

Effect of “Math Hugot” on Attitudes Toward Mathematics among Grade 10 Students of  
Sauyo High School, S.Y. 2020 – 2021

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This research proposal is for approval by the Schools Division Office, Quezon City, Metro Manila.

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## Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words “**here we show**” or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

*Keywords:* “Math Hugot”, attitudes toward Mathematics, high school, grade 10, attitudes, Mathematics

Word count: X

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Low performance in Mathematics is a prevalent problem among high school students in the Philippines. As revealed in the Trends in International Mathematics and Science Study (TIMSS) conducted in 1995, 1999 and 2003, the Philippines was consistently ranked among the five least performing countries (Gunigundo I, 2020). Similarly, the results of the 2018 Programme for International Student Assessment (PISA) Survey showed that among the 79 countries that are members of the Organization for Economic Co-operation and Development (OECD), the Philippines is the second worst performer in Mathematics (Llemit, 2019). These results are also similar to the outcomes of the National Achievement Tests (NAT) (Catap-Lacson, 2019). Since the school year 2013–2014, the national average in the NAT obtained by Grade 10 learners has been continuously decreasing (Aguinaldo, 2019). To demonstrate, the overall mean percentage score (MPS) gained by our junior high school takers was 51.41 in 2013, 53.77 in 2014, 49.48 in 2015, 44.1 in 2016, 44.08 in 2017, and 44.59 in 2018. Unfortunately, these results are all within the “low mastery” level<sup>1</sup> (Aguinaldo, 2019; Albano, 2019). Even the City of San Fernando, which obtained the highest total ranking in the 2018 NAT in Central Luzon with an overall MPS of 47.21 (“City of San Fernando tops national achievement tests anew,” 2019), is still within the “low mastery” range. The Grade 10 overall MPS is also a reflection of the performance of our high school students in Mathematics. In fact, even if the junior high school takers in the City of San Fernando landed on the fourth place in Mathematics with an MPS of 35.12 (“City of San Fernando tops national achievement tests anew,” 2019), their score still falls within the “very low mastery” level. These statistics are all evidence of the serious problem that the Philippines is facing regarding the low performance of high school students in Mathematics .

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<sup>1</sup> The NAT scores are interpreted in the following manner: “very low mastery” refers to MPS of 35 and below; “low mastery”, 36 to 65; “average mastery”, 66 to 85; “moving towards mastery”, 86 to 95; and “mastered”, 96 to 100 (Albano, 2019).

Given the low competence of our high school students in national and international examinations, it is necessary to determine the factors that contribute to more positive achievement outcomes in Mathematics. One such factor is attitude.

### **Attitudes toward Mathematics and their Effects**

Attitude is defined by psychologists as “likes and dislikes – favorable or unfavorable evaluations of and reactions to objects, people, situations, or other aspects of the world, including abstract ideas and social policies” (Nolen-Hoeksema, Fredrickson, Loftus, & Wagenaar, 2009)

Attitudes toward Mathematics have been defined as “a range of beliefs, relevance, affections, and behaviors regarding such matters as a person’s belief about the level of complexity feature of mathematics, the relevance assigned to mathematics for society, feelings of interest concerning mathematics, and the desire or intention to learn more about mathematics” (Buabeng-Andoh, 2019). Mathematics attitude should be viewed as a predisposition to respond in an unfavorable or favorable way to mathematics. (Moeinikia & Zahed, 2010)

Many researchers have discovered that attitudes toward Mathematics (ATM) predict math achievement (Demir-Lira, Suárez-Pellicioni, Binzak, & Booth, 2019; Lipnevich, Preckel, & Krumm, 2016; Peteros, Columna, Etcuban, Porferio Almerino, & Almerino, 2019) although a few have determined that no significant relationship occurs between these two variables (June & Eamoraphan, 2019). In support of the findings by the majority of researchers in this field, Saadati and Reyes (2019) found out that when compared to students with negative attitudes toward mathematics, those who have very positive or moderately positive attitudes achieved higher scores in solving mathematical problems. This is because the differences in the students’ attitudes affect how they select their strategies in problem solving and how they become mindful of assessing their solutions.

Aside from Mathematics performance, attitudes have also been found to correlate with metacognition skill (Orman & Sevgi, 2019) and self-efficacy perceptions towards mathematics (Mumcu & Aktas, 2015). These studies reveal the importance of attitudes in learning Mathematics. In view of this, a deeper investigation of attitudes toward Mathematics and their underlying factors follows.

### **Factors Affecting Attitudes toward Mathematics**

Many researchers have focused on determining the factors that have an impact on attitudes toward Mathematics. Some of these factors, such as gender, Mathematics anxiety, motivation, game preferences, grade level, extreme response style in test-taking, competence, enjoyment, perceived relevance, mathematical thinking, race, and prior mathematics achievement, can be categorized as components that are internal to the learner. The other elements, such as parental influences, teacher affective support, classroom instruction, number type, classroom culture, teaching methods, school type, and risk-taking in class, are classified as factors that are external to the students. Among the internal constituents of attitudes toward Mathematics, gender is one of the most studied.

**Gender.** students have a positive attitude toward mathematics. (Karjanto, 2017; Mata, Monteiro, & Peixoto, 2012) level of attitudes toward mathematics of Grade 10 students was high (June & Eamoraphan, 2019)

males' average attitude score was significantly less than females' average attitude scores (Rechber, Isiksal, & Koç, 2018) female students scoring higher than male students in both constructs (enjoyment of mathematics and mathematical self-perceptions) (Afari & Khine, 2018) Girl students reported more positive mathematics attitudes compared to boys when they experienced higher levels of autonomy in their mathematics classes. (Zuo, Ferris, & LaForce, 2019) Longitudinally, higher mathematical competence in sixth grade was associated with better mathematics attitudes in seventh grade for girls but not for boys. (Geary et al., 2019)

There is no significant difference between male and female students in terms of their attitude toward mathematics (Karjanto, 2017; Orman & Sevgi, 2019; Sarouphim & Chartouny, 2017; Siregar, Wimbari, & Ilham, 2019) No gender effect was identified although the girls showed a continuous decline in attitudes the further they progressed in school. (Mata et al., 2012)

### **Changing Attitudes**

The following interventions were applied in order to improve the students' attitudes toward Mathematics:

### **Limitations of These Studies**

The cited studies did not focus on:

- III

### **The Concept and Phenomenon of “Math Hugot”**

“And while it was initially an expression of sentimentality, sorrow or spite, hugot eventually took on playful undertones as usage became more and more widespread...” (Verayo-De Villa, 2018).

“Math Hugot” is a statement creatively relating a Mathematical concept to human relationships so as to invoke sentimental memories or humor.

#### **Defining Characteristics of a “Math Hugot”**

1. Relates, not applies, a Math concept to human relationships.
2. The relating is done creatively by:
  - a. exploiting the ambiguity of Mathematical terms. Example: "Sana naging 90-degree angle na lang ako. Bakit? Para masabi mong ako na si Mr. Right."
  - b. relating the Math concept to an aspect of human life that is not obviously related to Math, that is, relationships Example: "Ang love story natin ay parang asymptotes, kasi kahit anong lapit ko sa iyo, di pa rin tayo magtatagpo."

- c. applying the figures of speech, usually simile or metaphor Example: "Sana naging center ka na lang at circumference naman ako. Bakit? Para sa iyo umikot ang buhay ko."
- 3. Elicits humor or nostalgic emotions.
- 4. Can be a one-line statement or in the form of a "pick-up line".

This research proposal attempts to determine the effectiveness of “Math Hugot” as an intervention for improving the attitudes toward Mathematics among the Grade 10 students of Sauyo High School. The main questions to be explored are: (1) What is the mean

**Methods**

**Results**

**Discussion**

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## Appendix

## ATTITUDES TOWARD MATHEMATICS INVENTORY

Directions: This inventory consists of statements about your attitude toward mathematics. There are no correct or incorrect responses. Read each item carefully. Please think about how you feel about each item. Darken the circle that most closely corresponds to how the statements best describes your feelings. Use the following response scale to respond to each item.

PLEASE USE THESE RESPONSE CODES:

A – Strongly Disagree
B – Disagree
C – Neutral
D – Agree
E – Strongly Agree

1. Mathematics is a very worthwhile and necessary subject.
2. I want to develop my mathematical skills.
3. I get a great deal of satisfaction out of solving a mathematics problem.
4. Mathematics helps develop the mind and teaches a person to think.
5. Mathematics is important in everyday life.
6. Mathematics is one of the most important subjects for people to study.
7. High school math courses would be very helpful no matter what I decide to study.
8. I can think of many ways that I use math outside of school.
9. Mathematics is one of my most dreaded subjects.
10. My mind goes blank and I am unable to think clearly when working with mathematics.
11. Studying mathematics makes me feel nervous.
12. Mathematics makes me feel uncomfortable.
13. I am always under a terrible strain in a math class.
14. When I hear the word mathematics, I have a feeling of dislike.
15. It makes me nervous to even think about having to do a mathematics problem.
16. Mathematics does not scare me at all.
17. I have a lot of self-confidence when it comes to mathematics
18. I am able to solve mathematics problems without too much difficulty.
19. I expect to do fairly well in any math class I take.
20. I am always confused in my mathematics class.
21. I feel a sense of insecurity when attempting mathematics.
22. I learn mathematics easily.
23. I am confident that I could learn advanced mathematics.
24. I have usually enjoyed studying mathematics in school.
25. Mathematics is dull and boring.
26. I like to solve new problems in mathematics.
27. I would prefer to do an assignment in math than to write an essay.
28. I would like to avoid using mathematics in college.
29. I really like mathematics.
30. I am happier in a math class than in any other class.
31. Mathematics is a very interesting subject.
32. I am willing to take more than the required amount of mathematics.
33. I plan to take as much mathematics as I can during my education.
34. The challenge of math appeals to me.
35. I think studying advanced mathematics is useful.
36. I believe studying math helps me with problem solving in other areas.
37. I am comfortable expressing my own ideas on how to look for solutions to a difficult problem in math.
38. I am comfortable answering questions in math class.
39. A strong math background could help me in my professional life.
40. I believe I am good at solving math problems.

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*Figure A1.* Attitudes Toward Mathematics Inventory, used with permission