

## Factors Affecting the Teaching of Public High School Mathematics Teachers in the Province of Lanao del Sur and Maguindanao

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### Abstract

This study was conducted to provide a comprehensive description of the factors affecting the teaching of Public High School Mathematics Teachers in the ARMM, specifically, in the select provinces of Lanao del Sur and Maguindanao, and Marawi City. Through the use of quantitative and qualitative research design, this study examined whether or not the identified factors affecting the performance of mathematics teachers established during the preliminary survey conducted in October 2011 at two (2) public high schools with sizable student population in Marawi City also hold true in the public high schools of the two provinces including Marawi City. The identified factors became the baseline information of this study. These factors are: students-related factors, teachers-related factors, administrators-related factors, school support facilities, school curriculum, parent and community attitudes, and socio-cultural setting. Simple and stratified random sampling techniques were used for the respondent size of six hundred and twelve (612) students, thirty-two (32) teachers, and twenty-three (23) administrators. The instruments used for data gathering were: survey questionnaires, interviews, classroom observation and teachers' beliefs, students' final grades in their third year level and second grading period grades in their fourth year level and observation guide to obtain a picture of the physical environment of each school. The findings of the study are: (1) very few mathematics teachers which is a mathematics majors; (2) teaching strategies or techniques used by the teachers were not updated or abreast with the new trends of teaching practices; (3) school administrators' support for the professional growth of mathematics teachers and school facilities was very inadequate due to lack of funds; (4) the school curriculum did not directly respond to the needs of the learners; (5) the students' and teachers' attitudes on learning and teaching did not directly lead to better and productive learning and teaching outcomes; (6) the parents' and community attitudes are not geared to better learning of the students; and (7) the socio-cultural setting had an effect on students' and teachers' learning and teaching performance. Thus it is recommended that the process of recruitment, trainings and seminar must be strictly followed and regularly implemented respectively.

**Keywords:** factors in teaching, mathematics teaching, ARMM region

### Introduction

In the educational realm, the study of teachers and their teaching careers has been "dynamic and impassioned" for a long time. Since dynamism connotes advancement it is assumed that through

time, teaching should have been “improving,” that is, in terms of quality of results. However, one serious problem faced by many educators and policymakers in Mindanao, particularly in the ARMM, has been the question whether teaching in this part of the country has been improving or deteriorating; if the latter, are teachers blameworthy. There is the further question whether the teachers’ own views on this matter have been considered and whether or not learning is solely dependent on teachers, or also influenced by other factors. The possibility that “other factors” may play significant roles cannot be discounted. It is, however, deemed more profitable to look deeply into the teachers’ characteristics, beliefs, practices, and attitudes since these are essential to the educational process.

Moreover, several other factors significantly affect their teaching performance. Mathematics teaching is not just about teaching numbers. Math teachers must have sufficient understanding in different mathematics concepts and principles. Mathematics teachers’ play challenging roles or functions expected of mathematics teachers, it is no wonder that very few embark on getting professional training in this field. This fact results in scarcity of qualified and competent mathematics teachers. The ARMM Basic Education Plan discusses teacher shortage as a chronic problem. Accordingly, findings on the 2007 BEIS revealed that there are only 1.2 teachers. Results of the National Achievement Test (NAT) have not been very encouraging. As stated in the ARMM Basic Education Development Plan, “This limited pedagogic and learning approach, as well as low teacher competence in core subject areas, affects student performance, as reflected in the National Achievement Test (NAT) and the Region-wide Assessment in Mathematics, Science and English (RAMSE). In the 2006-2007 NAT, ARMM was still one of the poorest performing regions.” The same is true with MSU-SASE results.

Data from a study conducted by the former MSU Asst. Vice Chancellor for Academic Affairs Dr. Benaning Omacaan revealed highly significant difference in the SASE mean scores for the years 2004, 2005, 2006, 2007, and 2008 of MSU high schools and public high schools in Lanao del Sur in favor of the MSU high schools. This means that SASE takers from the MSU high schools performed better than takers from the public high schools. Moreover, the number of admission in MSU high schools and public high schools in Lanao del Sur to the MSU Main Campus at Marawi City showed that in S.Y. 2007-2008 only 16.94% out of 1,169 total of enrollees came from public high schools and 83.06% of them came from MSU high schools. In S.Y. 2008-2009, only 24.02% out of 716 totals of enrollees were from public high schools and 75.98% of them were from MSU high schools and, finally, in S.Y. 2009-2010 only 2.65% out of 2,906 total enrollees were graduates of public high schools and 97.35% of them were graduates from MSU high schools. This low admission rate of students from public high schools might be due to a poor foundation that could be attributed to several factors, one of which most probably is related to teaching practices issues. More data on SASE results were generated from the Electronic Data Processing (EDP) Department of the MSU Main Campus in Marawi through the assistance of its head, Prof. Ronald Silvosa, upon instruction from the Vice President for Academic Affairs and SASE Chairperson Dr. Alma E. Berowa. The result revealed that the weighted average scores in mathematics of the respondent schools participated in the SASE examination were 8.913 in SASE 2010 and 11.812 in SASE 2011. The weighted average scores of the public high schools in the Province of Maguindanao are 8.050 in SASE 2010 and 11.941 in SASE 2011. Both results show that the students from the two provinces performed poorly in the MSU-SASE. The poor performances of these public high schools can be attributed by different factors which may include of having poor preparation in mathematics instruction, which can be also be most possibly traced back to mediocre teaching practices. The abovementioned issues point up the need to investigate the ability of public secondary high school teachers in the Province of Lanao del Sur and ARMM region.

Among the compelling reasons for conducting this study is the usual claim that the most overlooked area in the country is the ARMM. Traditional politicians have been said to have directly and indirectly interfered in the educational bureaucracy, resulting in inadequate facilities, mediocre management of schools, faulty recruitment process, and inadequate training of teachers, among a myriad of problems. As a native of this place, the researcher considered it his responsibility to explore possibilities of helping alleviate the plight of the Bangsa Moro particularly in the field of mathematics education. As an initial step, he sought to find out what brought about the problems in the teaching of Mathematics in this region. Finally, looking into this problem would benefit not just the top management of the Department of Education but most importantly, it would profit students, teachers, parents, and the community. Teachers and administrators would be given opportunities for reassessing teaching practices and school capacity. Students would be afforded better opportunities to learn and hopefully pursue college and earn degrees. When they get jobs, they would become more useful citizens of the country and help alleviate poverty in their respective communities.

### **Respondents of the Study**

Respondents were limited to the thirty-one (31) Public High School Mathematics Teachers (from first year to fourth year level), six hundred and twelve (612) fourth year high school students and twenty-three (23) school officials or administrators of the respondents' schools in two provinces, including Marawi City. In view of the huge number of schools and students in the marked out area and most importantly, the uncertainty of the prevailing peace and order situation in some remote municipalities, a sample had to be drawn from the identified population using both random and stratified modes.

### **Research Design and Methods**

This study made used the combination of quantitative and qualitative research design. Discussion on the procedural flow of the research as well as the demographic profiles of the respondents with interpretation and implications are presented. More specifically, it utilized the descriptive-correlational research design as it investigated the different variables involved in this study. The variables, which were considered as the factors affecting the teaching of mathematics teachers, are analyzed, compared and eventually classified and ranked. These factors included the following: teachers' attitude, personal profile, educational background, teaching experience and strategies; the administrators' management support and supervision; school facilities and physical environment; the students' attitudes; the parents and community constituents' attitudes, and the socio-cultural setting. This study used triangulation of data to validate the results of one instrument with the other two instruments. This procedure means that in order to generate the data for this purpose, three sources of data were used for this investigation, namely: surveys, interviews and classroom observations.

The basic concepts and criteria asked and collected were reflected in the three instruments. The survey questionnaires and interviews were applied to the fourth year high school students, mathematics teachers and the school administrators as research respondent in each respondent school. The classroom observation for mathematics teachers was done with schools A, B and G (Please see attached table of letter symbols for schools). Data from the three instruments were then documented and integrated. Several stages were followed in the conduct of this study, as shown in the attached schematic diagram. The first stage was the preliminary site visit for actual observation and benchmarking of the schools identified by the researcher with regard to school environment and school facilities and also to establish rapport prior to the interview. The second stage was the development of the three instruments, which included the validation of the survey questionnaires by an expert and then followed by pilot testing. The third stage was the conduct of survey questionnaires with the respondents. The fourth stage was the

conduct of interviews with the students, mathematics teachers and administrators. It also included the classroom observation of the mathematics teachers. The final stage was the analysis and interpretations of the collected data. For reliable and valid study data, the researcher performed a preliminary survey among mathematics teachers in two government high schools with a large enough student population to find out the factors affecting the teaching of mathematics teachers. In this preliminary survey, the following factors were established: students-related factors, teachers- related factors, administrators-related factors, school support facilities, school curriculum and parents and community attitudes, and socio-cultural setting.

### **Significance of the Study**

This study is an attempt to examine and assess the factors affecting the teaching of public high schools mathematics teachers in the ARMM. The result of this study is hoped to: 1. Provide teachers with reliable feedback on the following issues so that they can explore avenues for self-improvement: a) Exposure to seminars and trainings; b) Expert educational qualification; and c) Teaching strategies and techniques. 2. Provide the school management with reliable feedback on what they might contribute towards the improvement of the teaching of mathematics in their school, particularly support for teachers, implementation of intended curriculum and improvement of school facilities; 3. Help shed light on the part or role of the community constituents and the parents, that is, to what extent they could contribute towards the improvement of teaching mathematics in the schools; 4. Help shed light on the part of the policymakers and/or the curriculum designers for the inclusion of teachers' pre-service and in-service education as part and parcel of teachers' pre- qualification for teaching, i.e., various training and seminars for teachers' experiences and professional growth must be embedded in the curriculum; 5. Provide the Department of Education (DepEd) and the Department of Science and Technology (DOST) factual data they can use in designing or redesigning programs toward assisting the different public high schools in improving the teaching of Mathematics in the ARMM; and 6. Contribute to the fund of knowledge in mathematics teaching.

### **Collection of Data**

The researcher identified a home base in each school district, a place that was strategically located between the remote municipalities within the two provinces, which served as the base for him to work out the data collections and conduct other research instruments needed in this study. Prior to the conduct of this research study, experts from Mindanao State University were consulted on the 'do-ability' and significance of the research. Then, preliminary visits and consultation with some Division Superintendents, School Principals and Teachers of the eight (8) identified respondents' schools, were also made to establish good rapport. Letter requests seeking permission for the conduct of the research study in the respondents' school were then given to the Division Superintendents down to the school Principals by the researcher. These permissions were readily granted (see Appendices E.1 – E.7 and F.1 – F.8 respectively). Moreover, separate letter requests were also given to the three (3) sectors of respondents, namely; the students, teachers and administrators (see Appendices A.1–A.3). The following activities were done relative to this purpose: 1. Home base area where consolidation of data were made. For the respondents' school within the province of Lanao del Sur and Marawi City, the researcher's home was identified as his home base, as the respondents' schools were accessible and could be traveled back and forth within a day. However, for the respondents' schools in the province of Maguindanao I and II, a rented hotel room in Cotabato City was the "home base", as these schools were almost equidistant from Cotabato City. 2. Hiring a research assistant. The research assistants from the MSU Main Campus at Marawi and from the respondent schools were hired to help the researcher administer the distribution of the instruments to the respondents including their retrieval. The qualifications of these research assistants were at least a college graduate and able to express explain clearly the procedure, as well as the questions both

in the English language and in the vernacular of the respondents' school. The identification and selection of these research assistants were made with the consent and approval of the respective school principal.

There were three (3) and two (2) hired research assistants in the province of Lanao del Sur including Marawi City, and the province of Maguindanao respectively. These hired research assistants were properly briefed and oriented about the objectives of this study, especially their role and duties, as required.

3. Administration of the survey questionnaires. These questionnaires were given to the three sectors of respondents of this study. For the students whose sample size in each respondent's school were indicated and determined in Respondents A, the questionnaires were given to them during their regular class period in the presence of the researcher, in order to readily answer and or provide added clarification during documentation of different activities. The teachers and administrators were given in their respective offices and they were given enough time to answer the questionnaire developed for them.
4. Interview. This instrument was administered by the researcher himself and was done with all the mathematics teachers in each respondent school after they were done with the questionnaire. It was conducted to validate and supplement the data collected from the teachers' responses on the questionnaire. The interview was done in their respective offices and lasted about 25 to 40 minutes per respondent. It was properly documented with the use of a video camera to serve as back- up files. The students were randomly selected interviewed by the researcher during their recess period in their own classroom. For the administrators, they were purposively chosen depending on their availability and willingness. But there were at least three administrators in each respondent school who were interviewed in their respective offices with the exception of one school, which had only two officials interviewed.
5. Classroom observation. The classroom observation for mathematics teachers was conducted by the researcher himself and was done with schools A, B and G only. The reason for this was precarious peace and order condition in some remote municipalities and the large amount of time the activity would consume if more sites were covered. These respondents' schools were stratified and randomly chosen in each province and the City of Marawi and were represented then approved by the panel members. The schedule of classroom observation was agreed upon by the researcher and the teachers. The results of this observation were properly documented.
6. Teachers' beliefs. The teachers' beliefs forms were given to mathematics teachers after they were done with the questionnaire and were administered by the researcher himself.
7. Students' Card. The students' card, which referred to their final grades in their third year and second grading grades in their fourth year level, were retrieved from the Registrar's Office and some from their advisers.
8. Observation-guide to capture the physical facilities and/or environment of the respondents' school. This observation- guide form was administered by the researcher to produce an account of the availability of playground, basketball and volleyball courts, cafeteria, comfort room, etc...and open stage of the respondents' school, especially if repair and maintenance was being made by the school administrators. The data gathering activities were done on November 14 to December 15, 2011. All the information and data gathered were properly documented. Video-camera recording and journals of written descriptions were utilized by the researcher to ensure back up file and information which were deemed necessary in the final categorization and in-depth analysis of each respondent's responses in the instruments.

Statistical Treatment of Data To ensure the reliability of the outcome of the research data, the researcher separately organized and documented data based on what were to be measured quantitatively and qualitatively. As to its qualitative aspect, the data were thematically consolidated and continually reviewed and coded as the collection of data and data analysis were a simultaneous process in qualitative research, Creswell (1994). For the data to be quantitatively measured, the SPSS 17 program was used.

### **Treatment of Data**

All the data collected from the questionnaire, classroom observation and teachers' beliefs were encoded and pseudonyms of respondents' schools were used for confidentiality as mentioned in the respondents and sampling procedure of this study. The following statistical tools were then clicked from this SPSS 17 program and analysis and interpretation of the results followed. The Arithmetic Mean and Percentage were used to describe the demographic profile of the respondents, such as their age, gender, civil status, tribe, religion, educational qualifications and length of teaching practices or experiences. These were also used for finding the mean average of the respondents' responses on the questionnaire, teachers' beliefs and classroom observation. The Pearson Product-Moment Correlation Coefficient (Cr) was used to determine the significant associations between dependent and independent variables or between independent variables, i.e., between students' grades & teachers' attitude and or between students' attitude & teachers' attitude. The significant difference of respondents' responses on the questionnaires, i.e., responses between students and teachers on school facilities and or responses between teachers and administrators on teacher's leadership skill were identified through the use of Mann-Whitney U-test. This statistical tool was appropriate to use since the data were small and were ordinal. The Histogram Graphs were also used to visually and easily identify some variables' relationship, i.e., the mean effect of "rido or awidan" on students' studies and teachers' performance.

### **Summary of Findings**

This study is a modest attempt to provide a clear and comprehensive picture of the factors affecting the public high school mathematics teachers in ARMM and Lanao del Sur. Findings revealed that; 1. Among the 31 teacher respondents, 13 were graduates of the minimum requirement for professionals, a Baccalaureate degree. Nine were graduates of a baccalaureate degree with some units leading to a Master's degree. Three were graduates of baccalaureate degrees and were candidates for graduation for the degrees leading to Master's Degree. Only one of the respondents was a graduate of Engineering with Magna Carta units. Only two were graduates of a Master's degree other than Education; only one was a graduate of a Master's degree in Education; only one also was a Ph.D. candidate and another one a holder of a Ph.D. degree.

Generally, most of the teachers lacked expert educational qualification. This could certainly hamper teaching practices as indicated in the conceptual framework of this study. Teacher qualification is one of the potential factors affecting teaching, a sub-factor of opportunities for teachers learning, affects professional development involvement and vice versa. It also affects professional learning community which is a sub-factor of school capacity and teachers' knowledge which is a sub-factor of teacher capacity which shapes classroom practices and vice versa. 2. There were 14 teachers who had teaching experiences between 6-10 years; six teachers had 11-15 years; seven teachers had 16-20 years; and only 4 teachers had 21 - 33 years of teaching experiences. Teaching experience is important factors in teaching learning process. It also affects professional learning community, an aspect of school capacity and teachers' knowledge which is a sub-factor of teacher capacity that shapes classroom practices and vice versa. 3. On the issue of the periodic observation and implementation of teachers' seminars and trainings, responses of schools were "undecided," "unfavorable" and "highly unfavorable." This means that teachers were not given opportunities for learning, a potential factor affecting the teaching of mathematics teachers, more specifically professional development involvement and which in turn affects the teachers' qualification and vice versa. These qualifications and professional development involvement both affects program coherence and finally teachers' knowledge which is a factor of teacher capacity, another potential factor as shown in the conceptual framework of this study. 4. On the issue of the use of various teaching strategies, aids and techniques by the mathematics teacher, the respondents' responses of schools were likewise

unfavorable and highly unfavorable. This unfavorable result is believed to affect teaching as going back to the conceptual framework classroom practices such as employment of various teaching strategies, aids and techniques affect teachers' knowledge and vice versa. Classroom practices are affected by both program coherence and teaching technical resources and it affect students' opportunity to learn. 5. On the issue of the school curriculum the respondents' responses of the schools were "undecided" and "highly unfavorable." This means that there seemed to be mismatch between what the intended curriculum was and what was implemented. This could certainly affect teaching as based on the conceptual framework, program coherence under which curriculum falls, affects classroom practices which is a sub-factor of student opportunity to learn, one of the potential factors affecting teaching. 6. On the issue of school facilities, such as library resources, laboratory facilities and sports facilities, the respondents' responses of the schools were "undecided" and "highly unfavorable." The students' responses tend to lean toward "unfavorable." This means that these issues, being part and parcel of school system level factors which is a sub- factor of opportunities for teachers learning, affect program coherence and teaching technical resources and which in turn ultimately affects classroom practices as illustrated in the conceptual framework. The result came out consistently from the three instruments used (triangulated) such as observation, interview and questionnaire. 7. On the issue of the parent and community attitude, the respondents' responses of schools were "undecided" and "unfavorable." This results points to the absence of family and community support, as some students said that they were sometimes absent because of lack of funds for transportation expense and because they were required by their parents to help in the farm.. 8. On the issue of the socio-cultural factors relative to the students' studies, on socio- cultural setting relative to the teachers' performance in teaching, the respondents' responses of schools were "undecided" and "unfavorable." These factors are also related to community and family background that shape teachers' beliefs, knowledge, beliefs and practices; classroom practices; and student learning outcomes. 9. More studies need to be done about factors affecting teaching.

### **Conclusion**

Based on the gathered data, which have been carefully processed and analyzed, the following conclusions were drawn: 1. All of the public high schools mathematics teachers in this study have finished their undergraduate degrees but few were mathematics majors. Only one (1) out of thirty one (31) mathematics teachers was a Ph.D. holder, while only two (2) of them were masters' degree holder. However, these teachers had enough experience in teaching as not one of them has less than five years in teaching practices so that with this number of years in teaching, they must be equipped with better knowledge in the teaching profession. 2. The professional growth of these mathematics teachers were not well supported by the administration due to lack of funds.

Only limited seminars and training were attended by even a few teachers and their academic studies were likewise not encouraged for them. However, no teacher had a teaching experience of less than five years. This implies that all of these teachers were not new to the teaching profession and that their loyalty and dedication to the teaching profession may not be questioned. 3. The mathematics teachers' teaching strategies were not well- updated with the new trends of teaching practices. This still resulted from the fact that the schools did not have enough funds for further academic growth of the teachers. 4. The public high schools in the two provinces investigated had their own curriculum, in which Arabic subjects were part of the contents. However, this in effect shortened the time schedules of some subjects, including mathematics subjects. 5. The school support facilities of the public high school were not properly addressed and well maintained. In fact one (1) school showed no library and even those with libraries, there were not enough copies for textbooks and references.

In particular, there were more schools in the province of Lanao del Sur that lacked good chairs from some of the classrooms and no concrete basket-ball courts. However, there were more schools in Maguindanao province that lacked textbooks and references in the school library than in the province of Lanao del Sur. In general, the public high schools in the two provinces investigated did not have sufficient and suitable school facilities. 6. The school administrators were supportive of the mathematics teachers but they were limited by inadequate funding for the teachers' academic development program. However, the parent-teachers associations, for the same reason, were also reluctant to help the school administration for the learning of their child and for the school improvement and maintenance. Some schools have PTCA officers and in others, such a group did not exist. 7. The students' attitude toward their mathematics studies was not dedicated and inspiring. Their attitude was not attuned to effective learning, as manifested by their academic achievement through their final grades in their third year and second grading grades in their fourth year level. This may be accounted for by the lack of inspiration and follow-up support by their mentors, especially their parents. Furthermore, the teacher's attitude relative to their teaching performance was not effective and that it had an insignificant effect on students' learning. Similarly, the administrations' attitude is likewise not significant towards mathematics' learning.

The mathematics teachers had knowledge/understanding of the subject. However, as to the effect of mathematics teachers' knowledge/ understanding and their beliefs on the students' achievement, it is very clear. Similarly, the mathematics teachers' beliefs likewise had no significant effect on students' achievements. This study is based on their final grades in their third year and their second grading grades in their fourth year level.

The socio-cultural settings had an effect on both the students' studies and teachers' teaching performance. Thus, similar studies but more comprehensive ones may be undertaken to find out the students' and teachers' attitudes towards mathematics. It is also strongly recommended that once the prevailing peace and order in the ARMM provinces calms down, a similar study of this kind be undertaken and that the number of respondents' schools, students, teachers and administrators must be increased to find out if there would be some categorical changes in the results of this study. There must be a periodic assessment of school library resources and procurement of necessary books and other library materials. The top management of the public secondary schools might look into a review and improvement of curriculum, incorporating other subjects like Arabic and Islamic studies. Efforts for activating parent-teacher association, scheduling regular conferences with parents and sponsoring relevant lectures and seminars, such as lectures on parenting, may be considered by the school management.

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