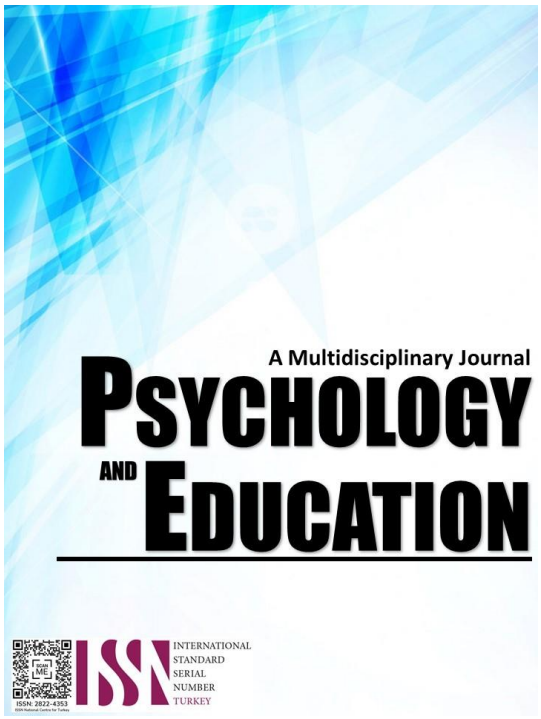
INSTRUCTIONAL COMPETENCIES OF MATHEMATICS TEACHERS AND THEIR PERFORMANCE IN THE EXECUTION OF TASK IN LOPEZ EAST DISTRICT



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Research Article

Instructional Competencies of Mathematics Teachers and Their Performance in the Execution of Task in Lopez East District

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Abstract

This study determined the instructional competencies of Mathematics teachers and their performance in the execution of tasks in Lopez East District. This sought to assess: the instructional competencies of the teachers in Mathematics 6 in terms of: Knowledge of the Subject Matter, Communication Skills, Instructional Practices, Evaluation, Problem Solving, and Professionalism; the significant agreement on the rank orders of the competencies of the teachers, the performance in the execution of tasks along: Teaching-Learning Process, Learners' Outcomes, Community Involvement, and Professional Growth and Development. The study used the descriptive-evaluated-correlational method of research with documentary analysis in describing the effects of instructional competencies and performance of the teachers. Purposive sampling was used as the locale of the study. The statistical tools used were weighted mean, frequency count, percentage, rank order, Kendall Coefficient of Concordance, and its corresponding Chi-square test. The instructional competencies of the teachers were Very Much Evident. There is a significant agreement on the rank orders on the instructional competencies in terms of: Knowledge of Subject Matter, Communication Skills, Instructional Practices, Evaluation, and Professionalism and there is no significant agreement in terms of Problem Solving. The teachers' performance in the execution of tasks was Outstanding. There is a significant agreement on the rank orders of the level of teachers' performance as follows: Teaching Learning-Process; Learners' Outcome; and Personal Growth and Professional Development.

Keywords: *instructional competencies, performance, mathematics teachers, Philippines*

Introduction

Teaching mathematics requires the teacher to give up the role imparter of information and to become the architect, facilitator, manager, counselor, evaluator, and motivator of active learning. It is the skill of the teacher in planning lessons and encouraging pupils thought that determine the success of this approach. Based on the report the young Filipinos today in terms of Mathematics achievement perceived low academic performance. Teachers need more quality instructional skills because poor skills result to poor quality learning. Quality Education is the aim of the present educational system. It is clearly stated in the 1987 Philippine Constitution under the Article XIV, Section 1, which states that "The state shall promote and protect the right of all citizens to quality education at all levels and shall take appropriate steps to make such education accessible to all*".* the result of the Performance in International Assessment and Studies like Trends in Math and Science Study (TIMSS) in year 2003 indicates that our educational system should be improved since the Philippines was raked forty-third (43rd) from the bottom of forty-five (45) participating countries; it got 345 points while Singapore had 604 points for mathematics. The two lower countries were Morocco (337) and South Africa (275). For Science, the same pattern reflected. Hence, it can be concluded that Philippines needs to work-out to get to the top. Corollary to RA 10533, DepEd Memorandum 92, s.2013 was issued in the field. This memorandum is known as "Learning Resources for the Implementation of Enhanced Curriculum under the K to 12 Basic Education Program". The content of this memorandum explicitly expresses to support the implementation of the Enhanced Curriculum in the K to 12 Basic Education Program.

The Schools First Initiative (SFI)of 2004 is an effort to improve basic education outcomes through a broadly participated, popular movement featuring a wide variety of initiatives particularly since DepEd is pursuing a package of policy reforms that seeks to systematically improve critical regulatory, institutional, structural, financial, cultural, physical and informational conditions affecting basic education provision, access and delivery on the ground. Basic Education Sector Reform Agenda (BESRA) is a policy reforms program that issued The National Competency- Based Teacher Standards (NCBTS) Teacher Strengths and Needs Assessment (TSNA) is anchored on the overarching concept of teacher professional development. It is formative as a tool that will encourage teachers in taking personal responsibility for their own growth and professional

advancement. The view in mind is to promote student learning.

The Sustainable Development Goals (SDGs) is our global target for the 2030 Agenda for Sustainable Development Quality Education. It is aimed to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. It is aimed that by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes, and to shows the commitment to nondiscriminatory education outcomes.

The outstanding accomplishments of Lopez Districts in terms of academic performance can be justified in the concluded MTAP competition. Both Districts of Lopez bagged the highest place in the competition and was able to have learners automatically included in the regional level. Lopez East District aims to provide basic educations that are necessary to the learning needs of school children most especially in teaching them to read. As a matter of fact, teachers in the district are truly abreast in the current demands of the K to 12 curriculums to ensure positive learning of the pupils. One of the programs of the schools in the district is regularly implementing School's Learning Action Cells (SLACs) that includes thorough discussions of activities for the improvement of teaching and learning.

The district has been actively participating in various academic and non-academic contests and proved its excellence for winning up to the regional level and even as silver medalist in the International Mathematics and Science Olympiad (IMSO). The result of this study was a great help to the learners and also to the teachers, as facilitators of learning, are encouraged to employ modern methodologies such as using computer-based resources in teaching. The researcher was motivated to assess the instructional competencies of Mathematics teachers and their teaching performance in Lopez East District.

Research Questions

This study determined the instructional competencies of Mathematics teachers and their performance in the execution of tasks in Lopez East District, Specifically, this sought to answer the following questions:

1. What are the instructional competencies of the teachers in Mathematics 6 in terms of:
   1.1. Knowledge of the Subject Matter,
   1.2. Communication Skills,
   1.3. Instructional Practices,
   1.4. Evaluation,
   1.5. Problem Solving, and
   1.6. Professionalism?
2. How significant is the agreement on the rank orders of the competencies of the teachers in Mathematics 6 among the different Zones?
3. To what extent is the performance of the teachers in the execution of their tasks Mathematics 6 along:
   3.1. Teaching-Learning Process,
   3.2. Learners' Outcomes,
   3.3. Community Involvement, and
   3.4. Professional Growth and Development?
4. How significant is the agreement on the rank orders of the teachers' performance in Mathematics 6 among the different Zones?

Literature Review

Instructional Competencies in Mathematics

Mathematics has a logical structure. Every block in this structure is connected to every other by gap-free reasoning, all resting upon a foundation of a few agreed-upon definitions and fundamental propositions. For ages, cultures and societies have recognized the importance of mathematics. Mathematics is a language that helps us describe ideas and relationships drawn from our environment. As the science of patterns, mathematics enables us to make the invisible visible and thereby solve problems that would otherwise be impossible. Mathematics is a tool of science and technology, not only through computational aids, but by enabling scientists to explore concepts with idealized models before trying them in the real world.

Bostic (2011), found out in his study "The Effects Of Teaching Mathematics Through Problem-Solving Contexts On Sixth-Grade Students' Problem-Solving Performance And Representation Use" that intervention participants had better problem-solving performance and representation use between test administrations. Similarly, they also performed better on the measures than their peers in the comparison group. The semblance of both studies was focused on the effects of teaching mathematics on elementary students but differs since the former study focused on problem solving context in mathematics while the latter was on comprehensive and general mathematics.

Loewenberg (2013), claims on her study "Research on Teaching Mathematics: Making Subject Matter Knowledge Part of the Equation" emphasizes the nature and epistemology of mathematics. Just as central as understanding mathematical concepts and

procedures is understanding what it means to learn mathematics, being able to validate one's own answers, having opportunities to engage in mathematical argument, and seeing value in mathematics beyond its utility in familiar everyday settings. She discussed how the substantive and epistemological dimensions of mathematical knowledge go hand in hand in this view of mathematics. Both researches were all about strategies on teaching mathematics but differs since the former study focused only on mathematics as subject matter while the current research emphasized teaching competency and strategy and how it affects students' performance.

Through this study, a link was established among previous research calling for deeper and further competencies among the Grade 6 teachers of Public Elementary Schools of Lopez East District, Division of Quezon. None of the studies that had been reviewed specifically focused on the competence of teachers in teaching Mathematics in Grade 6. From the presentation of the findings of the aforementioned studies, it was found out that all of them enriched the present studies. Most of the studies focused on the teachers' competence. From among the enumerated studies herein (local and international), it was noted that no one had exactly the same as of the present study thus, this is the gap that this study would like to bridge.

Methodology

Research Design

The study used the descriptive-evaluative-correlational method of research with documentary analysis in describing the effects of instructional competencies and performance of the teachers in teaching Mathematics 6 in the public elementary schools in Lopez East District, Division of Quezon.

Sampling Procedure

Purposive sampling was used by the researchers in choosing Lopez East District as the locale of the study, however total enumeration in the choice of the respondents since all teachers and coordinators were respondents.

Participants

There were thirty-one (31) schools in Lopez East District, and they are divided into Four Zones. Zone 1, the Central school composed of five (5) teachers, Zone 2 with eleven (11) schools composed of fourteen (14) teachers, Zone 3 with ten (10) schools composed of eleven (11) teachers, and Zone 4 with nine (9) schools composed of ten (10) teachers, a total of 40 Mathematics teachers in Grade 6.

Instruments of the Study

Preparation of Questionnaire. The questionnaire was used as the main instrument for gathering the needed data for the investigation. The formulation and validation of the instrument undergone the following stages – planning, unity of items, revision, modification, final printing, and administration of questionnaire for a dry run. In the planning stage, the researcher determined the components of the instrument. Table 2 indicates the Table of Specification of the instrument used in the study.

Validation of the Questionnaire. The instrument undergone validation however, it was first shown to her adviser and some school heads, coordinators in Values Education for comments, suggestions, and approvals. Once approved, it was pretested in some schools which are not included in the study. The researcher followed the usual procedure in conducting validation consisting of pre-test and post-test.

The questionnaire consists of two parts: Part 1 consists of the assessment in the teachers' instructional competencies variables in terms of: Knowledge of the subject matter, communication skills, instructional practices, evaluation, problem solving, and professionalism Part 2 consists of the performance of teachers in the execution of their task along: teaching-learning process, learners' outcome, community involvement and professional growth and development.

Procedures

Data Gathering Procedure. The researcher sought permission from the Schools Division Superintendent, Public Schools District Supervisor and school heads of the different elementary schools included in the study to allow her to distribute questionnaires, conduct informal interviews and observations, and additional data for the study at hand. Upon approval, the researcher approaches all teachers and school heads and requested them to answer the questionnaires which was distributed. Likewise, sought their assistance in distributing and retrieving the same questionnaires from the respondents.

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Reliability and Validity of the Instrument

To measure the internal consistency of the instrument, Kuder-Richardson Formula 21 was used. After the questionnaires were retrieved, the reliability was computed using the formula:

$$r = 1 - \frac{M(N-M)}{N(s^2)}$$

where:
r = reliability coefficient
M = mean
N = number of items
S = standard deviation

The significance of the reliability coefficient was tested using the formula (Siegel, 1988):

where: r = the reliability coefficient

n = number of items

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Standard Deviation will be determined by the following formula: **(Hopkins and Stanley, (1981).**

$$S = \frac{\text{Sum of the high sixth Sum of the low sixth}}{\text{Half the number of cases}}$$

Based on the computed result, the reliability coefficient r was 1.07 with standard deviation of 106.01 and with computed significance of reliability coefficient t = 4.94 which was higher than the tabular value of t0.050 = 1.676. Hence, it can be concluded that the questionnaire is reliable in getting the needed information.

Finalization of the Research Instrument

After the dry-run, final copies of the questionnaires were distributed to 31 public elementary schools in Lopez East District, Lopez, Quezon. The questionnaires were personally distributed by the researcher to be sure that the instrument was given to the target respondents. Teacher-respondents were given four (4) days to answer the questions in the research-made instrument without disrupting their classes.

Retrieval of the Questionnaires

After couple of days waiting for the questionnaires to be accomplished by the respondents, these was retrieved one hundred percent from the teachers of the 31 public elementary schools. The needed information was answered accordingly. The researcher was indeed thankful to the respondents because they were very cooperative and patient in answering the instrument.

Study Procedure. In order that the conduct of the study becomes systematic, the researcher designed a time schedule.

Results and Discussion

Table 1. *Summary of the Instructional Competencies of the Teachers in Mathematics 6 in Lopez East District.*

Indicators	Weighted Mean	Average Interpretation	Rank
1. Knowledge Of the Subject Matter	4.83	VME	6
2. Communication Skills	4.86	VME	3
3. Instructional Practices	4.84	VME	4.5
4. Evaluation	4.92	VME	1
5. Problem Solving	4.84	VME	4.5
6. Professionalism	4.91	VME	2
Average	4.86	VME	

Very Much Evident. This was followed by: Professionalism, (4.91); Communication Skills, (4.86); Instructional Practices, (4.84); Problem Solving, (4.84); Knowledge of the Subject Matter, 4.83 were also interpreted as Very Much Evident. The average weighted mean of the instructional competencies of the teachers in Mathematics 6 among four zones was 4.86 interpreted as Very Much Evident.

Table 2. *The Test of Significant Agreement on the Rank Orders of the Instructional Competencies of the Teachers in Mathematics 6 in Lopez East District*

Indicators	*Knowledge of the Subject Matter*	*Communication Skills*	*Instructional Practices*	*Evaluation*	*Problem Solving*	*Professionalism*
Summation of the squared deviation from the mean	835.0	466.5	1235.5	893.0	338.5	1166.5
Numbers of Indicators	10	9	11	10	9	11
Coefficient of Concordance W	0.634	0.487	0.704	0.678	0.353	0.664
Computed X^2	22.82	15.58	28.16	24.40	11.30	26.56
Degree of Freedom	9	8	10	9	8	10
Tabular Value at						
0.05	16. 919	15. 507	18. 310	16. 919	15. 507	18. 310
0.025	19. 023	17. 535	20. 480	19. 023	17. 535	20. 480
0.01	21. 666	20. 090	23. 210	21. 666	20. 090	23. 210
0.005	23. 589	21. 955	25. 190	23. 589	21. 955	25. 190
0.001	27. 877	26. 124	29. 588	27. 877	26. 124	29. 588
Decision on H: o	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
Significance of Agreement	0.01	0.05	0.005	0.005	No Significant	0.005

To determine whether there is a significant agreement on the rank orders of perceive instructional competencies among the different Zone, the Kendall's Coefficient of Concordance W were used, and it was set at 0.05 level of significance. The results indicated that the teachers of the four Zones significantly agreed on the instructional competencies. This implies that the four zones experiencing the same in their field. Showing that there were also lots of competencies that could really help them. Through the efforts and supports of higher officials, other stakeholders and the department as well this provides a wide chances and opportunities for every teacher to grow personally and professionally in their chosen profession.

Table 3. *Summary of the Performance of the Teachers in the Execution of Tasks Mathematics 6*

Indicators	*Weighted Mean*	*Average Interpretation*	*Rank*
1. Teaching Learning Process	4.90	O	1.5
2. Learners' Outcomes	4.83	O	3
3. Community Involvement	4.90	O	1.5
4. Professional Growth and Development	4.78	O	4
Average	4.85	O	

The summary of the performance of the teachers in the execution of tasks Mathematics 6 in Lopez East District along Teaching-Learning Process; Learners' Outcomes; Community Involvement, and Professional Growth and Development. As reflected, the following indicators were ranked as follows: Teaching-Learning Process, (4.90); Community Involvement, (4.90); Learners' Outcomes, (4.83); Professional Growth and Development, (4.78) were all rated Outstanding. The average weighted mean of the teachers in the execution of tasks Mathematics 6 in Lopez East District was 4.85 or Outstanding.

Table 4. *The Significant Agreement on the Level of the Performance of the Teachers in the Execution of Tasks Mathematics 6*

Indicators	*Teaching-Learning Process*	*Learners' Outcomes*	*Community Involvement*	*Professional Growth and Development*
Summation of the squared deviation from the mean	1354.5	886.50	806.5	924.9
Numbers of Indicators	11	10	10	10
Coefficient of Concordance W	0.772	0.673	0.613	0.702
Computed X2	30.88	24.23	22.07	25.27
Degree of Freedom	10	9	9	9
Tabular Value at				
0.05	18.310	16.919	16.919	16.919
0.025	20.480	19.023	19.023	19.023
0.01	23.210	21.666	21.666	21.666
0.005	25.190	23.589	23.589	23.589
0.001	29.588	27.877	27.877	27.877
Decision on H: o	Rejected	Rejected	Rejected	Rejected
Significance of Agreement	0.001	0.005	0.01	0.005

The significant agreement of the level of teachers' performance described were illustrated The Summation of the squared deviation from the mean, Numbers of indicators, Coefficient of Concordance W, Computed X^2, Degree of Freedom, Tabular value at various level of significance agreement, and the decision on the null hypothesis.

The aforementioned findings guided the researcher to reject the null hypothesis on the level of teachers' performance as follows: Teaching Learning-Process; Learners' Outcome; and Personal Growth and Professional Development in favor of the alternative hypothesis.

Gavino (2010) Statistically, revealed the findings of her study that the level of performance of the faculty as perceived by the students was "very satisfactory "and that there was no significant difference on the extent of perception by students on the level performance of faculty members along: Teacher's personality, syllabi preparation, content, teaching methods, classroom management, and learning management. However, on the factors affecting the teaching performance like the school-related factors, teacher-related factors, and community –related factors, it was perceived that the faculty members were moderately affected. Behind the various factors that affects teachers' teaching performance the teacher in the district confidently shows that they were prepared and ready to deal with different challenges in providing quality education. The indicators aforementioned in the table evidently revealed the actions taken or given of each teacher to perform very well and contribute to the extent of their duty for leaners welfare and for their future.

Conclusion

The following are the conclusions of the study are drawn: (1) The instructional competencies of the teachers in Mathematics 6 was 4.86 interpreted as Very Much Evident. (2) There is a significant agreement on the rank orders on the instructional competencies in terms of: Knowledge of Subject Matter, Communication Skills, Instructional Practices, Evaluation, and Professionalism and there is no significant agreement in terms of Problem Solving. (3) The teachers' performance in the execution of tasks in teaching Mathematics 6 was 4.85 or Outstanding. (4)There is a significant agreement on the rank orders of the level of teachers' performance as follows: Teaching Learning-Process; Learners' Outcome; and Personal Growth and Professional Development. (5) Policy recommendations are formulated to improve instructional competencies and teachers' performance in teaching Mathematics 6.

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