywords: environmental factors, numeracy level, socio-demographic characteristics.

1. INTRODUCTION

Teaching is the noblest profession in the whole world. We accept the scenario "*that no one can be an engineer, doctor, lawyer, architect, etc. without the help of teachers*". Teachers are the molders of the future. There is a big task on our shoulder if we are one of the educators.

Teaching is considered a complex and many-sided task. The teacher's major task is to guide learning [1]. Nevertheless, but he also has another responsibility among these are sharing responsibility in counselling and guidance, sponsoring extra class activities, working with parents and community, and observing professional endeavors [2]. To prepare for this job, the

future teacher goes through a pre-service education. Equally important is the in-service education pursued by one who is already in the field. Knowledge of ethical standards for teachers is likewise important for them to do a good teaching job.

Learning is more fun and exciting if the rapport environment inside the classroom is existing. Students and teacher's relationship should be first to develop to come out the good environment inside the classroom [3]. It prevents the pressure and anxiety happen in the students that can directly affect their academic performance.

Beside from teachers and environment, parents are the most influential factor to the students to perform well inside the classroom. They serve as the first teacher like the mother of our national hero Jose Rizal. They also provide the emotional and financial support needs by students [4]. On time passing of projects and paying financial obligation of students was served as motivation of the students to do their school projects and join school activities.

Pascua and Dulos (2020) stated that the academic performance of the pupils is high, probably because it is related to the frequency of collaboration of teachers and parents in terms of school-based activities and home-based activities [5]. Parent-teacher partnerships were emphasized to be an effective means of fostering students' success in a well-managed classroom environment.

Based on the Trends International Mathematics and Science Survey (TIMSS), wherein the Philippines was evaluated for the 8th Grade in 1999, it was reported that the Philippines was one of the 34 participating nations in which eight-grade boys and girls performed similarly in mathematics. The Philippines was third from the bottom of the participating countries. The Philippines

got 345 points as compared to Singapore having 604 points for Mathematics. The two lower countries were Morocco (337) and South Africa (275). For Science, the same pattern emerged. Likewise, the average score of 4th and 8th Grades was 495 for mathematics in the 2003 TIMSS. The Philippines was again third from the bottom (358 points) while Morocco (347 points) and Tunisia (339 points) were the lowest among the countries participated. The Philippines did not participate in the 1995, 2007 and 2011 TIMSS.

The result of the performance shows a decline in the ability of Filipino students in mathematics. Furthermore, the result of National Achievement Test (NAT) is also continuing to decline. The researcher observed that how this student can solve the trigonometry, geometry, statistics, algebra or complicated problem solving if they do not know how to solve the one- or two-digits' number using the four fundamental operations in mathematics.

The above result of the performance of the students might be due to environment factors. The assumption that said factors may influence the numeracy level of grade 6 pupils led to the undertaking of this study.

2. METHOD AND MATERIAL

2.1. Research Design

It covered the factors affecting numeracy level of Grade 6 Students in the selected schools in the Division of Cabanatuan City during the fourth quarter, school year 2019-2020, such as the Student, Family and Environment as the factors affecting the numeracy level of grade 6 pupils. The respondents are the selected grade 6 pupils in the Division of Cabanatuan.

2.2. Respondents of the Study

It utilized a total of 785 grade 6 pupil respondents or 2 public elementary school per cluster in the division of

Cabanatuan City during fourth grading period school year 2019-2020.

2.3. Instrumentation

It used the probability sampling particularly stratified random sampling where each school has an equal chance to become the sample from the population. There are four cluster in the Division of Cabanatuan City and each cluster is categorized base on their location (Rural or Urban). According to Crossman (2018) probability sample is a sample in which every unit in the population has a chance (greater than zero) of being selected in the sample, and this probability can be accurately determined. The combination of these traits makes it possible to produce unbiased estimates of population totals, by weighting sampled units according to their probability of selection. Probability sampling includes: Simple Random Sampling, Systematic Sampling, Stratified Sampling, Probability Proportional to Size Sampling, and Cluster or Multistage Sampling.

2.4. Data-gathering Procedure

In gathering data for this study, the researcher employed the questionnaire checklist as a tool to answer questions and yield to the desired results when properly and honestly filled up by the respondents. The data of the study used descriptive analysis using statistical tools like mean/average, weighted means, percentages, and frequencies to described the demographic characteristics, environment, and numeracy level of grade 6 pupils.

2.5. Statistical analysis

Pearson Product Moment Correlation was used to test for the significant relationships among the socio-demographic characteristics, environment and attitude factors to their academic performance in mathematics.

Analysis was conducted using Statistical Package for Social Sciences (SPSS). The level of significance was set at 0.05 level.

3. RESULT AND DISCUSSION

3.1. Socio-Demographic Characteristics

To address the first problem of the study, the description of the grade 6 pupil respondents in terms of their age, gender, place of residence, number of household members, family monthly income, lived with the parents, parents' educational attainment, and parents' occupation.

Age

Table 1 show that the age range was 11-14 years. Age was distributed in three (3) categories: below 11, 11-12 years and 13-14 years. The mean age of student respondents is 11.48 and majority of the respondents were 11-12 years of age (82.00%), followed by below 11 (10.7%) and 13-14 year (7.3%).

It also reveals that the parents today are aware to the importance of education because majority of the student respondents belonged to the age bracket of 11-12 and this age is the appropriate age for grade 6 pupils based on DepEd basic education age bracket.

Gender

Results of the study showed that majority of the pupil respondents were male (51.21%) and 48.79% were female. It only implied that the respondents were closely equal in terms of gender, to avoid biased and consider the fairness of distribution of information and data [6].

Distance of Residency from School

The table shows that most (39%) of the pupil respondents were residing near the school ranges from

Table 1. Distribution of grade 6 pupil respondents according to socio-demographic characteristics

CLASSIFICATION		Frequency (N = 785)	PERCENTAGE (%)
Age	Below 11	84	10.7
	11-12	644	82.0
	13-14	57	7.3
Gender	Male	402	48.79
	Female	383	
Distance of Residency from school	Below 2km	285	36.3
	2-4 km	306	39.0
	4-6km	131	16.7
	6-8km	63	8
	Above 8km	0	0
Numbers of Household members/family size	1-5	450	57.3
	6-10	283	36.0
	11-15	47	6.0
	16 & above	5	0.7
Mean	4.26		
Combined monthly income of the family (php)	Below 5000	135	17.3
	5001-10000	215	27.3
	10001-15000	251	32.0
	15001-20000	54	6.7
	20001-25000	73	9.3
	25000 above	57	7.3
Have you lived with your mother for past four years?	Yes	681	86.7
	No	104	13.3
Highest educational attainment of the mother	Elementary	100	12.7
	Secondary	414	52.7
	College	461	33.3
	Masteral/Doctoral	10	1.3
Mothers nature of occupation	Skilled	343	43.7
	Professional	121	15.3
	No work/seasonal work	321	41.0
Have you lived with your father for the last 4 years?	Yes	586	74.7
	No	199	25.3
Highest educational attainment of the father	Elementary	89	11.3
	Secondary	351	44.7
	College	324	41.3
	Masteral/Doctoral	21	2.7
Father's nature of occupation	Skilled	649	82.7
	Professional	84	10.7
	No work/seasonal work	52	6.75

2-4 km followed by below 2 km (36.3%), 4-6 km (16.7%) and 6-8 km (8%). The average distance from school to the residency of the student respondents was

2.24 km. The result revealed that most of students patronized the school near their residency. It also showed that the parents are more realistic and considerate for the budget for their children's education.

Number of Household members/Family size

The table shows that 450 out of 785 or 57.3% of the pupil respondents belonged to the small family with 1-5 family members, 36% belonged to the 6-10 family members followed by 11-14 members (6%) and 15-20 members (0.7%). The mean number of family members was 4.26. It revealed that families of the student respondents belonged to the average number of family members. They were open to adopt family planning and more concerned with the future of their children. Based on the Filipino Family Household: National Statistics Office (2006), an average family has five members in the

household and a small family has four or less members in the household [7].

Combined monthly income of the family

Table 2 shows that mean salary of the family was Php 11,275 and 32% of the pupil respondents were belonged to average monthly income (Php10,001-15,000); 27.3% were below average income (Php5,001-10,000); 17.3% were belonged to poor income (Php5,000-below); 6.7% was above monthly income (Php15,001-20,000); 9.3% was high income (Php 20,001-25,000); 7.3% was above high income (Php25,001-above). It implied that there were more poor families than rich ones in this study.

According to the National Statistics Office, Family Income and Expenditure Survey or FIES (2006), the average annual family income of Filipino families was Php 173,000 [7]. It only indicated that the annual income earned by the family of the student respondents was below average income. The results could be attributed to the parents' educational attainment as secondary graduates and most of the parents have no permanent work.

Respondents Living with the Mother

The table shows that 87.6% of the student respondents lived with their mother and 13.3 % did not. The result implies that the Filipino parents especially the mother is very caring in terms to their children.

Highest Educational Attainment of the Mother

The study reveals that majority (52.7%) to the mother of the student respondents were graduates of secondary level; 33.3% were graduates of college level; 12.7% were graduates of elementary level and 1.3% or 10 out of 785 were graduates of their Master's and Doctoral Degrees.

Mothers' Occupation

The table 2 shows that 43.7% of the student respondents' mother belonged to skill-natured occupation (Sewer, Farmer, Clerk and Secretary) followed by housekeeping (41%) and Professional (15.3%). The results revealed that most of the mother focused on caring for their families and served as the manager of their own homes. It also shows that most of the student respondents' mother worked together with the father to provide the financial need of the family.

Respondents living with the Father

The table shows that 74.7% of the student respondents lived with their father and 25.3% did not. The result implies that living with the father was lower than those with the mother because the father is usually the provider of the financial needs of the family. Many fathers leave their family and work abroad or to other places for their works.

Highest Educational Attainment of the Father

The study revealed that majority (44.7%) of the father of the student respondents were graduates of secondary level; 41.3% were graduates of college level; 11.3% were graduates of elementary level and 2.7% were graduates of their Master's and Doctoral Degree.

Father's Occupation

The table 2 shows that 82.7% of the student respondents father belonged to skill-natured occupation (Electrician, Automotive Mechanic, Farmer, Driver, Sewer, Janitor and Computer Technician) followed by professional (Teacher, Nurse, Doctor, Engineer, Accountant etc.) with 10.7% and 6.7% had no work because their fathers were already dead and had seasonal works.

3.2. Numeracy Level of Grade 6 Pupil Respondents

Table 2. Numeracy Level of Grade 6 Pupils in Numeracy Test		
Level	Frequency (N = 785)	Percentage (%)
Non-Numerates	403	51.34%
Nearly-Numerates	289	36.82%
Numerates	94	11.97%

The numeracy level in mathematics in any school level is a function with many factors. This includes student-related factors, teacher related factors, school related factors and home related factors. This study focused on the students-related factors such as age, gender, place of residence, number of household member, monthly income of the family, lived with the parents, educational attainment of the parents and parents' occupation and grades in mathematics of grade 8 student respondents.

In this study, the numeracy level referred to Result of Pre-Numeracy Test. It categorized as Non-numerates (0-49 pts.), Nearly numerates (50-74 pts.) and Numerates (75-100 pts.) of grade 6 pupil respondents during the school year 2019-2020.

The table 2 shows the numeracy level of grade 6 pupils using the pre-test of Numeracy test. Majority or 51.34% were belong to the non-numerates; 36.82 were nearly numerates and 11.97% were numerates. The result revealed that many of our pupils are need of intervention or programs in order to develop the skills of the pupils and improve their numeracy level.

3.3. Relationship between Socio-Demographic Characteristics and Numeracy Level of Grade 6 Pupils

To address the third problem of the study, the socio-demographic characteristics were correlated to numeracy level of the pupil respondents. Among the socio-demographic characteristics correlated, sex and family size were found to have significant relationship with the grade 6 pupil respondents' result of numeracy test.

Sex had $r = 0.263$, which means that sex has a highly significant relationship to the academic performance of the students. From studies found out that females perform better those males in English I as female learners tend to attain higher degree of education than males do [6]. Another study about mathematical performance of common first year in CLSU found out those female's students performed better than males [8]. Boys are generally playful at young age, while girls tend to be more serious for them early maturing. However, Costales (2006) found out that males are superior than females in terms of logical ability [9]. In contrary, studies found out that there's no significant relationship between the gender and the academic performance of the students [10-11].

Family size had $r = -0.228$. It means that family size has a negatively high significance to the numeracy level of the students. Family size and numeracy performance were inversely proportional in relationship. If the students have big family size, they have low performance in academics and vice-versa. This result was the same with the finding of Zajonc (1976) showing that the negative effect of family size on the students' intelligence were more pronounced among low and middle socio-economic status than those of high socio-economic status [12-13]. Parents with few children devote more time, money and affection to their academic performance.

Consequently, this result rejected the null hypothesis, "*There is no significant relationship between the socio-demographic characteristics and numeracy level of the grade 6 students in mathematics*".

Table 3 also reveals that age, distance of residency, family income, lived with the mother and father, parents' educational attainment and nature of parents' occupation were not related to academic performance in terms of final grades in mathematics. This means that these factors do not influence the academic performance of the grade 8 students.

It was also found out from previous study that there is a significant correlation with father's educational attainment and students' academic performance [14]. She also found out that the higher the educational attainment of the parents, the better academic performance in math the students have. On the other hand, Natriello (1986), opened that only mothers'

educational attainment had significant relationship with students NCEE performance [15].

3.4. Relationship between Environment and Numeracy Level of Grade 6 Pupils

Table 4-6 presents the environment factors (technology, extracurricular, media and study habits) were correlated with numeracy level in mathematics.

Based on the results, visiting networking sites such as Facebook had r = -0.169; YouTube had r = -0.176 and gaming sites (ML/Dota) had r = -0.191. It implies that these sites were inversely proportional to numeracy performance of grade 6 pupils. The more time they visit those sites the more chances of getting a low

Table 3. Relationship between socio-demographic characteristics and numeracy level in mathematics

Socio-demographic characteristic			f-significance	Decision
Age			-0.149	Accepted
Sex			0.263*	Rejected
Distance of Residency from School			0.064	Accepted
Family Size			-0.228*	Rejected
Combined Family Income			0.143	Accepted
Living with the Parents for past 4 years		Father	0.014	Accepted
		Mother	0.49	Accepted
Parents Educational Attainment		Father	0.143	Accepted
		Mother	0.126	Accepted

Table 4. Relationship between technology and academic performance in mathematics

Technology			f-significance	Decision
Device/Gadgets		Cell phones	-0.016*	Accepted
		Mp3/Mp4	-0.67	Accepted
		Cable TV	-0.016*	Rejected
		PSP	0.54	Accepted
		IPOD	-0.063	Accepted
		PC/Netbook/Laptop/Tablet	0.074	Accepted
Number of hours per day log in the internet			-0.091	Accepted
Number of days per week log in the internet			0.025	Accepted
Social Networking sites		Facebook	-0.021	Rejected
		Twitter	-0.169*	Rejected
		Google	-0.091	Accepted
		YouTube	-0.151	Rejected
		Gaming Site (ML/Dota)	-0.176*	Rejected
Number of text messages send in a day			-0.191*	Accepted

Table 5. Relationship between extracurricular and academic performance in mathematics

Extracurricular	f-significance	Decision
School Club	-0.385*	Rejected
Choir	0.030	Accepted
School Paper	-0.194*	Rejected
School sing/dance	-0.117*	Rejected
Contest	-0.086	Accepted
Sports	-0.361*	Rejected
Academic Contest		

performance in numeracy test.

The same findings of Alloway (2013), he found out that the networking sites, such youtube, gaming sites and especially facebook affects the academic performance of the high school students [16]. This finding was also supported by Walsh (2011), he found, college women spent nearly 12 hours using media per day, social networking were negatively associated with academic outcomes [17].

Similarly, the problem is that most people have Facebook of other social networking sites, their e-mails and maybe instant messaging constantly running in the background while they are carrying out other task, the students who used Facebook had grade point average of 3.06, which doesn't seem too bad when scales goes from 0.0 to 4.0 [18]. However, those who turned off the social media network when it came to hit the books had a typical GPA of 3.82. In addition, non-users also said they studied more often-spending an average of 88 percent

more time working outside of class. In addition, the device or gadgets of the students, number of hours and number of days in logging/surfing internet, role of the internet and number of texts send in a day were not related to academic performance of the students in mathematics. This meant that these factors were not influencing the academic performance of grade 8 students.

Table 4 shows that involvement in school clubs (r=0.385) and academic contest (r = -0.361) are highly negatively significant to performance in numeracy test and school paper had r=-0.194. In general, the overall Pearson Product Moment Correlation between extracurricular and numeracy level in mathematics was r = -0.311.

This result meant that involvement in extracurricular has a negative effect in numeracy test performance because the students used their time in practice and doing their organization activities instead of focusing to their studies.

Table 6 presents that type of media had r = 0.239 and this was highly correlated to the numeracy test performance in mathematics. It means that the types of media such as television, radio, magazine and internet used by the students influence the numeracy test performance of the pupils. It also reveals that the

Table 7. Relationship between study habit and numeracy level in mathematics

Study habits	f-significance	Decision
Time spent in doing and studying their lesson	0.197*	Rejected
Type of reference	0.032	Accepted

Table 8. Relationship between attitude factors and numeracy level in mathematics

Attitude factors		f-significance	Decision
Motivational Practices		0.260**	Rejected
Technology	0.085	Accepted	
Extracurricular	-0.078	Accepted	
Media	0.337**	Rejected	
Study habits	0.150	Accepted	

numbers of hours in watching TV in a day, number of days watching TV in a week, types of TV shows, hours that the numbers of hours in watching TV in a day, number of days watching TV in a week, types of TV shows, hours and days in listening radio and reading of newspaper do not affects the numeracy test performance of pupils in mathematics.

The result reveals that the hours spending in doing and studying their lessons had $r = 0.197$ is correlated to the numeracy test performance. It implies that the more time spent by the students in studying their lesson, the higher numeracy level in mathematics.

Hence, the null hypothesis which states, "There is no significant relationship between environment factors and academic performance in mathematics" was therefore rejected.

3.5. Relationship between Attitude Factors and Numeracy Level in Mathematics

To address the fourth problem of the study, the attitude factors (motivational practices, technology, extracurricular activities, media and study habits were correlated to academic performance of the respondents in Mathematics.

Numeracy level was found to be significantly correlated with attitude towards motivational practices of the family and attitude towards media with as r-value of 0.260 and 0.337. This finding implied that the numeracy level of grade 6 pupil respondents was directly influenced by their attitude towards motivational practices of the family and attitudes towards media. The concern; encouragement, guide, support and sacrifice of the family served as the motivation of the students to study and do their school works. The responsible use of media like TV, radio, magazine and newspaper served as the references of the students to do their school activities and assignments.

No relationships exist between attitudes towards technology ($r = 0.085$), attitudes towards extracurricular ($r = 0.078$) and attitudes towards study habits 9 ($r = 0.150$) with their numeracy level in mathematics.

The hypothesis which states, "*There is no significant relationship between attitude factors and numeracy level in mathematics*" was rejected. The findings implied that motivations came from the family such as help, support, concern, encouragement and financial support of the family was influenced the academic performance of the grade 8 students [19]. They were more active in participating and producing their projects, doing their homework because of the support came from the family.

4. CONCLUSION

Based on the result of the study, the following conclusions were drawn:

- Majority of the student respondents belonged to the age ranging 11.48 years old, majority to the respondents were male, the respondents reside near the school ranges from 2.24 km away from the school. Majority of the students were belonging to the small family members with 4.26 family members, most of the students were belonged to the average income of Php 11,275; majority of the respondents were lived with mother and father; the mother of respondents was graduate of secondary level; most of the student mother were skilled in terms of nature of occupation; most were graduate of secondary level and majority skilled in terms of nature of occupation.
- The study revealed that students are aware and exposed to the social media daily. It can be

assumed that these become helpful to them in making further studies. The time for study is lessened due to the temptation of social networking sites and surfing unrelated matters to students' lessons. Involvement of the students in extra-curricular it was directly attributed to only small amount of time is allotted to studying. Moreover, the parents' guidance and concern to their offspring's education improved the learners' motivation to attain higher in numeracy level.

- Majority of the pupils belonged to the Non-numerates with the score ranges 0-49. It implies that the respondents had a poor performance in numeracy test.

- Sex has a highly significant relationship to the numeracy level of the respondents. Female had high score in numeracy test compare to the male pupils. Family size has a negatively high significance to academic performance, where the bigger family size, the lower numeracy level.

- Involvement in school clubs has a negatively significant relationship to the performance in numeracy test where the more involvement in school clubs, school paper, school dance contest and academic contest, the lower numeracy test performance of pupils. Time spent in doing and study their lesson is correlated to numeracy test performance. The more time spent by students in doing and studying their lesson, the high scores in numeracy test.

- The type of media is highly correlated to numeracy test performance of the pupils. The more they expose to the media such television, radio, newspaper and internet the more they get the information and higher scores in numeracy test.

- Attitude towards motivation practices of family and media is correlated to numeracy test performance. More financial support,

encouragement and guide, the higher the scores in numeracy test.

5. ACKNOWLEDGEMENT

6. CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

7. SOURCE/S OF FUNDING

NA

8. REFERENCES

1. Nicholson, Hubert D. and Mozvis, Richard H. (2003), Exploration and Adjustment in High School Classroom: A Study of Person Environment Aid, *Journal of Educational Research*, **27**

2. Rosete, L.J. (1999). Mathematics performance of elementary schools in Division I of Pangasinan as Influence by selected Variables. Unpublished doctoral dissertation. Central Luzon State University, Science City of Munoz, Nueva Ecija

3. Salvatierra, Christina A. (2003), Pupils Perceptions of Teacher and Classroom Environment: Relationship to Attitude Towards Mathematics, *Journal of Educational Psychology*, Spring

4. Shaft, Ulrich and Ferrero, Charles (2005), Motivation and Ability factors in Mathematics Experience and Achievement, *Journal for Research in Mathematics Education*, **26***(2)*.

5. Pascua, V. V., & Dulos, C. C. (2020). Parents and Teachers' Collaboration on the Performance of Elementary Pupils in the Schools Division of Tarlac Province. *ASEAN Journal of Basic and Higher Education*, **2***(1)*

6. Boardman, M., Bullet, J. and Mayo, H. (2006). The impact of age and gender on Prep children's academic achievements. *Australian Journal of Early Childhood*, **31***(4)*.

7. Family Income and Expenditure Survey (Final Result) 2006. Income and Employment Statistics Division National Statistics Office Republic of the Philippines. Retrieved from https://psa.gov.ph/content/2006-family-income-and-expenditure-survey-final-results

8. Velasquez J.V. (2007). Teaching and Learning styles and academic performance of high school students in Mathematics, English and Science and Techniology. Unpublished masteral thesis, Central Luzon State University, Science City of Munoz, Nueva Ecija

9. Costales,S.M.P. (2006). Learning Styles, motivations and study habits and low performing secondary students. Implications to educatiobnal management. Unpublished masteral thesis. Central Luzon State University, Science City of Munoz, Nueva Ecija

10. Shkullaku, R. U. D. I. N. A. (2013). The relationship between self-efficacy and academic performance in the context of gender among Albanian students. *European academic research*, **1***(4)*: 467-478.

11. Abubakar, R. B., & Bada, I. A. (2012). Age and gender as determinants of academic achievements in college mathematics. *Asian Journal of Natural and Applied Sciences*, **1***(2)*.

12. Zajonc, R. B. (1976). Family Configuration and Intelligence: Variations in scholastic aptitude scores parallel trends in family size and the spacing of children. *Science*, **192***(4236)*: 227-236.

13. Osunloye, A. (2008). Family background and student academic performance. Unpublished masteral thesis. Central Luzon State University, Science City of Munoz, Nueva Ecija

14. Leoveras, M. E. C., & Dela, E. D (2021). Sociodemographic Characteristics and Learning Styles on Academic Performance in Science. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, **60***(5)*: 26-46

15. Natriello, G., & McDill, E. L. (1986). Performance standards, student effort on homework, and academic achievement. *Sociology of education*: 18-31.

16. Alloway, T. P., Horton, J., Alloway, R. G., & Dawson, C. (2013). Social networking sites and cognitive abilities: Do they make you smarter?. *Computers & Education*, **63**: 10-16.

17. Walsh, J. L., Fielder, R. L., Carey, K. B., & Carey, M. P. (2013). Female college students' media use and academic outcomes: Results from a longitudinal cohort study. *Emerging Adulthood*, **1***(3)***:** 219-232.

18. Stollak, M. J., Vandenberg, A., Burklund, A., & Weiss, S. (2011, February). Getting social: The impact of social networking usage on grades among college students. In Proceedings from ASBBS annual conference 18(1): 859-865.

19. Almerol, R.L. (2008). Extra-curricular activities and academic performance of college student leaders of Central Luzon State University and Nueva Ecija Science and Technology. Unpublished masteral thesis. Central Luzon state University, Science City of Munoz, Nueva Ecija