

Mathematics Achievement of Senior High School Students: Impact of Study Habits and Anxiety

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Abstract

This study focused on determining the significant influence of study habits and mathematics anxiety to the mathematics achievement of the senior high school students. Universal sampling was employed to 403 students enrolled to grade 12 senior high school at the Davao Oriental State College of Science and Technology taking accountancy, business and management (ABM) strand, humanities and social sciences (HUMSS) strand, science, technology, engineering and mathematics (STEM) strand, and technical-vocational-livelihood (TVL) strand. Results showed that the students' study habit and mathematics anxiety do not significantly differ across their field of specialization. It further revealed that mathematics achievement of the senior high school students was significantly correlated to and influenced by the level of their study habits, and mathematics anxiety. It was then recommended that activity designs in the classrooms should be made in such that way that it fosters positive ambiance to lessen the anxiety of the students towards the subject and boost their study habits.

Key Words: *Mathematics Achievement, Mathematics Anxiety, Senior High School, Study Habits*

Introduction

Mathematics is definitely one of the most-feared subjects. It however, remains to be one of the core foci from elementary to college and undeniably continues to be a part and parcel of our daily lives. Mensah (2013) opined that Mathematics plays a key role in shaping how individuals deal with the various spheres of private, social, and civil life. Through epochs, there have been scientific and educational researches that expended time and energy trying to unravel possible causes of students' mathematics achievement. And there are various factors that might affect students' mathematics achievement which involve teachers-related, family-related, peer-related, environment-related, and students-related factors (Moyana, 1996). In fact, Tezer and Bozkurt (2015) accentuated that nowadays, it is essential that mathematics is being studied and the fundamental aptitudes and capacities in learning this subject is grasped, since this is an efficient and dynamic tool that must be educated for the association and arrangement of our developing community.

Karakis (2013) purported that one of the primordial reasons behind academic failure is the students' deficiency in productive study habit and insufficiencies in acquiring such skills. He added that students who do not possess a good study habit could not endure to motivate themselves to learn and will eventually face low performance. On top of it is anxiety which is a

negative factor that makes learning harder and decreases the positive relation toward a certain subject (Tezer and Boskurt, 2015). Anxiety shows potential reason why students would fail in their studies as it prevents the students to learn and tends them to feel afraid while focusing in a particular task. On these premises, learners' anxiety and study habit would play a vital role in the achievement of the students in mathematics. In fact, James et al. (2013) concluded that anxiety should never be ignored by the students and teachers especially in learning mathematics as this may affect their mindset towards the subject. Numan and Hasan (2017) further posit that ineffective study habits can adversely reduce the mathematics achievement of the students which might lead them to come across with high level of anxiety.

In the Division of the City of Mati, records revealed the declining achievement of the students in the field of mathematics. It is depicted on the students' performance on their national career assessment examination (NCAE). In fact, results in NCAE 2016 showed mathematical ability just acquired 32.13, which is considerably the least mean percentage score amongst other general scholastic aptitude tests. This somehow explicates that the mathematical performance of the students in the City of Mati is still low.

Since the Philippines has just embraced the K-to-12 Curriculum, this would entail for adjustments in the contents and strategies to be delivered. Hence, exploring the Mathematics achievement of the Senior High School students is somehow timely. The furtherance in the exploration of the grounds for students' Mathematics achievement would be of great benefits to everyone who relentlessly trail for academic competence and professional growth. Emmanuel et al. (2014) even remarked that it is judicious to conduct studies related to the achievement among Senior High School Students' considering that it is the transition towards tertiary education. And more significantly, there were no ample research endeavors done for senior high school students especially in the Philippines. Hence, this study could be of great help then.

Research Objectives

This study aims to ascertain the dimensions of study behavior and mathematics anxiety which significantly influence the mathematics achievement of Senior High School Students. Specifically, it endeavors to do the following:

1. Determine the significant difference of the students' study habits and mathematics anxiety when analyzed across their field of specialization
2. Determine the significant relationship between the study habit and mathematics anxiety, and the Mathematics achievement the students.
3. Ascertain the significant influence on the study habits and mathematics anxiety to the Mathematics achievement of the students.

Literature Review

Study Habits

Study habit is the pattern of behavior adopted by students in the pursuit of their studies that serves as the vehicle of learning; the degree to which the student engages in regular acts of studying that are characterized by appropriate studying routines occurring in an environment that

is conducive to studying (Mendezabal, 2013). It is a behavior style that is systematically formed by students towards learning and achievement whether systematic, efficient or inefficient and the expanse of practices that a student exerts in particular period (Yu, 2011).

Ali and Faaz (2017) expressed that the learners' study habit delineates their capacity to deal with their time, to design their investigation exercises, their understanding style, their propensity for focus, note making, mental fixation and the judicious utilization of the various techniques for study, for example whole-and-part method, issued and distributed learning.

Over the years, several studies have been made to describe students' study habit using study habit inventories (Wrenn and Humber, 1941; Brown and Holtzman, 1955; Thompson 1976; Houston, 1987; Malik and Parveen, 2013; Goel, 2014; Numan and Hasan, 2017; Rawson et al. 2017). Effective study habits are conditions in which the students study habitually to reach the maximum success of their academic in the school work (Ogbodo, 2010). By this premise, religious practice of study habit demands patience and perseverance because it is not something other people can do for others, rather it is something one must do for himself. Good study habits can lead to good academic record and bad study-habits can lead to poor academic record as there is direct relationship between study habits and academic achievement (Numan and Hasan, 2017; Priya and Dkhar, 2015).

Study habits of the secondary and higher secondary school students and analyzed that the students for secondary school have more favorable study habits than higher secondary school students (Kale, 2011). Singh, Muktesh and Snehalata (2010) studied the study habits in relation to academic performance in high school students and the results indicated that the girls have better study habits than boys. This is in congruence to the result of the study conducted by Ali and Faaz (2017) which presented that females manifested a degree of study habits compared to that of their male counterparts.

In sustaining academic preparation, a culture of achievement needs to be instilled and an academic rigor has to be developed by the learners (Martinez and Klopott, 2005). This academic rigor, accounting for various aspects of an academic program, has to associate with the quality of instruction, curricular improvement and globalization, and introduction to instructional content and practices that the students will encounter at the collegiate level (Barton and Coley, 2009).

Time management can be regarded as a manner of observing and regulating time to effectively increase performance (Mukhtar et al., 2016). It is recognized to be of significant effect towards progressive accomplishment. Along this line, Hart (2012) asserted that time management, satisfaction, sense of belonging, motivation, peer and family support are few of the factors associated with student persistence in any program that brings the nuance of density beyond mere success.

Previous researches showed that academic endeavors and social natures are both imperative in defining choices, processes, and behaviors (Harackiewicz and Sansone, 1991; Pintrich, 2000; Leary, 2011; Rudolph et al., 2011). For instance, Ben-Eliyahu and Bernacki (2015) emphatically attested that social connections and non-scholarly circumstances impact one's ability to connect scholastically; any learning task wherein a student self-directs happens inside a study hall or school setting that exists in an area, inside a nation's arrangements, and at a

specific time; and, in applying an environmental resources point of view at the broadest level, a nation's contemporary culture and strategies impact chances to learn.

Mathematics Anxiety

Anxiety is defined as the feeling of uneasiness and worry, usually generalized and unfocused as an overreaction to a situation that is only subjectively seen as menacing (Malanchini et al., 2017). It is the state of being afraid and irritated with a dangerous fact (Yiğit, 2007, as cited by Tezer & Bozkurt, 2015) and a state of emotion fortified by qualities of fear and dread that impedes learning (Kiss and Vukovic, 2017). Monge et al. (2017) congruously describe it as an affective behavior characterized by the lack of security and relaxation depicted with tension, nerves, concern, worry, irritability, impatience, confusion, fear and mental block.

Mathematics anxiety on the other hand, refers to the avoidance and hesitation in dealing with the subject, and anxiety feelings, fear, nervousness and associated physical symptoms that arise from do math (García-Santillán et al., 2015). According to Puteh and Khalin (2016), it is a feeling of stressed and anxious when faced with numbers and mathematical problem solving in everyday life or when learning mathematics. Gough (1954, as cited by Suárez-Pellicion et al., 2016) coined the term mathemaphobia which refers to the fear and anxiety towards the subject despite the efficiency in other field.

Almost 60% of the school-age students suffer math anxiety (Dowker et al., 2016), which includes sentiments of stress or dread that meddle with the capacity to work with numbers and take care of arithmetic issues both in true circumstances and in the study hall, physiological excitement, nosy contemplation, and escape as well as shirking practices (Kiss and Vukovic, 2017). Mathematics anxiety which has become a significant issue for certain academicians would mean an aimless condition of understudies where they feel apprehensive while concentrating on arithmetic that influences their presentation contrarily and keep them from learning (Puteh and Khalin, 2016) and a negative factor that results in making learning undesirable and decreases favorable connection of the students with the subject (Foley et al., 2017). This is generally a feeling of tension or fear that interferes with mathematics performance (Ashcraft, 2002).

Mathematics Achievement

Education plays a significant role in the pursuit of developing the nation's future manpower for rapid progress (Emmanuel et al., 2014). This paves the way into numerous painstaking quests throughout the world towards discovering more efficient means of enhancing academic standards (Sikhwari, 2014; Mensah et al., 2013). Tezer and Bozkurt (2015) remarked that the most effective and active tool that every individual should learn for organizing a developed community is through the necessary skills and abilities in mathematics. And in fact, achievement in the field of mathematics is considered a predictor of academic success, future employment, and health status (Simms et al., 2017). This obliged the leading policy and education administrations arrange international evaluation studies and publish the educational reforms of the countries on both national and international stands (Yavuz et al., 2017).

Academic achievement in mathematics is a major concern of educational systems across the world (Siebers, 2015). Students' mathematics achievement is often associated with the future economic power and competitiveness of a country, and hence, the desire to understand and identify factors that may have meaningful and consistent relationships with mathematics achievement has been shared among national policy makers and educators around the world (Kupari and Nissinen, 2013). Consequently, deciding sensible and steady factors corresponding to arithmetic accomplishment and understanding them has been profoundly esteemed by national pioneers, policymakers and instructors around the globe; and it launches to expanding speculation, both as far as time and funds, has been committed to creating powerful mediations to improve numerical accomplishment (Simms et al., 2017). There have been different factors that contribute learners' scientific capacity which included family foundation and financial status (Suhas and Pandya, 2016; Spybrook, 2008), impact of the friends who are around (Kupari, 2006), sex-related differences (Else-Quest, et al., 2010; Guiso et al., 2008), and their personal and habitual attributes (Campbell, 2016).

There were also researches made in trying to determine the senior high school students' academic achievement, more particularly to their performance towards mathematics (Kuku and Alade, 2017; Nuñez et al., 2015; Mensah et al., 2013). Emmanuel et al. (2014) also mentioned that it is very imperative to steer studies relating to the academic endeavor of the senior high school knowing that it is the transitional stage prior to higher tertiary education.

Method

This research utilized quantitative non-experimental design method of research using the descriptive-correlation technique and inferential method. The descriptive method of research through the adapted survey questionnaires was utilized which involves the collection, recording, and interpretation of the data (Hanushek & Woessmann, 2017). The inferential research was applied in the analysis of data which could lead to predictions about the entire set of data (Walpole et al., 2014; Kozak, 2014).

Research Subject and Instrument

This study shall be conducted at the City of Mati, Province of Davao Oriental. The findings hereof will be specific to the context of the Davao Oriental State College of Science and Technology (DOSCST) which offers grade 11 and grade 12. This study administered two (2) sets of instruments for its independent variables, to wit: (1) The Study Behavior Inventory, which is a 46-item questionnaire designed by Leonard Bliss (n.d.), and (2) Mathematics Anxiety Questionnaire, a 24-item questionnaire designed by Muñoz and Mato-Vazquez (2007). Both instruments were constructed using a Likert-format scale. These Instruments underwent validity and reliability tests. These were modified to contextualize the school setting and some of the question items were simplified or translated for the better understanding of the respondents.

Universal sampling was utilized in the selection of the respondents. As per records of the DOSCST's Registrar Office, there are 561 bona fide senior high school students of the College of which 158 are grade 11 and 403 are grade 12. Of the 403 grade 12 students, 150 are enrolled in TVL, 80 are enrolled in ABM, 90 are in STEM, and 83 are in HUMSS. Consequently,

universal sampling was used and all 403 grade 12 students of DOSCST were considered as the subjects of this study.

Ethical Consideration

The researchers followed an ethical guideline. This included undertaking appropriate consent before engaging or administering questionnaires to the participants so as to ensure that procedures are fair and unbiased to all respondents. Utmost confidentiality was considered which included the anonymity, responses, and other pertinent information of the respondents.

Findings

Table 1 shows that at 5% level of significance, there is no significant difference among students' study habits when grouped according to their specialization: Accountancy, Business and Management (ABM) Strand; Humanities and Social Sciences (HUMSS) Strand; Science, Technology, Engineering and Mathematics (STEM) Strand; and, Technical-Vocational-Livelihood (TVL) Strand. This connotes that the students had comparable level of study habits regardless of their specialization. It can also be observed that students from different specialization have the same level of study habits as shown to be high. It was remarked by Balamurugan (2013) and Cottrell (2013) that time management plays a very vital role in producing an efficient schedule and planning study time table. Moreover, having high level of study habits is expected to the senior high school students considering that they are preparing themselves to the collegiate challenges.

Table 1.
Difference of senior high school students' study habits according to their field of specialization

Specialization	Mean	SD	Description	F	Sig.
ABM	3.84	.33	High	.34	.799
HUMSS	3.85	.38	High		
STEM	3.93	.23	High		
TVL	3.82	.45	High		
Legend:	4.20-5.00	Very High			
	3.40-4.19	High			
	2.60-3.39	Moderate			
	1.80- 2.59	Low			
	1.00-1.79	Very Low			

Presented on table 2 are the mean differences for the level of mathematics anxiety among senior high school students. Senior high school students who were enrolled in HUMSS Strand and TVL Strand were moderately anxious towards Mathematics, while those enrolled in ABM Strand and STEM Strand had a low anxiety on the same subject. The differences of their means, however, were not statistically significant. The result showed that the students' anxiety towards Mathematics did not significantly differ with respect to the specialization since the significant (p-value) is greater than the alpha level ($p=.684$). Albeit anxiety towards mathematics is affected by the students' perspective (Siebers, 2015), students from ABM and STEM are actually expected

to have low level anxiety with this subject since they are gearing unto the field of engineering and accountancy, wherein they would be bombarded with various mathematics-related field, while the other strands were trained for social sciences and livelihood.

Table 2.
Difference of senior high school students' mathematics anxiety according to their field of specialization

Specialization	Mean	SD	Description	F	Sig.
ABM	2.36	.74	Low	.50	.684
HUMSS	2.64	.62	Moderate		
STEM	2.50	.63	Low		
TVL	2.99	.53	Moderate		
Legend:	4.20-5.00	Very High			
	3.40-4.19	High			
	2.60-3.39	Moderate			
	1.80- 2.59	Low			
	1.00-1.79	Very Low			

Displayed on Table 3 are the results for the correlation on the senior high school students' study habits and mathematics anxiety to their mathematics achievement using the Pearson product-moment correlation. This showed that there was a significant relationship on the students' study habits and mathematics anxiety to their achievement in mathematics. This further implies that the students' study habit was moderately and positively correlated ($r=.302, p=.033$) with their mathematics achievement. Moreover, their mathematics anxiety was strongly and negatively associated ($r= -.904, p=.000$) with their mathematics achievement. Thus, for every increase on the level of their study habits, their mathematics achievement moderately increases as well; and the increase of their mathematics anxiety would tend to the strong decrease of their mathematics achievement.

Table 3.
Correlation of senior high school students' Study Habits and Mathematics Anxiety to their Mathematics Achievement (Pearson Correlation)

	Mathematics Achievement	
Study Habits	<i>r</i>	.302*
	<i>Sig.</i>	.033
Mathematics Anxiety	<i>r</i>	-.904**
	<i>Sig.</i>	.000

Exhibited in table 4 are the regression coefficients of the senior high school students' study habits and mathematics anxiety which had, generally, statistically significant effect on students' mathematics achievement. The model shows that the computed F-value of 30.744 with corresponding P-value of 0.000 lower than the 0.05 level of significance.

Table 4.

Linear Regression Analysis of the Influence of the senior high school students' Study Habits and Mathematics Anxiety to their Mathematics Achievement

Term	Coef	SE Coef	T-Value	P-Value
Constant	89.29	2.489	37.362	.000
Study Habits	.778	.357	2.181	.035
Mathematics Anxiety	-1.861	.401	-4.646	.000
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				
R	.935			
R ²	.874			
F-value	29.474			
P-value	.000			

For further analysis, the data revealed that the R² value of 0.874 signifies that 87.4% of the students had their mathematics achievement influenced considerably by their study habits and anxiety towards the subject. And the difference 12.6% was influenced by other factors that are not covered in this study. The outcomes also showed that the regression equation would be: $MA = 89.29 + .778(SH) - 1.869(MAnx)$, where the response variable is Mathematics Achievement (MA) and the predictors are Study Habits (SH) and Mathematics Anxiety (MAnx). This model revealed that for every unit increase in the study habits, their mathematics achievement would tend to increase by .778. Similarly, for every unit increase in their math anxiety, there would be a decrease of 1.869 units in their math achievement.

This result is in corroboration to the previous findings of the previous studies of Numan and Hasan (2017) who highlighted that study habits had a very significant effect towards mathematics achievement of the students. Their study indicated that students who had effective study habits perform better than those who have ineffective study habits, and that the latter tend to have more mathematics anxiety compared to the first. Moreover, this is in consonance to the investigation of Crede and Kuncel (2008) whose findings revealed that study habit measures improve prediction of academic performance more than any other non-cognitive individual difference variable examined and predicts academic success.

Conclusion

In conclusion, this investigation has contributed to the extant body of understanding and substantiation to the relationship that exists among study habits, mathematics anxiety and mathematics achievement among senior high school students. And based from the salient findings of this study, it is concluded that field of specialization (strand) does not have statistical

bearing on the differences of the students' level of study habits and mathematics anxiety. Therefore, students have to strengthen their study habits and find ways to lessen their mathematics anxiety for them to attain better achievement in mathematics.

Recommendations

From the analysis and findings of this study, since study habit was found to be significantly correlated with mathematics achievement, then schools should design activities or provide areas within the vicinity which could foster study habits. Furthermore, classroom activities gearing towards promoting positive behavior on mathematics should be developed in order to boost the students' perspective in mathematics. Lastly, future studies could be made investigating the root causes of the anxiety of the students towards mathematics and how would this affect not just their mathematics achievement but also their overall academic performance.

References

- Ali, M. I., & Faaz, M. (2017). Study Habits as a Measure of Academic Achievement of Senior Secondary School Students in Relation to Type of School and Gender. *International Education and Research Journal*, 3(6).
- Ashcraft, M. H. (2002). Math anxiety: Personal, educational, and cognitive consequences. *Current directions in psychological science*, 11(5), 181-185.
- Balamurugan, M. *i-Manager's Journal on School Educational Technology*; Nagercoil 8.4 (Mar-May 2013): 22-28.
- Barton, P. E., & Coley, R. J. (2009). Parsing the achievement gap II. Princeton, NJ: Educational Testing Service. Retrieved from <http://files.eric.ed.gov/fulltext/ED505163.pdf>
- Ben-Eliyahu, A., & Bernacki, M. L. (2015). Addressing complexities in self-regulated learning: a focus on contextual factors, contingencies, and dynamic relations. *Metacognition and Learning*, 10(1), 1-13.
- Bliss, L. B. (2003). *The Study Behavior Inventory. Proving and Improving*, 103.
- Brown, W. F., & Holtzman, W. H. (1955). A study-attitudes questionnaire for predicting academic success. *Journal of Educational Psychology*, 46(2), 75.
- Campbell, M. (2016). An Investigation of Academic Preparation 5 Students' and Instructors' Preference of ESL Writing Feedback.
- Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425-453.
- Dowker, A., Sarkar, A., & Looi, C. Y. (2016). Mathematics anxiety: what have we learned in 60 years?. *Frontiers in psychology*, 7.
- Else-Quest, N. M., Hyde, J. S., & Linn, M. C. (2010). Cross-national patterns of gender differences in mathematics: a meta-analysis. *Psychological bulletin*, 136(1), 103.
- Emmanuel, A. O., Adom, A. E., & Solomon, F. K. (2014). Perceived stress and academic performance of senior high school students in Western region, Ghana.
- Emmanuel, A. O., Adom, E. A., Josephine, B., & Solomon, F. K. (2014). Achievement motivation, academic self-concept and academic achievement among high school students. *European Journal of Research and Reflection in Educational Sciences Vol*, 2(2).
- Foley, A. E., Herts, J. B., Borgonovi, F., Guerriero, S., Levine, S. C., & Beilock, S. L. (2017). The Math Anxiety-Performance Link: A Global Phenomenon. *Current Directions in Psychological Science*, 26(1), 52-58.
- García-Santillán, A., del Socorro Flóres-Serrano, M., López-Morales, J. S., & Rios-Alvarez, L. (2014). Factors Associated that Explain Anxiety toward Mathematics on Undergraduate Students.(An

- Empirical Study in Tierra Blanca Veracruz-México). *Mediterranean Journal of Social Sciences*, 5(15), 483.
- Goel, U. (2014). Comparative study of study habits in relation to academic achievement of senior secondary school students. *GYANODAYA-The Journal of Progressive Education*, 7(2), 18-25.
- Hanushek, E. A., & Woessmann, L. (2017). School resources and student achievement: a review of cross-country economic research. In *Cognitive Abilities and Educational Outcomes* (pp. 149-171). Springer International Publishing.
- Harackiewicz, J. M., & Sansone, C. (1991). Goals and intrinsic motivation: You can get there from here. *Advances in motivation and achievement*, 7, 21-49.
- Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, 11(1).
- Houston, L. N. (1987). The predictive validity of a study habits inventory for first semester undergraduates. *Educational and Psychological measurement*, 47(4), 1025-1030.
- James, A. O., Borisade, F. T., Ademuyiwa, A. C., & Bolanle, A. O. (2013). Effects of Gender, Mathematics Anxiety and Achievement Motivation on College Students' Achievement in Mathematics. *International Journal of Education & Literacy Studies*, 1(1), 15.
- Kale, N. V. (2011). Study habits of the secondary and higher secondary school students. *Edu track*, 10(5), 37-38.
- Karakiş, Ö. (2013). University Preparatory Class Students' Study Skills. *Procedia-Social and Behavioral Sciences*, 106, 3195-3209.
- Kiss, A. J., & Vukovic, R. (2017). Math Anxiety and Attitudes Toward Mathematics: Implications for Students with Mathematics Learning Disabilities. *Perspectives on Language and Literacy*, 43(1), 35.
- Kozak, K. (2014). *Statistics Using Technology*. Lulu Press. ISBN 1312185198, 978-1-312-18519-7.
- Kuku, O. O., & Alade, O. M. (2017). Impact of frequency of testing on study habit and achievement in mathematics among secondary school students in Ogun State, Nigeria. *Journal of Educational Research and Practice*, 7(1), 1.
- Kupari, P., & Nissinen, K. (2013). Background factors behind mathematics achievement in Finnish education context: Explanatory models based on TIMSS 1999 and TIMSS 2011 data. In *IEA CONFERENCE 2013, Proceedings*.
- Leary, M. R., & GUADAGNO, J. (2011). Most discussions of self-regulation have focused on the generic psychological processes that allow people to control their thoughts, emotions, and behaviors—processes that are nonspecific with regard to the action being regulated (Baumeister, Heatherton, & Tice, 1994; Carver & Scheier, 1981; Mischel, 1996). For example, TOTE (test-operate–test-exit) and other cybernetic models of self-control (Carver & Scheier, 1981) can be applied to many domains, and the same basic processes are involved regardless *Handbook of self-regulation: Research, theory, and applications*, 339.
- Malanchini, M., Rimfeld, K., Shakeshaft, N. G., Rodic, M., Schofield, K., Selzam, S., ... & Kovas, Y. (2017). The genetic and environmental aetiology of spatial, mathematics and general anxiety. *Scientific Reports*, 7.
- Malik, M., & Parveen, N. (2013). Development of an Indigenous Study Habits and Attitude Inventory for the Adolescent Students. *Pakistan Journal of Social & Clinical Psychology*, 11(1).
- Martinez, M., & Klopott, S. (2005). *The link between high school reform and college access and success for low-income and minority youth*. Washington, DC: American Youth Policy Forum.
- Mendezabal, M. J. N. (2013). Study Habits and Attitudes: The Road to Academic Success. *Open Science Repository Education, Online(open-access)*, e70081928. doi:10.7392/Education.70081928
- Mensah, J. K., Okyere, M., & Kuranchie, A. (2013). Student attitude towards mathematics and performance: Does the teacher attitude matter. *Journal of Education and Practice*, 4(3), 132-139.
- Monge, I. C. D., González, J. E., & Fonseca, J. (2017). Mathematics Anxiety in College Students in Costa Rica and their Relationship with Academic Achievement and Socio-Demographic Variables. *Ene*, 5(1), 275-324.

- Moyana, H. J. (1996). Factors related to mathematics achievement of secondary school pupils (Doctoral dissertation).
- Mukhtar, U., Ramzan, S., & Fatima, K. (2016). Analysis of Employees' Time Management Behavior Skills and Strategies (TMBSS) in Pakistan. *STRATEGIC MANAGEMENT*, 21(4), 12-21.
- Muñoz-Cantero, JM, & Mato-Vázquez, D. (2007). Elaboration and factorial structure of a questionnaire to measure "anxiety towards mathematics" in compulsory secondary education students.
- Numan, A., & Hasan, S. S. (2017). Effect of Study Habits on Test Anxiety and Academic Achievement of Undergraduate Students. *Journal of Research & Reflections in Education (JRRE)*, 11(1).
- Núñez, J. C., Suárez, N., Rosário, P., Vallejo, G., Valle, A., & Epstein, J. L. (2015). Relationships between perceived parental involvement in homework, student homework behaviors, and academic achievement: differences among elementary, junior high, and high school students. *Metacognition and learning*, 10(3), 375-406.
- Ogbodo, Rosemary Ochanya PhD, "Effective Study Habits in Educational Sector: Counseling Implications", *Edo Journal of Counseling*, Vol. 3, No. 2, 2010, Pp. 229
- Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. *Handbook of self-regulation*, 451, 451-502.
- Priya, M., & Dkhar, C. D. (2015). Study habits and attitudes of school children. *Indian Journal of Health and Wellbeing*, 6(6), 553.
- Puteh, M., & Khalin, S. Z. (2016). Mathematics anxiety and its relationship with the achievement of secondary students in Malaysia. *International Journal of Social Science and Humanity*, 6(2), 119.
- Rawson, K., Stahovich, T. F., & Mayer, R. E. (2017). Homework and achievement: Using smartpen technology to find the connection. *Journal of Educational Psychology*, 109(2), 208.
- Rudolph, K. D., Abaied, J. L., Flynn, M., Sugimura, N., & Agoston, A. M. (2011). Developing relationships, being cool, and not looking like a loser: Social goal orientation predicts children's responses to peer aggression. *Child development*, 82(5), 1518-1530.
- Siebers, W. M. (2015). The relationship between math anxiety and student achievement of middle school students (Doctoral dissertation, Colorado State University. Libraries).
- Sikhwari T.D (2014): A study of the Relationship between Motivation Self-Concept and Academic Achievement of Students at a University of Limpopo Province, South Africa. *International Journal of Educational Science* 6(1) 19-25
- Simms, V., Gilmore, C., Sloan, S., & McKeaveney, C. (2017). Interventions to improve mathematics achievement in primary school-aged children: a systematic review.
- Simms, V., Gilmore, C., Sloan, S., & McKeaveney, C. (2017). Interventions to improve mathematics achievement in primary school-aged children: a systematic review.
- Singh, S., Muktesh, S., & Snehalaria, C. (2010). Study habits in relation to academic performance in high school students. *Asian Journal of Development Matters*, 4(2), 209-215.
- Spybrook, J. (2008). The relationship among working memory, mathematics anxiety, and mathematics achievement in developmental mathematics courses in community college. University of San Francisco.
- Suárez-Pellicioni, M., Núñez-Peña, M. I., & Colomé, À. (2016). Math anxiety: a review of its cognitive consequences, psychophysiological correlates, and brain bases. *Cognitive, Affective, & Behavioral Neuroscience*, 16(1), 3-22.
- Suhas, P. S., & Pandya, S. (2016). Factors Influencing Students' Academic Performance in Mathematics. *Educational Quest*, 7(3), 291.
- Tezer, M., & Bozkurt, A. S. (2015). Determining Attitudes and Anxiety Levels of Students in Need of Protection Towards Mathematics Course. *Procedia-Social and Behavioral Sciences*, 186, 269-273.
- Thompson, M. E. (1976). A new study habits inventory: Description and utilization. *Reading Horizons: A Journal of Literacy and Language Arts*, 16(3), 2.
- Walpole, R. E., Keying, E., Myers, R. H., & Myers, S. L. (2014). *Probability and Statistics for Engineers and Scientists*, 5th Edition. Pearson. 978-9-332-51908-4.

- Wrenn, C. G., & Humber, W. J. (1941). Study habits associated with high and low scholarship. *Journal of Educational Psychology*, 32(8), 611.
- Yavuz, H. Ç., Demirtasli, R. N., Yalçin, S., & Dibek, M. I. (2017). The Effects of Student and Teacher Level Variables on TIMSS 2007 and 2011 Mathematics Achievement of Turkish Students. *Egitim ve Bilim*, 42(189).