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Factors Associated with Muslim High School Students' Mathematics Performance in Three Selected Regions in Mindanao: Basis for Intervention

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Abstract. This study was conducted to find out the factors associated with Muslim High school students' Mathematics performance (SY 2008-2009) in three selected regions (Public National High Schools) in Mindanao. Combined quantitative – qualitative research method was used in this study. Research instruments for qualitative data were: classroom observations, informal and formal interviews, questionnaires for high school Mathematics teachers and students. Mathematical Attitude Inventory for students and Attitude Inventory scale for teachers were used for quantitative data. Results revealed that, ZCNHS Muslim Students' GPAs and their teachers qualifications is significant but indicates weak relationship. CCNHS Muslim students GPAs and their teachers' qualifications are likewise weak and insignificant. MCNHS Muslim students' GPAs and their teachers' qualifications is significant and positive (r=.579). Generally, Mathematics Teachers' Qualifications and Muslim Students GPAs appears to be weak (r=.238) but significant at .000 level. In the case of student's GPAs and their Mathematical Attitude Inventory scores found to have low and insignificant for ZCNHS, CCNHS, and MCNHS respectively. Therefore, Muslim Students' Mathematical Inventory Scale scores and Muslim Students' GPAs in general among the three City public National high schools in Mindanao is very negligible (low) and insignificant (r=.079), at 5% level. However, there are significant differences among the three public national high Schools in Mindanao in terms of physical facilities, buildings, classrooms, library and math books, equipment, class size, population size, number and size of classrooms, audiovisual aids, instructional facilities, computers, size of playground. It can be concluded that cultural orientation and high school context factors probably help explain positive but low math performance among selected respondents such as *maratabat*, fidelity to Islam, motivation to succeed, school and home environment, close kinship, peer influence, as well as availability of instructional facilities.

Keywords: Math performance; attitude inventory; school facilities

Introduction

Mathematics is a way of describing relationships between numbers and other measurable quantities. Mathematics can express simple equations as well as interactions among the smallest particles and the farthest objects in the known universe. Mathematics allows scientists to communicate ideas using universally accepted terminology. It is truly the language of science. Modern societies benefit every day from the results of mathematical research. The fiber-optic network carrying peoples' telephone conversations was designed with the help of mathematics. The ubiquitous computers are the result of millions of hours of mathematical analysis. Weather prediction, the design of fuel-efficient automobiles and airplanes, traffic control, and medical imaging all depend upon mathematical analysis (Pilant, 2005). Given the vital and central role played by mathematics in the modern science-and technology-oriented and controlled world, the Philippines cannot afford to lag behind in the field. Declining mathematics performance understandably generates concern and alarm within society. Unfortunately, as early as the 1970's, there were already reports on the alarmingly poor performance of Filipino pupils in the 3R's (reading, writing, and arithmetic). One such report was the Survey of Outcomes of the Elementary Education (SOUTELE, 1976) which identified an array of factors contributing to the problem, foremost of which had to do with teacher training and methodology, inadequate school facilities, and poor linguistic ability or limited English proficiency of the learners.

The same problems continue to plague the Philippine educational system. Landrito (1991; cited in Ababa, 1998) found that in the Philippines, students generally perform poorly in mathematics in all levels--elementary, secondary, and collegiate level. Accordingly in the collegiate level, in the University of the Philippines in Diliman, in particular, it was found that one out of every three students repeats a mathematics course. The situation must be worse in less developed areas in the country, especially in rural areas remote from urban centers like Metro Manila and Cebu. Declining performance in mathematics understandably generate concern within society. Ibe (1997) likewise reported that in the third International Mathematics and Science Study (TIMSS), which measured the mathematics and science achievement of basic education students in 41 participating countries, the Philippines pathetically landed near the bottom, 39th in mathematics and 40th in science. Although the Philippines did not come last, the overall showing of its representatives in the TIMSS is still abysmal by any standard. It was handwriting on the wall that could not be ignored. In secondary schools, the value of mathematics can hardly be overemphasized. High school mathematics prepares the students for more advanced and complex mathematics at the college level. Since the subject is highly sequential, in

concepts development courses, the importance of foundation courses -- high school mathematics -- is undeniable. Even if the student fails to continue his studies in college, he/she still needs mathematics in his daily life in the performance of his duties as a citizen as a useful vocation, and in dealing with his physical and social environment. Secondary education must equip learners with functional mathematics ability. This study aimed to determine the factors associated with Muslim high school students' mathematics performance in three Public National High Schools in Mindanao, namely: Marawi City National High School (MCNHS), Cotabato City National High School (CCNHS), and Zamboanga City National High School (ZCNHS). Specifically, it sought to answer the following questions: (1) What is the descriptive profile of mathematics teachers and Muslim students across the three regions (ARMM, Region 9, and Region 12) covered in this inquiry? (2) What is the description of school and home environments across the three regions? (3)What are the attitudes of mathematics teachers towards mathematics? (4) What are the attitudes of Muslim students towards mathematics? (5) What are the problems encountered by mathematics teachers in teaching mathematics and how do they cope with these? (6) What cultural orientations and practices are manifested by the students in mathematics classes across the three regions in Mindanao? (7) What intervention program can be proposed to improve the teaching of mathematics in Mindanao National High Schools?

Theoretical Framework

Learning continues throughout individuals' lives and affects almost everything they do. It is a lifetime process; one keeps imbibing fresh knowledge and unlearning or discounting some supplanted by the former. The study of learning is important in many different fields. Teachers need to understand the best ways to educate children. Psychologists, social workers, criminologists, and other human-service workers need to understand how certain experiences change people's behaviors. Employers, politicians, and advertisers make use of the principles of learning to influence the behavior of workers, voters, and consumers (Encarta 2006). Learning is closely related to memory, which is the storage of information in the brain. There can be no learning without retention and retrieval, hence, the emphasis on meaningful learning and the discouragement of rote learning. Psychologists who study memory are interested in how the brain stores knowledge, where this storage takes place, and how the brain later retrieves knowledge when needed. In contrast, psychologists who study learning are more interested in behavior and how behavior changes as a result of a person's experiences.

Different theories of learning help educational psychologists understand, predict, and control human behavior. To understand a child's emotional aversion to school, the respondent (or classical) conditioning theory originated by the Russian physiologist Ivan Pavlov (cited in Berliner, 1993) may be used. Pavlov's theory describes how stimuli that occur together may come to evoke similar responses. To inquire about the origins of a child's disruptive classroom behavior, the operant (or instrumental) conditioning theory of Thorndike and the American psychologist B. F. Skinner may be applicable. This theory describes how rewards shape and maintain behavior. School violence and vandalism may be partially understood through the social-learning theory of the Canadian-American psychologist Albert Bandura (Zulueta, 2006) which describes the conditions under which people learn to imitate models. Information-processing theory is used to understand how people solve problems by analogy and metaphor (Berliner, 1993).

Theories have been advanced to explain student achievement or underachievement in the classroom. One such theory is the cultural deprivation theory, which Doronila (1989, cited in Ababa, 1998) used and elucidated in her study. She said:

> *When the educational process is viewed as the learning of desired knowledge, attitudes or skills according to the criteria set by the school, discontinuities between objectives and outcomes are explained in terms of the cultural deprivation. That is, the student's failure to learn the desired educational outcome is due to the fact that his early home experiences do not transmit the cultural patterns necessary for the type of learning characteristics of the school and of the larger society.*

Laurence (1992) cited the theory on teaching through modeling. Social theory, as developed by social psychologist Bandura (1977) and his associates, posits that individuals learn new behavior primarily through a process of modeling the behaviors of others. In contrast to other schools of psychology that maintain that behavior is mainly a function of an individual's intention or goals (Cognitive theory) or external reinforcement (behaviorism), social learning theory argues that individuals learn complex behavior patterns vicariously, through a process of observing and imitating models over time.

Conceptual Framework

Public and private high schools aim to produce graduates who possess the values of the institution anchored on their mission and vision. Structuring an instrument based on valid theoretical support and background can promote teaching excellence, student achievement, and outcomes. But the issue that should be raised is whether factors associated with student's performance could

serve as an indicator or predictor of future student performance. The possible determining school factors are the prevailing attitudes of students and teachers attitudes towards mathematics, professional background of teachers, school facilities, admission requirements, student evaluation procedures, culturally-oriented behaviors of students and classroom dynamics in mathematics among high schools in the selected City Public National High Schools in Mindanao.

Research Methodology

This study made use of mixed methods but leans more heavily toward the quantitative design to answer the research questions. However, as expected of cultural studies, the qualitative aspect is allotted the space or importance it merits. In the data-gathering phase the following techniques were used: classroom observations and informal and formal interviews besides the questionnaires for high school mathematics teachers and students. Quantitative data were collected through an Inventory for Teachers and an Attitude Scale for students. This design involves collecting data to test the hypotheses and draw results that could establish the relationship between different variables that are the foci of interest of the study. The research tried to establish the factors associated with the Muslim students' academic performance in the three City Public National High Schools in Mindanao representing three regions namely; Marawi City National High School located in Marawi City, the provincial capital of the Province of Lanao del Sur which is located on the shores of Lake Lanao (Region 12); The Zambuangga City National High School is located at Don Alfaro street, Tetuan, in the City of Zambuangga (Region) and; the Cotabato City National High School is located at Datu Sensuat Avenue leading to the Office of the Regional Centers (ORC) in Cotabato City (ARMM Region).

The total research sample is distributed across the three regions as follows: one hundred fifty (150) from Region 9, one hundred fifty (150) from Region 12, and one hundred fifty (150) from ARMM. They are all Muslims (Maranaos, Tausogs, and Maguindanaons). Sample A consisted of four hundred fifty (450) Muslim Mathematics high school students enrolled during the Academic Year 2008-2009 in the three selected City Public National High Schools/Regions in Mindanao (ARMM, Region 9, and Region 12). Sample B consisted of the respective Mathematics teachers of the Muslim students from each school. The two samples were drawn by non-probability sampling, specifically purposive sampling. In selecting the three national high schools, the researcher considered the accessibility and the peace and order condition as the prime criteria in selecting the schools.

The research instruments used were adapted from the research of Ababa (1998); The Attitude Inventory Scale for Mathematics Teachers which was designed by

Sibal (cited in Ababa, 1998) and the Attitude Inventory Scale for Students by Ibe (1990). For easy comprehension of items by Muslim students the instruments were translated into Meranao, Tausog, and Maguindanaon. A classroom observation guide was also prepared by the researcher for her use in the observation phase of the inquiry. The data obtained were classified, tabulated and converted using statistical software. Percentages were used to describe teachers and students' characteristics from each school based from the Attitude Inventory for teachers and the Attitude Scale for students, respectively. The Pearson Product Moment Correlation Coefficient was employed in the testing of the null hypotheses at 5% level of significance through the use of the SPSS program package.

Teacher qualification was quantified based on these components (Ababa, 1998): *educational attainment* (75%), *teaching experience* (20%), and *attendance in in-service mathematics seminars/trainings* (5%). Educational attainment was treated according to the teacher's level any degree finished given 50 points; an undergraduate mathematics major is given 55; a master's degree holder got 60; a Master's degree in mathematics education earned 65; Ph.D/Ed/D in other fields got 70; a Ph.D in mathematics education was assigned a perfect 75. Points were added to teachers who acquired advanced credits in their professional growth or teachers (not mathematics majors) who acquired training in mathematics teaching. A maximum of 20 points were given to teaching experience, one point for every year of teaching. Only trainings/seminars in mathematics attended by the teachers from 2000 and up were credited; one point was earned for every seminar in mathematics attended for a maximum of five seminars.

Findings

Based on the statistical computations the findings are quantified categorically according to the variables investigated and listed in the statement of the problems in the study.

a. Evaluation of Student Learning and Progress

In Zamboanga City National High School, 12 teachers gave 15% for *quizzes*, 2 for 25%, one for 30% and one for 20%. For *periodical exams*, out of 16 teachers, 14 teachers gave 15%, and 2 assigned 25%. For *assignments*, 4 teachers gave 10%, 4 for 15%, 2 for 25%, 5 for no point, and one for 5%. For *class recitations*, 9 teachers give 30%, 5 for 15%, one for 10%, and one for 20%. Regarding *attendance* 13 teachers assigned no points, while 3 teachers gave 5%. For *projects*, 5 teachers gave 25%, 4, only 15%, another 4 gave 10%, and 2 no points, and one, 20%. Lastly, for *unit tests* 8 teachers gave 15%, 4, 25%, 2, 10%, and 2, 20%. Seven bases or criteria constituted the ZCNHS teacher's grading system, but variation in the weights assigned each were noted.

In Cotabato City National High School teachers' evaluated the learning progress of their high school students according to the following criteria: Teacher 1 and 5 did not indicate the percentages but accordingly they administered quizzes and periodical exams, and required assignments, class recitations, attendance, and others for evaluating their students. Teachers 2 and 3 adopted a uniform percentage for *quizzes* (15%), *periodical exam*, 15%, 10% for *assignments*, 30% for *class recitations*, 10% for *attendance*, and 20% for *projects*. Teacher 4 assigned 15% to *quizzes* 15% to *periodical exam*, 15% to *assignment*, 25% to *class recitations*, 15% to *attendance*, and 15% to *recitations*. Teacher 6 gave the following weights: 15% to *quizzes*, 15% to *periodical exam*, 15% to *assignments*, 15% to *class recitations*, 10% to *attendances*, and 30% for others. The five teachers of the CCNHS employed uniform percentages for *quizzes* and *periodical exam*.

In Marawi City National High School they had their own scheme for evaluating students learning. Teachers 1, 2, and 3 adopted a uniform percentage for *quizzes* (20%), Teachers 1 and 3 gave 20%, and Teacher 2, 25% for the *periodical exam*. Teachers 1 and 2 used a uniform weight for *assignments* (15%) and Teacher 3, only 10%. For *recitations*, Teachers 1 and 3 gave 25%, and 10%, respectively. Teachers 2 and 3 assigned 5% to *attendance* while teacher 1 gave no points. Teachers 1 and 3 gave 20% for *unit tests*, and Teacher 3, 25%. The three teachers adopted a uniform percentage or weight for *quizzes* only. The three schools show a sound grading system, assigning different weights or values to quizzes, periodical examinations, assignments, recitations, attendance, projects, and unit tests, which are the common bases for evaluating student learning and progress. MCNHS gives quizzes, periodical tests, assignments, recitations, projects, unit tests, but require no projects for evaluating students' performance.

The greatest variability is seen in the giving of weight to recitation and importance to projects. There is a discernible tendency to uniformity or consensus on the weight of quizzes and periodic examination which are the traditional or more time-honored bases for evaluating students' learning progress. However, there are no significant differences among the three national high schools in terms of their Muslim students' Mathematics GPAs based on two grading periods.

b. Conditions of Mathematics Teaching-Learning in the Three City National High Schools in Mindanao.

The medium of instruction used by non-Muslim Mathematics teachers is a combination of English and Filipino (their own vision of bilingualism), but heavily leaning on English language while Muslim teachers use a mixture of English and Filipino, with frequent recourse to translation to the native language or dialect whenever students show comprehension difficulties.

Out of four hundred fifty (450) respondents 70 or 15.56% Tausog students, 93 or 20.67% Maguindanaon students, 89 or 19.78% Meranao students, or a total of 56% preferred Muslim teachers; this number constituted a majority. Fifty six percent (56%) of the students want Muslim Mathematics teachers for the advantages that accrue through a common cultural-linguistic background. They expect greater understanding of their needs. The most common instructional materials used by the teachers in mathematics were chalkboard, graphing board and eraser. The six observed teachers come to class on time with prepared lesson plans, a sheet of Manila paper outlining the day's lessons, and devices to illustrate the lessons. They use such routine or formulaic remarks as "very good" for positive feedback and showed slight variations in their choice and use of techniques -- e.g. storytelling or sharing one's experience. Conditions of mathematics learning in the three schools are good. The classrooms are big enough to provide an atmosphere conducive to mathematics learning. The good conditions could explain why the 2 grading periods' GPAs of the Muslim high school students of the three public national high schools are good.

c. School Characteristics

Teachers' qualification was evaluated based on these components adopted from Ababa, (1998): educational attainment (75%), teaching experiences (20%), and attendance in in-service mathematics seminars/trainings (5%). The coefficient correlation between ZCNHS Muslim students' GPAs versus Zamboanga City Muslim students Mathematical Inventory scores turns out to be insignificant and shows no correlation. Likewise the coefficient of correlation between CCNHS Muslim students' GPAs and Cotabato City Muslim students' Mathematical Inventory reveals no correlation, thus an insignificant result. The coefficient of correlation obtained between MCNHS Muslim students GPAs and Marawi city Muslim students' Mathematical Inventory shows also no correlation and significant result. Therefore the coefficient of correlation between Muslim students' Mathematical Inventory Scale and Muslim students' GPAs among the three City Public National High Schools in Mindanao shows no correlation. It is clear enough that the two variables -- GPAs and attitudes -- are not linked whether positively or negatively.

d. Facilities, equipment, and classrooms

The three schools provide complete equipment and facilities. ZCNHS has a separate building for the gymnasium, another building for the library. The three schools have rooms equipped with computers to accommodate their students, although a few sets needed repair. The three schools have enough rooms to house their students. In these three schools, every student has a chair to sit on, teachers each have a table and a chair and every classroom has at least two to three chalkboards with accompanying essential devices.

ZCNHS has a shifting time from 6 am to 12 am for first year and third year and 12 am to 6 pm for second year and fourth year. It has approximately 52 to 60 students in each room. There are thirty six (36) sections for fourth year, thirty six (36) sections for third year, forty one (41) sections for second year, and forty four (44) sections for first year.

Construction of a building is ongoing at CCNHS to house their students. The time shifting is from 6 am to 12 am for first year and third year, 12 am to 6 pm for fourth year and second year, and 6 pm to 12 pm for night classes. It has 50 to 60 students in each room. There are twelve (12) sections for fourth year, twelve sections for third year, eleven (11) sections for second year, twelve (12) sections for first year, and two (2) sections in each year level during night time, from 6 pm to 12 pm. MCNHS has a regular time from 7 am to 12 am, and 1 pm to 5pm. There are five (5) sections for fourth year, seven (7) sections for third year, nine (9) sections for second year, and twelve (12) sections for first year. The three schools have libraries to cater to the needs of their students. The ZCNHS has one building intended for their library only; it is the only school among the three that has a developed or well-stacked library to accommodate their students.

e. Attitude of Students towards Mathematics

With regard to attitude toward mathematics as measured the by Math Attitude Inventory among Tausog students, majority of the Tausog students reported that the statements below are either "generally true of me" or "very true of me":

> *I am interested to acquire further knowledge in mathematics- 58.00%. I think I have more chances of becoming successful if I am good in mathematics 54.00% I enjoy going beyond the assigned work in mathematics and I try solving more than what is expected of me- 52.00%. When I work on mathematics problems, I find that my thinking and reasoning are sharpened- 51.00%*

The Attitude Inventory Scale towards Mathematics administered to Maguindanaon students showed them answering either "generally true of me" or "very true of me" to the statements listed below:

> *I am interested to acquire further knowledge in mathematics- 66.78%. I think I have more chances of becoming successful if I am good in mathematics- 60.00%. I find mathematics useful for problems of everyday life- 56.30%. I enjoy going beyond the assigned work in mathematics and I try solving more than what is expected of me – 50.00*

Below are the results of the Mathematics Inventory Scale administered to the Meranao students in MCNHS. They expressed their attitudes by answering either "generally true of me" or "very true of me" to this list of statements:

> *I am interested to acquire further knowledge in mathematics- 90.70%. In mathematics I am not satisfied with just a passing grade; I want something really high - 70.60%. I find mathematics useful for problems of everyday life - 70.00%. I consider mathematics my most difficult subject – 64.00%. Mathematics is a subject I have always enjoyed studying – 62.00%. Mathematics makes me more inquisitive about things which are not clear to me – 58.00%. The people I enjoy going with are those who are good in mathematics – 58.00%. I think my mind works well when doing mathematics problem – 58.00%. When I work on my mathematics problems, I find that my thinking and reasoning are sharpened – 57.40%. I think I have more chances of becoming successful if I am good of mathematics -56.70%. I always need someone to help me with mathematics because it confuses me – 54.00%. In school I thoroughly enjoy my mathematics classes – 51.40%. My favorite subject is mathematics – 51.40%. Of all my teachers, it is my mathematics teacher that I like best – 51.40%*

The overall result gives proof of proper motivation (e.g. the conviction that mathematics competence is vital to success and relevant for problems of everyday life, as well as useful in sharpening the mind). The confession of a hardly negligible or insignificant number of MCNHS students (i.e., mathematics as "the most difficult subject" and "confusing", hence, the need for help) should however alert the concerned teachers to a serious problem.

f. Characteristics of the Muslim Teachers

Based on the self-reports and credentials, the mathematics teachers of Muslim students in the three city public national high schools, who participated in this study, have adequate and even impressive background in mathematics. All the twenty five (25) participating mathematics teachers have the minimum requirement, that is, a Bachelor of Science in Education major in Mathematics degree or a Bachelor of Science in Mathematics, except one who is a graduate of the Bachelor of Science in Engineering Program but a holder of a master's degree in Mathematics. Eight (8) of them have a master's degree in Mathematics. There is indication also that they have adequate updated training through attendance at seminars in Mathematics. They are all doing what is due to their students and are always 'on their feet' since their school heads are monitoring their teaching performance.

g. Attitude of Teachers towards Mathematics

The composition of the twenty five (25) teachers is as follows: two (2) Meranaos, two (2) Tausogs, fourteen (14) Zamboangenea/os, one (1) Roman Catholic, two (2) Maguindanaons, two (2) Ilonggo, and one (1) Visayan. The majority are non-Muslims. Most of the teachers answered "true of me" or "very true of me" to the following statements designed to draw from them self-evaluative responses:

> *I enjoy teaching math- 92.00. I am highly motivated and enthusiastic to teach mathematics- 88.00%. I continuously motivate my students to make them learn mathematics- 88.00%. When I teach I use English and I use the dialect for emphasis- 80.00%*

This eighty percent and above are important responses revealing a common idea or attitude of the teachers: they enjoy mathematics teaching, and are highly motivated and enthusiastic in teaching mathematics. When they teach they use English and a native dialect to communicate more clearly and effectively with their students. Majority of teachers also answered "generally true of me" or "very true of me" to the following statements:

> *I make extra effort to update myself on the new developments and ways of teaching mathematics- 76.00%. When I teach mathematics, I relate it to situations and experiences that are familiar to my students- 76.00%. I look forward to the time I spend with my mathematics classes- 72.00%. Among all my subjects, it is in math where I feel most at ease- 72.00%. I try various methods and strategies in teaching mathematics- 68.00%.I derive personal satisfaction from teaching high school mathematics- 68.00%. I consider mathematics teaching as a professional commitment- 68.00%. Even when still in college, I was already interested in mathematics teaching-64.00%. My enthusiasm to teach mathematics is evident in my day-to-day teaching activities- 64.00%. I believe that the math class period should be allotted more time compared with other subjects- 60.00%*

These expressed attitudes among mathematics teachers in the three City Public National High Schools in Mindanao take on greater meaning considering the fact that majority of them are non-Muslim. Out of 25 mathematics teachers, only 6 are Muslims. The majority of teachers have to contend with the dominant culture in the setting where they find themselves. It is a culture quite unfamiliar and alien to them. This cultural divide increases the challenge, or compounds the problems normally encountered like resistance or negative attitude to mathematics, language problem, and poor foundation (lack of mastery of basic mathematical concepts and operations.

h. Cultural Orientations and Practices Manifested by the Students
(Culled from Self-Reports, Observations and Interviews with the Teachers of Muslim Students)

Thirteen Mathematics teachers responded to this statement: ***Behavior of Muslim Students in Mathematics class that make him/her happy as a mathematics teacher*** with the following answers: What makes them happy is when Muslim students can do well and behaves well; are responsible, creative, organizing, solving, working; have initiative, and are enthusiastic, are patient to solve problems; proud to be able to solve math problems correctly; good in math, cooperative, attentive; show genuine interest; many of them are prove good in math, good in math/numbers and participative, recite, and say "thank you" because they have learned something from the subject; they are responsible or heedful of their teachers' instructions; honest, good, industrious, kind and show curiosity. Many of the teachers said they feel gratified when students are attentive, show genuine interest, and take pride in their progress.

Fourteen (14) Mathematics teachers responded to this particular statement; Problems ***encountered by teachers in teaching Mathematics to Muslim students.*** with these answers: not studying; not practicing; not reciting; hardly participating; shy; not responding; not working on/making an assignment; misbehaviors; no interest; taking the subject for granted; poor reading comprehension; poor foundation in the four fundamental operations and such concepts as decimals, fractions, and integers; poor in the English language; no materials for use in math activity like graphing paper, ruler, pencil, protractor, calculators, etc.; inattentive during discussions; impolite, lax, mischievous; no retention; less comprehension; poor comprehension; can't recall basic concepts, rules and laws of math; they have no mastery of the four fundamental operations; lack of interest; negative attitude to the subject; very low retentive memory specially in the four fundamental operations; very noisy; and do not observe punctuality. These myriad problems could be grouped into six clusters or categories: classroom management problems; language problems; motivational and attitudinal problems; lack of materials needed for classroom activities; bloated class size or overcrowding; and poor foundation. These problems are interrelated -- e.g. bloated class size as the cause of most classroom management problems and motivational and attitudinal problem as resulting from lack of essential materials and poor foundation.

Most of these problems, however, are not exactly insoluble and should never be used as excuses for giving up on math students, or resignation to the futility of all efforts. The thirteen (13) mathematics teachers had these responses to the pertinent statement; ***Instances or times when teachers get impatient or*** **angry**

with Muslim students, and they said; talking when teacher is discussing; following or mimicking what she is saying; not listening; misbehaving and does not know the lessons; very talkative and noisy; asking and begging for answers; asking classmates to provide materials for math activity; doing other things during discussions/impolite, that are not related to mathematics; making their assignment in the class; they just copy answers from classmates; they do not want to try; talkative; insensitive; not active in any board activities; and seldom mindful of their behavior.

Six (6) teachers responded to this statement: ***On teachers reprimanding Muslim students in the class and some reactions of Muslim students when reprimanded*** *and they said;* they just keep cool and do not worry; absenteeism; non-compliance with the requirements, and misbehaving; resentment; using foul language, like the common "bilat ina mo"; most of the students would just listen and say "sorry", and some are angry while others will just keep quiet. Most of the Mathematics teachers do not reprimand a Muslim student in the class.

On maratabat, translated as pride or honor is recognized by sociologists as a fundamental motivating force over a wide range of behaviors and actions among Muslims; fifteen (15) mathematics teachers responded to this particular question on *maratabat* with these answers: shutting or slamming the door before going out", when their fault is mentioned; when their ego is touched in front of others; when their attention is called for misbehaving; have done something wrong; arrogance; when found guilty, some say "sorry"; some do not want to be corrected and show resentment; *maratabat* is challenged, by or fuels competition; negative reactions when attention is called; when able to solve problems on the board they are happy; talkative and noisy; some are arrogant; they do not participate in board works because they are afraid that their classmates will discover their inadequate knowledge of the basics mathematics; datuism; and commanding or dominant.

In terms of ***Good effects of maratabat on mathematics teaching; t***en (10) teachers enumerated some good effects of *maratabat*: they prove to themselves and others that they have talent; striving/exerting effort; encourages or challenges them to learn; can boost student morale; they are afraid of their God "Allah" if they do not obey; can build self-esteem; and hereditary bloodline.

In terms of the ***bad effects of maratabat on mathematics learning; t***en (10) teachers provided answers to this question: not doing at all what is required of them, and neglect their studies; it develops self-conceit and covetousness; personal and ethnic differences; others are arrogant and noisy; and inferiority complex.

It is clear that *maratabat* as a cultural value works in two ways; it has a positive and a negative side. The different manifestations shown by Muslim students lend themselves to classification into the positive or constructive and the negative or harmful. The challenge to the math teacher is to develop techniques or strategies that appeal to, or tap into the positive aspect of *maratabat* so that it can work *for*, instead of *against* Muslim students. Teachers must never lose sight of the fact that *maratabat* is not a personal matter; it is collective, involving the whole clan and even ancestors.

Conclusions

On the basis of the findings of this inquiry, it is tentatively concluded that the cultural orientation and high school context factors probably help explain positive or low math performance associated with the Muslim students in the three City Public National High Schools in Mindanao such as *maratabat*, fidelity to Islam, motivation to succeed, school and home environment, close kinship, peer influence, and availability of instructional facilities. Explicit or serious attention to these factors which have the potential for contributing to the enhancement of the academic performance of the Muslim students could produce salutary effects on the math learning progress or achievement of Muslim students across the regions in Mindanao. ***M****aratabat (extreme pride),* close family ties, and fidelity to Islam are factors associated with the Mathematics performance of the Muslim students in the three City Public National High Schools in Mindanao (ZCNHZ in Region 9, CCNHS in Region 12, and MCNHS in ARMM). There may be other factors that contribute to, or influence the academic performance of the Muslim students such as low motivation, lack of financial support, and parents' assistance, lack of interest, poor personality development, teachers' attitudes, poor foundation and adjustment problem, poor study habits, and skills or learning strategies, negative attitudes and others. These invite further exploration or delving into.

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