WWJMRD 2020; 6(9): 28-32
www.wwjmrd.com
International Journal
Peer Reviewed Journal
Refereed Journal
Indexed Journal
Impact Factor MJIF: 4.25
E-ISSN: 2454-6615

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Students' Attitude, Self-Efficacy and Motivation towards Mathematics Performance

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Abstract
Mathematics has often been characterized as the most precise of all sciences. It empowers human to understand better of the evidence –laden world in which they lived. Likewise, it provides human beings the pattern to analyze and solve the predicament existed in society. It is essential to our world, so its knowledge is transferable to many situations. The knowledge acquired contains great problem solving and logical thinking skills. Living can be a mystery, but mathematics provides amazing solutions to all problems. This study was conducted to find out whether the students' attitude, self-efficacy and motivation have an impact to their performance. It aims to answer the relationship between the students' academic performance and their attitude, self-efficacy and motivation towards the subject. This is anchored on Piaget's (1968) Developmental Constructivism Theory. A descriptive-survey method with the aid of questionnaire composed of forty-five (45) questions as gathering tool, used to the two hundred twenty (220) respondents inquiring the perception to determine the assessment of the students' attitude, self-efficacy, and motivation towards mathematics. The researchers achieved the following findings: learning mathematics depends upon the students' attitude, self-efficacy and motivation. Thus, the higher the positive attitude, the higher degree of self-efficacy and the higher level of motivation in mathematics result to a higher academic performance. It is recommended that there should be a close monitoring, intervention plan between administrators, teachers, parents, stakeholders and learners to sustain a very satisfactory performance.

Keywords: Academic Performance, Attitude, Mathematics, Motivation, Self-Efficacy.

Introduction
Mathematics is hardwired to every facets of daily life. The artifice can be used to solve problems related to time, sports, travel, management, science to name a few. It is part of the history, they help to connect, create, communicate reason and solve. Using mathematical thinking allows us to analyze novel and complex problems from a variety of perspectives, consider possible solutions and evaluate the effectiveness of solutions. When developed early in life, these habits of mind engender generate confidence in our ability to solve everyday problems without doubt or fear of math.

Research shows that students liked mathematics because they saw its value in everyday life, and they found it interesting and enjoyable. They possessed self-confidence to do well in it which is in line with Van der Bergh (2013) who found a significant influence between self-confidence and students' ability to successfully learn and perform well in mathematics. The study of Syyeda (2016) also supports this finding as it was found that despite negative emotions, students' valued mathematics in future and in their present lives. Every now and then, people applied mathematics in decision making, achieving goals and coping problems in life. It is then, that mathematics is essential in all aspects.

The study of Patena and Dinglasan (2013) aimed to determine the performance of the students in the area of Mathematics particularly in Algebra and Trigonometry. The results revealed that the students who took the subjects for the two academic years were not able to meet the required criteria.

According to research, it is alarming that Filipinos are found lacking in the ability of basic mathematical knowledge. In this connection, this is the main reason why the researcher is

very interested to make a study so that if not solve at least it helps the mathematics teacher improve their learners' academic performance.

Literature Review

Mathematics is one of the core subjects to all students in primary, elementary, and secondary schools. It is always a subject for improvement in these times and the daily application.

This subject has tremendous scope; however, its many separate disciplines can differ greatly in terms of subject matter. No single path to discovery exists in Mathematics and not even one clear-cut description can be given that accounts for all the ways in which Mathematics is pursued. It plays a salient role in shaping the logical thinking of one's student life

It serves as the vehicle towards achieving goals. It is a subject to be embraced to pay attention and to give importance of. Some students felt burden, some felt challenge and others felt Mathematics subject enjoyable. It is a very interesting subject that is needed in all walks of life. However, to many, it is a difficult and seemingly dry subject to learn.

The Walberg's Theory is relevant to guide this study regarding factors affecting students (a like or dislike) towards mathematics and those affecting their learning and performance. Factors that guide the study include: students' motivation, and prior achievement; quality and quantity of instruction; home, school and peer environment; and mass media specifically availability of computer. (Bruinsma & Jansen, 2007). The theory states that, every learner has different views in Mathematics. There are different factors mentioned to be considered. The mathematical foundation they learned plays an important role in learning the subject matter.

Learning mathematics depends upon the learners' attitude, self -efficacy and motivation towards the subject. It determines the ability, skills, eagerness to learn, open-mindedness and able to face and to response challenges.

Objectives

The purpose of this study is to determine the relationship between the attitude, self-efficacy, and motivation towards Mathematics and the academic performance of the students.

Specifically, it aims to answer the following questions:

1. What is the profile of the student- respondents in terms of:

1.1 age; and
1.2 sex?

2. What is the profile of the teacher- respondents in terms of:

2.1 age; and
2.2 sex?

3. What is the assessment of the respondents on the students' attitude, self-efficacy and motivation towards Mathematics?
4. Is there a significant relationship between the students' academic performance and their:
    7.1 attitudes;
    7.2 self-efficacy; and
    7.3 motivations towards Mathematics?

Methodology

A descriptive-survey method with the aid of questionnaire as gathering tool. The researcher collects the data through forty -five (45) questions inquiring the respondents to determine the assessments on the students' attitude, self-efficacy, and motivation towards mathematics. Through this process, the collected data and information existed.

This study focused on the Secondary Schools in the District of Candijay namely Anoling NHS, Candijay NHS, Cogtong NHS La-Union NHS and Tambongan NHS respectively. There were twenty (20) teachers and two hundred (200) students for a total of 220 respondents participated in the study. The teacher- respondents randomly selected 10 students per grade level.

Profile of the respondents in terms of age and sex was determined using survey questionnaires. Questionnaires were distributed personally to the respondents and explained to them thoroughly the importance of the study and assisted in answering the questionnaires to clarify the difficult words or questions to the respondents. The said respondents were given ample time to answer the questions. It was then retrieved the answered questionnaires.

For statistical purposes, the answers on the assessment of the respondents on

the students' attitude, self-efficacy and motivation towards mathematics, were categorized as Strongly Agree, Agree, Disagree and Strongly Disagree, with weight equivalents of 4,3,2,1respectively from which the weight means were derived. To further test the significant result, Pearson formula was used.

Results and Discussion

This study was conducted among the secondary students in Candijay District. The findings are herein presented and analyzed in light of the various aspects of the research problem.

Table 1: Profile of Student-Respondents
N=200

1.1 Age	**F**	**%**	**Rank**
13 – 15	162	81.00	1
16 – 18	35	17.50	2
19 – 21	3	1.50	3
22 yrs and above	0	0	4
Total	**200**	**100%**	
1.2 Sex			
Male	65	32.50	2
Female	135	67.50	1
Total	**200**	**100%**	

Table 1 illustrates the profile of the student – respondents include their age, and sex. As to age, it illustrates that ages thirteen to fifteen (13 – 15) ranked the highest with a frequency of one – hundred sixty-two (162) or 81.00% of the total sample size. In contrast, the lowest frequency goes to ages 22 and above with a frequency of zero. Next in rank is ages sixteen to eighteen (16-18) with a frequency of thirty-five (35) or 17.50% of the total sample size. It follows ages nineteen to twenty-one (19-21) with a frequency of three (3) or 1.50%. Generally, students begin elementary school at 6 years of age and graduate at 13. Secondary schools, often called high schools, provide instructions from grades 7-12. Generally, students begin high school at 14 years of age and graduate at 18.

Sex. Most of the respondents were female with a frequency of one hundred thirty-five (135) or 67.50% and there were only sixty-five (65) male students or 32.50% of the sample size. These findings proved that the student population of the public secondary schools in Candijay District has been consistently dominated by female students since then.

Table 2: Profile of Teacher-Respondents
N=20

2.1 Age	F	(%)	Rank
20 – 29 years old	6	30.00	2
30 – 39 years old	7	35.00	1
40 – 49 years old	2	10.00	4
50 years old and above	5	25.00	3
Total	**20**	**100%**	
2.2 Sex			
Male	6	30.00	2
Female	14	70.00	1
Total	**20**	**100%**	

Table 2 displays the profile of the teacher -respondents. It includes their age, and sex.

As to age, majority of the teacher -respondents have the age of ranging from thirty to thirty-nine (30-39) years old with the frequency of seven (7) or 35.00% On the other hand, the lowest frequency is ages forty to forty-nine (40-49) with a frequency of two (2) or 10.00%. It implies that majority of the respondents are matured enough and have enough knowledge to lead and teach such group of individuals.

However; as to sex, it shows that most of the respondents were female with 70% of the population equivalent to fourteen (14) respondents and only six (6) out of twenty (20) respondents were males with a percentage of 30.00%. Women dominated the teaching profession. It signifies that women are more likely to be in the teaching field than men.

Table 3: Respondents' Assessment on the Students' Attitude towards Mathematics
N_1=200, N_2= 20

Statements	**Student**			**Teacher**			**Overall**		
I / My students…….	WM	DI	Rank	WM	DI	Rank	WM	DI	Rank
1. have a lot of self-confidence when it comes to Mathematics.	2.86	A	7	3.20	A	4.5	3.03	A	6.5
2. believe that mathematics can develop the mind and teaches a person to think.	3.55	SA	1	3.35	SA	2	3.45	SA	2
3. can solve mathematics problems without too much difficulty.	2.75	A	13.5	3.05	A	12.5	2.90	A	13.5
4. prefer to solve problems in math than to write an essay.	2.75	A	13.5	3.05	A	12.5	2.94	A	13.5
5. get a great deal of satisfaction out of solving mathematics problem.	2.84	A	9	3.05	A	12.5	2.94	A	12
6. want to develop mathematical abilities.	3.18	A	5	3.00	A	15	3.09	A	5
7. can resolve mathematics problems without too much struggle.	2.62	A	15	3.15	A	8	2.88	A	15
8. believe that mathematics is important in everyday life.	3.41	SA	2	3.65	SA	1	3.53	SA	1
9. can do advanced work in Math	2.91	A	6	3.15	A	8	3.03	A	6.5
10. believe that mathematics is a very interesting and enjoyable subject.	3.40	SA	3	3.30	SA	3	3.35	SA	3
11. have confident to learn advanced mathematics.	2.80	A	11.5	3.15	A	8	3.02	A	8
12. feel comfortable in answering questions in math class	2.85	A	8	3.15	A	8	3.00	A	10
13. have courage to study more in Math.	3.20	A	4	3.05	A	12.5	3.13	A	4
14. can think of good things and do suitable ways when it comes to mathematics.	2.83	A	10	3.20	A	4.5	3.01	A	9
15. make busy solving mathematical problems and accomplishing it well.	2.80	A	11	3.15	A	8	2.97	A	11
Average Weighted Mean (AWM)	2.99	Agree		3.17	Agree		3.08	Agree	

Legend:
1.00– 1.74 - Strongly Disagree (SD)
1.75 – 2.49 - Disagree (D)
2.50 – 3.24 - Agree (A)
3.25 – 4.00 - Strongly Agree (SA)

The result showed that learning Math depends upon the learners' attitude towards the subject. It determines the ability, skills, eagerness to learn, open mindedness and able to face and response challenges. They like mathematics because they saw its value in everyday life. It can develop their thinking skills.

Table 4: Respondents' Assessment on the Students' Self-Efficacy towards Mathematics
N_1=200, N_2= 20

Self-Efficacy	**Student**			**Teacher**			**Overall**		
I / My students…….	WM	DI	Rank	WM	DI	Rank	WM	DI	Rank
1. believe to learn in the subject.	3.06	A	2.5	2.95	A	15	3.01	A	12
2. can accomplish the difficult tasks assigned	2.85	A	13	3.25	SA	7.5	3.05	A	10
3. can obtain outcomes that are important	3.06	A	2.5	3.30	SA	3.5	3.18	A	4
4. can succeed at almost endeavor	2.87	A	9.5	3.20	A	10	3.03	A	11
5. can overcome many challenges successfully	3.04	A	4	3.25	SA	7.5	3.14	A	6
6. can perform different tasks effectively	2.87	A	9.5	3.25	SA	7.5	3.06	A	9
7. can fulfill the job assigned independently	2.71	A	15	3.05	A	12	2.88	A	15
8. can perform quite well even when things are tough	2.86	A	11.5	3.15	A	11	3.00	A	13
9. can think of good things and do suitable ways even when difficult situations happen	2.91	A	6	3.15	A	8	3.03	A	6.5

10. can figure out how to do the most difficult work	2.83	A	14	3.00	A	13.5	2.91	A	14
11. have enough confident to face any challenges in life.	3.01	A	5	3.40	SA	2.5	3.20	A	2.5
12. can do most tasks very well compared to others	2.86	A	11.5	3.30	SA	3.5	3.08	A	8
13. can handle different situations in a positive way	2.95	A	8	3.45	SA	1	3.20	A	2.5
14. believe to do the best things assigned	2.99	A	6	3.00	SA	13.5	3.15	A	5
15. make busy doing things and accomplishing it well	2.98	A	7	3.25	A	7.5	3.11	A	7
Average Weighted Mean (AWM)	2.94	Agree		3.23	Agree		3.08	Agree	

Legend:
1.00– 1.74 - Strongly Disagree (SD)
1.75 – 2.49 - Disagree (D)
2.50 – 3.24 - Agree (A)
3.25 – 4.00 - Strongly Agree (SA)

This table reveals that having a high self-efficacy is actually a good predictor of academic success. It helps innovators to navigate through complex problems and overcome setbacks that typically occur. The more you successfully perform a task the more your sense of self-efficacy strengthens. Completing a task can also help build own self-efficacy and causes to believe in their abilities that much more.

Table 5: Respondents' Assessment on the Students' Motivation towards Mathematics
N_1=200, N_2= 20

Statement	Student			Teacher			Overall		
I / My students…..	WM	DI	Rank	WM	DI	Rank	WM	DI	Rank
1. feel motivated to get better grades than the other students	3.02	A	11	3.10	A	11.5	3.06	A	11
2. get encouraged to spend time studying the lesson	2.89	A	14	3.20	A	8	3.04	A	12.5
3. believe that learning is fun.	3.45	SA	2	3.35	SA	2.5	3.40	SA	1
4. fell felicitous in studying the subject	2.94	A	13	3.30	SA	5	3.12	A	10
5. get inspired to work and study hard	3.53	SA	1	3.10	A	11.5	3.30	SA	4
6. feel enjoyable studying the lessons	3.04	A	9	3.30	SA	5	3.17	A	7.5
7. want to learn as much as possible in the class	3.38	SA	3	3.20	A	8	3.29	SA	5.5
8. make prepared for the lessons	3.20	A	6	3.15	A	10	3.17	A	7.5
9. exert more effort in solving problems	3.08	A	8	3.00	A	13.5	3.04	A	12.5
10. believe that studying problem solving is helpful in all areas in life	2.99	A	12	3.30	SA	5	3.14	A	9
11. feel inspired to solve problems	3.03	A	10	3.00	A	13.5	3.01	A	14
12. fully motivated to learn more	3.27	SA	5	3.35	SA	2.5	3.31	SA	2.5
13. feel motivated to study harder to improve	3.37	SA	4	3.20	A	8	3.29	SA	5.5
14. completely inspired in mastering the subject because of its importance	3.17	A	7	3.45	SA	1	3.31	SA	2.5
15. get a greater deal of satisfaction out of solving different problems	2.83	A	15	2.80	A	15	2.81	A	15
Average Weighted Mean (AWM)	3.14	Agree		3.15	Agree		3.15	Agree	

Legend:
1.00– 1.74 - Strongly Disagree (SD)
1.75 – 2.49 - Disagree (D)
2.50 – 3.24 - Agree (A)
3.25 – 4.00 - Strongly Agree (SA)

The respondents consistently exhibit the same viewpoint that the positive motivation will leads to a good academic performance. This implies that students' motivation is indicated by belief that they can learn mathematics, feeling of responsibility to undertake mathematical tasks. Motivated learners perform well.

Conclusion

It is concluded that learning Mathematics depends upon the learner's attitude, self-efficacy and the way they motivated towards the subject. Thus, the higher the positive attitude, high degree of self-efficacy and high level of mathematics motivation will result to a higher academic performance. It determines the ability, skills, eagerness to learn, open mindedness and able to face and response challenges.

Recommendation

Based on the conclusions mentioned, it is recommended that there should be a specific school activity regarding mathematics to sustain a very satisfactory performance. Teachers should encourage the students to do problem solving exercises and should apply different techniques and approaches to motivate and improve the attitudes of students towards mathematics. Students should engage with peers in learning activities for group study so that they would feel belongingness and be able to show their abilities and capabilities. This will help them gain self- confidence.

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