
Implementation of Mathematical Investigative Approach among Intermediate Teachers

Florinel M. Babia

MAED

Master of Arts in Education- Educational Administration Engr. Nestor Ty Memorial Elementary School Tandag City, 8300 Surigao del Sur, Philippines
florinelbabia42@gmail.com

ABSTRACT:

This paper examined the implementation of mathematical investigative approach among intermediate teachers in Tandag District. It utilized descriptive method of research. The fact-finding research and data gathered were describe and subjected to a test of difference in the implementation of mathematical investigation approach and its implementation of seventy-nine (79) intermediate teachers. Most of the intermediate mathematics teachers have earned M.A. units but the degree is not vertically articulated in the field of mathematics. Implementation of mathematics investigation can be enhanced through the increase of sufficient knowledge and skills of mathematics teachers as the teachers pursue the continuing professional development (CPD). Thus, there is no significant difference in the implementation of mathematical investigation as to professional preparation of teachers in mathematics.

Key Words: Implementation, investigative approach, Intermediate Teachers

INTRODUCTION

Mathematics is a science. It embodies a logical sequence of thoughts and processes. It involves skills to be developed in order to understand the relationship of quantities (Hom, 2013). Thus, this study will

employ to examine the implementation of mathematical approach among intermediate teachers.

The vital role of mathematics has been cited by different authors; Perigrino (2000), Villame (2005), Sunga (2006), and Inching (2006). The effective procedures are asking questions that are very necessary because it serves as foundation in the correct answers (Perigrino, 2000). Villame (2005) stresses that open-ended questions are wonderful tools that promote pupils' creative thought, problem solving skills, and cognitive growth. Sunga (2006) focuses the art of questioning that gives a man a chance to know his environment and control environment. Thus, mathematics education is rapidly changing due to the influence of teaching and assessment standards testing programs, technology, and research (Inching, 2006).

It is in the light of this recent world technology that mathematics skills in the intermediate level should be scrutinized and analyzed for the demands of the present time. Likewise, grade six graduates have to prepare for junior high school, the grade seven level of K to 12 curriculum. Mathematics teachers have to find the

different approaches or strategies that will make their students think for themselves and independent (Coronel, 2006).

The teaching of mathematics and poor results of grade six pupils of Tandag District in the tests conducted in the regional as well as in national level has been given focus by this study to give opportunities to experience the challenges offered and the satisfaction gained by confronting open-ended mathematical questions. Thus, this study examines the implementation of mathematical investigative approach among intermediate teachers in Tanday District.

THORITICAL/CONCEPTUAL FRAMEWORK

The present trend in teaching mathematics is in the direction of more structure with better organization of manipulative technique and better way of implementing this is to investigate progressive enlargements of number systems and that there is also trend towards using the relations between the shapes and forms of complex numbers as a powerful tool in mathematics that is a tool for effective citizenship and personal living. It is for the functioning of scientific world. Man at present lives in an age of technology, an age

of products of efforts in the sciences and applied professions. Many of these professionals depend on mathematics for their development and progress (Hillman & Alexanderson, 2003).

The concept of this study presented the professional preparation of the teacher in terms of educational attainment, length of service and mathematics-related trainings as independent variables, dependent variables include investigative approach as to: stages in an investigation, using investigation in the classroom, classroom discussion of investigative thinking, and using computer in an investigation. The result of this study is a benchmark of enriched mathematics instruction.

RESEARCH DESIGN AND METHODS

The study utilized the descriptive method of research. The fact-finding research and data gathered were describe and subjected to a test of difference in the implementation of mathematical investigation approach and its implementation of seventy-nine (79) intermediate teachers in Tandag District.

RESULTS AND DISCUSSIONS

Table 1
Profile of the Respondents

Teachers' Profile in terms of:	Frequency	Percentage (%)	Rank
A) Educational Attainment			
Bachelor of Secondary Education (BSED)	9	11.4%	4 th
Bachelor of Elementary Education (BEEEd)	20	25.3%	2 nd
With units in Master's Study	37	46.8%	2 st
Complete Academic Records (CAR) in Master's Study	10	12.7%	3 rd
Master's Degree	2	2.5%	5 th
Complete Academic Records (CAR) in Ph.D./Ed.D.	0	0%	7.5 th
Ph.D. Degree	0	0%	7.5 th
Ed.D. Degree	1	1.3%	6 th
B) Length of Service (Teaching Experience)			
5 years & Below	15	19%	3 rd
6-10 years	21	26.6%	1 st
11-15 years	15	19%	3 rd
16-20 years	13	16.4%	5 th
21 years and above	15	19%	3 rd
C) Number of Related Training			
Local	98	88.3%	1 st
Regional	10	9%	2 nd
National	3	2.7%	3 rd

The data indicates that on educational attainment; most of the teachers have earned M.A. units which comprised 37 or 46.8%. It is followed by BEEEd graduates comprising 20 or 25.3%. Those who completed academic requirements were 9 or 11.4%, M.A. degree holders were 2 or 2.5% and only 1 or 1.3% is a graduate of Ed.D degree. Results imply that teachers do not pursue further studies to upgrade their profession. This can be due to lack of funds for this purpose; slow promotion given to teachers such as upgrading their salary, raise in rank and lack of items to move them up to higher position. Considering that the majority are BEEEd, this can be interpreted

that there is a lack of knowledge and skills on the part of the teachers such as to the importance of an effective math teaching to students. Spring (2006) stated that an effective math teaching is related to proficient teaching. Since only 2 out of 79 teachers are master's degree holders it can be concluded that there is lack of encouragement and incentives extended by the administrators for the privileges and benefits of mathematics teachers.

On the length of service in teaching the highest number of teachers clustered on 6-10 years of teaching experience with a total of 21 teachers or 26.6%. The lowest number of 13 teachers clustered on the range

of 16-20 years of experience or 16.4%. The fact that the greatest numbers of teachers are grouped on the longest years, it implied that there is slow diminishing of well-trained teachers in Tandag District resulting from early retirement. Since experience makes a good math teacher and that every teacher should know mathematics even if it is not their teaching field the implementation of an effective math instruction should still be learned (Madali, 2007). He further expressed that math implementation should related to good math teaching.

As to math related-trainings attended data gathered show 98 (88.3%) teachers have local training attended which is the highest number of attendance. The lowest number is presented represented by 3 (2.7%) who have attended the national trainings. It implied that majority trainings conducted and on the national and district levels. The fact majority are exposed to local or school

level training. It may be persuade that there is a limited exposure of teachers to shop with ideas from higher level.

The limited experienced teacher in the regional and national level may off-set teachers' failure to obtain higher level trainings on math can still be effectively implements if those who have long-years experience will share their expertise to those with limited knowledge and experience. This is depending on how will the school administrators and math coordinator implement. The quality of in-service professional development of the math teachers as well as the pre-service education may make a difference in the implementation of the schools, districts, and division wide. Thus, the in-service math trainings of math teachers matters a lot in the development of teachers' math proficiency.

Table 2
Extent of Implementation of the Investigative Approach in Mathematics Teaching

Investigative Approach	Frequency	Weighted Frequency	Weighted Mean	Verbal Description
Stages in an investigation	79	261	3.31	Moderately Implemented
Using investigation in the classroom	79	252	3.19	Moderately Implemented
Classroom discussion of investigative thinking	79	255	3.23	Moderately Implemented
Using computer in an investigation	79	247	3.13	Moderately Implemented
Degree of seriousness of the problems encountered in the implementation of mathematics investigation	79	238	3.01	Moderately Implemented

The table reflects the perception of respondents on the stages in an

investigation, anchored on the general descriptive rating of moderately

implemented. This implies that as far as stages in mathematics investigation are concerned the implementation along this aspect is very satisfactory. This is an organized fashion, the degree of organization being refined along the way; data gathered may be generalized which appear to apply to all cases under consideration, reorganizing in which investigation may be simplified or made systematic or more general or otherwise improved. There is a development of a deeper understanding of what is being investigated and explaining or justifying. Students are encouraged to explain why the conjecture holds. Students may provide a deductive justification for the generalization. This finding appeared that there is great emphasis that can be attributed to the fact that it is on students' test results where teachers' performance rating is mostly based upon at the end of the school year. Olivares (2007) concluded in his study on the attributes of good teachers as perceived by students that independent learners can be developed through the teachers' positive attitude towards the subject they teach.

The perceptions of the investigation in the classroom registered the weighted mean of 3.19 which is moderately implemented. This finding can be interpreted as very satisfactory. This implies that all aspects associated in using investigation in the classroom are given emphasis. This can be an indicator, teachers are clear about their purposes for using investigations with students; teacher trial which is necessary to gain familiarity with the investigation that permits adequate sensitivity to students' efforts particularly those which are off beat; first investigation which embodies apparent problems for which productive lines of attack are reasonable obvious; duration of

investigation which depends on the ability of the students; mode of presentation which are in written form; provision of material special for investigation; duration of informing students what is expected of them; use of class time which allows students to use sufficient time to get involved and provision of hints.

This is in agreement with the principle which states that students learn when learning task is within their level of understanding.

Classroom discussion of investigative thinking reveals a category of moderately implemented. This is supported by a weighted mean of 3.23 which is equivalent to very satisfactory performance particularized to informal discussion; more formal discussion; identification of processes and strategies and cumulative effects of classroom discussion.

The above performance involved the discussion between the teachers and students about some of the processes and strategies in an investigation; processes used and the order in which they occur; the nature of the processes employed; and clear understanding of identified processes and strategies.

This had been the most difficult task a teacher encountered in classroom discussion. Considering that this is a formal discourse between the teachers and their students; the latter may feel uncomfortable with their learning environment that being subjected in an informal situation.

Using computer in an investigation garnered the weighted mean of 3.13, moderately implemented. Teachers provide copies of computer printouts of data; teachers write a program which may be interactive and which allows students to generate data and teacher exercised care so that computer use is kept in perspective.

This means that emphasis was more on the long life span of the machine that the

students' benefit of it.

Table 3
Significant Relationship between the Profile and Extent of Implementation of the Investigative Approach

	Source of Variation	Degree of Freedom	Mean Square	F-value	Critical Value	Decision	Conclusion
Professional preparation profile of the respondents	Treatment in Between	2	613.365	1.03	3.98	Accept H_0	Not Significant
	Error within	11	596.15				
Investigation approach employed in teaching mathematics	Treatment in Between	5	176.1	80.04	3.33	Reject H_0	Significant
	Error within	10	2.2				

The data indicates that mathematics investigation in terms of professional preparation has a computed f-value of 1.03 which is less than the critical value of 3.98 at 0.05 level of significance set for statistical analysis. It also falls within the acceptance of hypothesis showing insignificant difference; thus, its null hypothesis was not rejected.

It explains that there is no significant difference in the perception of teachers on the implementation of mathematics investigation as to the professional preparation profile of the teachers. It implies that professional preparation doesn't affect so much the performance of teachers in mathematics. It only needs commitment and sincerity to teach students in mathematics.

Using investigation approach in mathematics teaching, it can be seen in Table 3 that a computed f-value of 80.04 exceeded the critical value of 3.33 at 0.05 level of significance set for statistical analysis. It also falls within the rejection showing significant difference, hence, its null hypothesis was rejected. Therefore,

there is a significant difference in the perception of respondents as to the aforementioned variable. It implies that investigation approach has a great influence on the teachers' effectiveness in teaching mathematics in the classroom.

CONCLUSIONS

There is no significant difference in the implementation of mathematical investigation as to professional preparation of teachers in mathematics. Most of the intermediate mathematics teachers have earned M.A. units but the degree is not vertically articulated in the field of mathematics. Implementation of mathematics investigation can be enhanced through the increase of sufficient knowledge and skills of mathematics teachers as the teachers pursue the Continuing Professional Development (CPD).

REFERENCES CITED



- Coronel, S.T. (2006). The revised mathematics syllabus in perspective. Singapore: Curriculum Planning Division. Heads of Department (Mathematics) Seminar
- Hom, E.J. (2013). What is Mathematics? Live Science. Retrieved from <https://www.livescience.com/38936-mathematics.html> on July 10, 2014
- Hillman, B. and Alexanderson, A. (2003). Investigating mathematics teaching: A constructivist enquiry. London: Falmer Press.
- Inchiong, G. (2006). Mathematics syllabus. Singapore: Curriculum Planning & Development Division
- Madali, N. (2007). Constructivism in mathematical education. *Journal for Research in Mathematics Education* 21 (4), 7-18. Longman
- Olivares, T. (2007). Learning mathematics. Issues, theory and classroom practice. London: Cassell.
- Perigrino, P. (2000). Children and arithmetic. In L. Smith (Ed.), *Critical readings on Piaget* (pp. 312-346). London, UK: Routledge.
- Spring (2006). CLOSING THE ACHIEVEMENT GAP Best Practices In Teaching Mathematics Funding provided.* Retrieved from http://www.gram.edu/sacs/qep/chapter%204/4_1EducationAlliance.pdf on June 20, 2012
- Sunga, A. (2006). Department of Education. A Journal Review of Art of Questioning.
- Villame, E. (2005). A teaching style. *Mathematics Teaching*, 143, 4-5