

Exploring the Mathematics Comprehension of Grade IV Pupils in Rizal District, Kalinga: Instruction, Motivation, and Challenges

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Abstract

This study explored the mathematics comprehension of Grade IV pupils in Rizal District, Kalinga, with emphasis on instructional practices, student motivation, and challenges encountered in teaching and learning Mathematics. It used a descriptive-survey design involving 20 Grade IV teacher-respondents from selected public elementary schools. Data were gathered through a structured questionnaire, unstructured interviews, and documentary analysis, and were analyzed using frequency count, percentage, and weighted mean. Results showed that most teacher-respondents were young, female, married, and Bachelor of Elementary Education graduates. Instructional materials were rated moderately adequate, while teaching methods, evaluative techniques, and motivational practices were used very often. Discovery method, experimentation, collaborative learning, board computation, project outputs, and teacher-given points were the leading practices. The most serious problems were weak understanding of problems, weak reasoning skills, lack of knowledge of fundamental operations, and lack of interest. The study concludes that mathematics comprehension is shaped by instructional materials, learner-centered strategies, assessment practices, motivation, and timely remediation. It recommends strengthening instructional resources, using varied teaching approaches, and providing focused support to improve pupils' mathematical understanding and confidence.

Keywords: Mathematics Comprehension, Instructional Materials, Teaching Strategies, Mathematics Motivation

1. Introduction

Mathematics comprehension is a basic learning concern because it affects how pupils make sense of numbers, interpret word problems, choose operations, explain solutions, and apply ideas in everyday life. In the intermediate grades, pupils are expected to move beyond memorized procedures and begin showing clearer reasoning, representation, and problem-solving ability. Recent international assessments continue to emphasize the importance of strong foundational numeracy. PISA 2022, for instance, placed mathematics at the center of global learning recovery discussions and showed that many learners still struggle with mathematical reasoning and application (OECD, 2023).

The concern is also felt in the Philippines, where schools continue to strengthen literacy and numeracy recovery after learning disruptions. The global learning poverty update reported that children in many systems lost important opportunities to develop foundational skills, making focused support in reading and mathematics more urgent (World Bank et al., 2022). In response to these learning needs, the MATATAG curriculum gives renewed attention to essential competencies, decongested learning standards, and the application of mathematical ideas in meaningful situations (Department of Education, 2023). These reforms make Grade IV Mathematics a key stage for strengthening pupils' comprehension before they encounter more abstract topics in the higher grades.

Mathematics comprehension is not shaped by content alone. It is also influenced by the materials used in class, the strategies employed by teachers, the type of evaluation given to pupils, and the motivation that keeps learners engaged. Research on elementary mathematics points to the value of clear representations, purposeful classroom discussion, and timely feedback in improving learning (Education Endowment Foundation, 2021). The National Council of Teachers of Mathematics (2020) similarly emphasizes that pupils should be supported to reason, communicate, represent ideas, and connect mathematics to real situations.

Learners' feelings toward Mathematics also matter. A meta-analysis by Barroso et al. (2021) showed a negative relationship between mathematics anxiety and mathematics achievement. Chen, Jamaludin, and Tan (2023) further observed that anxiety-related behaviors may appear among elementary pupils who are already experiencing difficulty in mathematics tasks. These findings are important because pupils who repeatedly fail to understand word problems or fundamental operations may lose confidence and interest unless teachers provide patient, concrete, and motivating support.

In Rizal District, Kalinga, Grade IV teachers handle pupils with different levels of readiness, interest, home support, and exposure to learning resources. Some pupils can compute but still struggle to understand the problem, explain their reasoning, or choose the correct operation. For this reason, this study explored the mathematics comprehension of Grade IV pupils through the teachers' reports on instructional materials, methods and strategies, evaluative techniques, motivation, and problems encountered. The findings may help teachers and school heads identify practical ways to strengthen classroom instruction and improve pupils' performance in Mathematics.

2. Material and methods

2.1 Research Design

This study employed the descriptive-survey research design to explore the mathematics comprehension of Grade IV pupils in Rizal District, Kalinga, with emphasis on instruction, motivation, and challenges. The descriptive-survey method was used to describe the profile of teacher-respondents and the existing conditions in Grade IV Mathematics instruction.

The same design was used to determine the adequacy of instructional materials, the frequency of use of teaching methods and strategies, the evaluative techniques employed by teachers, the extent of pupils' motivation in studying Mathematics, and the seriousness of the problems encountered in the teaching-learning process.

2.2 Locale of the Study

The study was conducted in selected public elementary schools in Rizal District, Kalinga. The locale was selected because Grade IV teachers in the district directly handle Mathematics instruction and can provide information on instructional materials, teaching strategies, evaluative measures, pupil motivation, and learning difficulties.

2.3 Respondents of the Study

The respondents of the study consisted of 20 Grade IV teachers from selected public elementary schools in Rizal District, Kalinga. They were selected because they were directly involved in teaching Mathematics and were able to provide information on instructional materials, teaching strategies, evaluative measures, pupil motivation, and learning difficulties.

2.4 Sample and Sampling Procedure

The study used random sampling to give eligible Grade IV teachers an equal chance of being selected. This helped provide a fair representation of teachers involved in Mathematics instruction in the district.

2.5 Research Instrument

Data were gathered using a structured survey questionnaire supported by unstructured interviews and documentary analysis. The questionnaire served as the main instrument for collecting information on the respondents' profile, instructional materials, methods and strategies, evaluative techniques, pupils' motivation, and problems encountered.

The questionnaire consisted of six parts. Part I covered the profile of the teacher-respondents. Part II dealt with instructional materials. Part III focused on teaching methods, techniques, and strategies. Part IV assessed evaluative techniques. Part V determined pupils' motivation in studying Mathematics. Part VI identified the seriousness of problems encountered in the teaching-learning process.

The respondents rated the items using a five-point Likert scale. The responses were converted into weighted mean scores to determine the level, frequency, adequacy, or seriousness of each area assessed. The questionnaire was tried out among selected Mathematics teachers who were not included in the final group of respondents, and their comments were used to improve the instrument.

2.6 Data Gathering Procedure

Permission was secured from the concerned school authorities before the data gathering. The researcher distributed the questionnaires to the respondents and retrieved the accomplished forms personally to ensure complete data collection. Unstructured interviews were conducted to clarify and enrich the responses.

2.7 Data Analysis Techniques

Frequency counts and percentages were used to describe the profile of the teacher-respondents. Weighted mean was used to determine the adequacy of instructional materials, the frequency of use of teaching methods and strategies, the frequency of use of evaluative techniques, the extent of pupils' motivation, and the seriousness of problems encountered.

2.8 Ethical Considerations

The study observed ethical procedures in the collection and treatment of data. Permission was secured from the concerned school authorities before data gathering, and participation of the teacher-respondents was treated with respect. Responses were kept confidential, reported in summary form, and used only for academic purposes.

3. Results and Discussion

3.1 Profile of the Teacher-Respondents

Table 1. *Distribution of Respondents as to Age*

Age	Frequency	Percentage
20-25	4	20.00
26-30	9	45.00
31-35	5	25.00
36-40	2	10.00
Total	20	100.00

Table 1 shows that the largest group of respondents was aged 26-30, with 9 teachers or 45.00 percent. This was followed by those aged 31-35 with 5 teachers or 25.00 percent, those aged 20-25 with 4 teachers or 20.00 percent, and those aged 36-40 with 2 teachers or 10.00 percent. The data indicate that most Grade IV Mathematics teachers were relatively young, which may help them adjust to new instructional practices and classroom innovations.

Table 2. *Distribution of Respondents as to Gender*

Gender	Frequency	Percentage
Male	3	15.00
Female	17	85.00
Total	20	100.00

Table 2 presents that female teachers made up the majority of the respondents, with 17 teachers or 85.00 percent. Male teachers accounted for 3 respondents or 15.00 percent. This shows that Grade IV Mathematics instruction in the respondent schools was handled mostly by female teachers.

Table 3. *Distribution of Respondents as to Civil Status*

Civil Status	Frequency	Percentage
Single	6	30.00
Married	14	70.00
Total	20	100.00

Table 3 shows that 14 respondents or 70.00 percent were married, while 6 respondents or 30.00 percent were single. The data indicate that married teachers comprised the larger share of the respondents.

Table 4. *Distribution of Respondents as to Highest Educational Attainment*

Highest Educational Attainment	Frequency	Percentage
Bachelor of Elementary Education	14	70.00
Master's degree	6	30.00
Total	20	100.00

Table 4 shows that 14 teachers or 70.00 percent were Bachelor of Elementary Education graduates, while 6 teachers or 30.00 percent had earned a master's degree. This means that all respondents had formal preparation for elementary teaching, although only some had completed graduate-level studies.

Table 5. *Distribution of Respondents as to Length of Mathematics Teaching Experience*

Length of Experience	Frequency	Percentage
1-5 years	6	30.00
6-10 years	5	25.00
11-15 years	9	45.00
Total	20	100.00

Table 5 reveals that 9 respondents or 45.00 percent had been teaching Mathematics for 11-15 years. Six teachers or 30.00 percent had 1-5 years of experience, while 5 teachers or 25.00 percent had 6-10 years of experience. The data show that

the respondents had varied exposure to Mathematics instruction, with the largest group already having more than a decade of experience.

Table 6. *Frequency Distribution of Respondents as to Trainings and Seminars Attended Related to Mathematics*

Level of Training/Seminar	Frequency
School	20
District	20
Division	20
Regional	15
National	10
International	4

Table 6 shows that all 20 respondents attended school, district, and division-level Mathematics-related seminars and trainings. Fifteen attended regional training, 10 attended national training, and 4 attended international training. This means that the teachers had continuing exposure to professional development, although participation declined as the level of training became higher. Such professional development is important because current mathematics reforms call for teachers who can use representations, feedback, discussion, and reasoning-oriented tasks effectively (Education Endowment Foundation, 2021; National Council of Teachers of Mathematics, 2020).

3.2 Adequacy of Instructional Materials in Grade IV Mathematics

Table 7. *Instructional Materials in Studying Grade IV Mathematics*

Instructional Materials	Weighted Mean	Qualitative Description	Rank
Text Books	2.66	Moderately Adequate	8
Workbooks	2.34	Slightly Adequate	10
Graphing board	2.37	Slightly Adequate	9
Graphing Papers	4.23	Extremely Adequate	1
Handouts	3.25	Moderately Adequate	3
Scales	3.12	Moderately Adequate	6
Geometric Figures	3.37	Moderately Adequate	2
Measuring materials	2.86	Moderately Adequate	7
Charts	3.28	Moderately Adequate	4
Pictures	3.35	Moderately Adequate	3
Average Weighted Mean	3.08	Moderately Adequate	

Table 7 shows a category mean of 3.08, described as Moderately Adequate. Graphing papers received the highest weighted mean of 4.23 and were described as Extremely Adequate. This was followed by geometric figures ($M = 3.37$), pictures ($M = 3.35$), charts ($M = 3.28$), handouts ($M = 3.25$), scales ($M = 3.12$), measuring materials ($M = 2.86$), textbooks ($M = 2.66$), graphing boards ($M = 2.37$), and workbooks ($M = 2.34$). The weighted mean suggests that while some visual and concrete materials were available, more structured learning resources such as workbooks and textbooks remained limited. This finding is meaningful because representations, manipulatives, and well-selected materials help pupils connect abstract ideas with concrete experiences and support mathematical reasoning (Education Endowment Foundation, 2021; National Council of Teachers of Mathematics, 2020).

3.3 Methods, Techniques, and Strategies in Teaching Grade IV Mathematics

Table 8. *Methods, Techniques, and Strategies in Teaching Grade IV Mathematics*

Method/Technique/Strategy	Weighted Mean	Qualitative Description	Rank
Inductive Method	3.42	Often	6
Deductive Method	2.37	Slightly Often	10
Experimentation	4.26	Extremely Often	2
Project Method	3.10	Moderately Often	8
Discovery Method	4.28	Extremely Often	1
Problem Solving	3.55	Very Often	4
Team Teaching	3.26	Moderately Often	7
Collaborative Learning	4.06	Very Often	3

Method/Technique/Strategy	Weighted Mean	Qualitative Description	Rank
Concept Learning Approach	3.45	Very Often	5
Demonstration	3.07	Moderately Often	9
Average Weighted Mean	3.48	Very Often	

Table 8 presents a category mean of 3.48, described as Very Often. Discovery method obtained the highest weighted mean of 4.28 and was described as Extremely Often. It was followed by experimentation ($M = 4.26$), collaborative learning ($M = 4.06$), problem solving ($M = 3.55$), concept learning approach ($M = 3.45$), inductive method ($M = 3.42$), team teaching ($M = 3.26$), project method ($M = 3.10$), demonstration ($M = 3.07$), and deductive method ($M = 2.37$). The weighted mean shows that teachers used active and learner-centered approaches more frequently than purely teacher-directed approaches. This supports recent recommendations that pupils learn Mathematics better when they are given opportunities to investigate, discuss, explain, and apply mathematical ideas rather than merely memorize rules (NCTM, 2020; OECD, 2023).

3.4 Evaluative Techniques Used by Mathematics Teachers

Table 9. *Evaluative Techniques of Mathematics Teachers*

Evaluative Technique	Weighted Mean	Qualitative Description	Rank
Recitation/oral tests	3.83	Very Often	3
Board computation	4.41	Extremely Often	1
Written tests on problem solving	3.43	Moderately Often	6
Check-up assignment	3.45	Very Often	5
Group dynamics	3.67	Very Often	4
Project outputs	4.21	Very Often	2
Exercises/Quiz	2.51	Slightly Often	7
Average Weighted Mean	3.64	Very Often	

Table 9 shows a category mean of 3.64, described as Very Often. Board computation ranked first with a weighted mean of 4.41 and was described as Extremely Often. Project outputs followed with 4.21, then recitation/oral tests with 3.83, group dynamics with 3.67, check-up assignment with 3.45, written tests on problem solving with 3.43, and exercises/quiz with 2.51. The weighted mean indicates that teachers used a range of evaluative techniques, with emphasis on visible problem solving and performance-based outputs. Frequent assessment can be helpful when it provides feedback and reveals misconceptions, but it should remain supportive so that pupils do not associate Mathematics only with pressure or failure (Barroso et al., 2021; Education Endowment Foundation, 2021).

3.5 Motivation for Studying Grade IV Mathematics

Table 10. *Motivations of Mathematics Teachers*

Motivation	Weighted Mean	Qualitative Description	Rank
Additional points from teachers will be received	4.51	Extremely Often	1
Relating math problems to real life is possible	4.20	Often	2
Learn lessons/morals for a certain problem solving	4.04	Very Often	3
Level of knowledge in computation will increase in a certain area	3.47	Very Often	4
There are activities that make us learn purposely	3.37	Moderately Often	5
Parents' rewards are attractive especially in attaining high grades	3.35	Moderately Often	6
For personal enjoyment and learning	3.21	Moderately Often	7
Increases the level of thinking for mathematical analysis	3.08	Moderately Often	8
Additional allowances for high scores are given by parents	3.05	Moderately Often	9
Solving problems is just for not being alone	3.01	Moderately Often	10
Average Weighted Mean	3.53	Very Often	

Table 10 reveals a category mean of 3.53, described as Very Often. The leading motivation was receiving additional points from teachers, with a weighted mean of 4.51. This was followed by relating math problems to real life ($M = 4.20$), learning lessons from problem solving ($M = 4.04$), increasing knowledge in computation ($M = 3.47$), purposeful learning activities ($M = 3.37$), parents' rewards for high grades ($M = 3.35$), personal enjoyment and learning ($M = 3.21$), increased thinking for mathematical analysis ($M = 3.08$), additional allowances for high scores ($M = 3.05$), and solving problems to avoid being alone ($M = 3.01$). The weighted mean shows that both extrinsic rewards and meaningful applications helped motivate

pupils. Connecting mathematics to real-life situations is especially important because it allows pupils to see Mathematics as useful, not merely as a school requirement (OECD, 2023; National Council of Teachers of Mathematics, 2020).

3.6 Problems Encountered in Learning Mathematics

Table 11. *Problems Encountered in Grade IV Mathematics*

Problem Encountered	Weighted Mean	Qualitative Description	Rank
Weak understanding of the problem	4.18	Very Serious	1
Weak sense of reasoning/inferences	4.15	Very Serious	2
Lack of knowledge of the fundamental operations	4.08	Very Serious	3
Lack of interest	3.72	Very Serious	4
Absenteeism due to family problems	3.15	Moderately Serious	5
Poverty	3.12	Moderately Serious	6
Fear of numbers	3.06	Moderately Serious	7
Health problems	2.84	Moderately Serious	8
Insufficiency of allowance	2.71	Moderately Serious	9
Inadequate instructional materials	2.48	Slightly Serious	10
Big classes	2.46	Slightly Serious	11
Carelessness in the process of answering	2.44	Slightly Serious	12
Poor administrator-teacher-student relationship	1.76	Not Serious	13
Average Weighted Mean	3.09	Moderately Serious	

Table 11 shows a category mean of 3.09, described as Moderately Serious. The most serious problem was weak understanding of the problem, with a weighted mean of 4.18. It was followed by weak sense of reasoning/inferences ($M = 4.15$), lack of knowledge of fundamental operations ($M = 4.08$), lack of interest ($M = 3.72$), absenteeism due to family problems ($M = 3.15$), poverty ($M = 3.12$), fear of numbers ($M = 3.06$), health problems ($M = 2.84$), insufficiency of allowance ($M = 2.71$), inadequate instructional materials ($M = 2.48$), big classes ($M = 2.46$), carelessness in answering ($M = 2.44$), and poor administrator-teacher-student relationship ($M = 1.76$). The weighted mean points to comprehension and reasoning as the central concerns. Recent research explains that repeated difficulty in understanding mathematical tasks can lower confidence and contribute to mathematics anxiety, which may then weaken performance further (Barroso et al., 2021; Chen et al., 2023).

4. Conclusion & Recommendations

The findings show that the mathematics comprehension of Grade IV pupils in Rizal District, Kalinga is influenced by instructional materials, teaching methods, evaluative techniques, motivation, and the learning difficulties encountered in Mathematics instruction. The teacher-respondents were mostly young, female, married, and Bachelor of Elementary Education graduates, with varied teaching experience and exposure to professional development activities. Instructional materials were only moderately adequate. Graphing papers, geometric figures, and pictures were more available, while workbooks, graphing boards, and textbooks were less sufficient. Teachers used methods, techniques, and strategies very often, particularly discovery method, experimentation, and collaborative learning. They also used evaluative techniques very often, especially board computation, project outputs, and recitation/oral tests. Motivation was also evident, with additional points, real-life application of Mathematics problems, and lessons from problem solving serving as the leading motivators. Despite these positive practices, pupils continued to experience moderately serious problems, especially weak understanding of problems, weak reasoning or inference skills, lack of knowledge of fundamental operations, and lack of interest. These difficulties show that pupils need more structured support in understanding the meaning of problems, identifying relevant information, selecting operations, explaining steps, and checking answers. The study concludes that improving mathematics comprehension requires adequate instructional materials, learner-centered teaching strategies, supportive assessment, meaningful motivation, and focused remediation. Teachers may strengthen comprehension by combining concrete materials, guided problem analysis, peer discussion, real-life tasks, and regular feedback. School administrators may support this by improving access to workbooks, textbooks, graphing boards, and other resources, and by providing training that helps teachers address pupils' reasoning and problem-solving difficulties.

Based on the findings, it is recommended that Rizal District strengthen Grade IV Mathematics instruction by improving access to workbooks, textbooks, graphing boards, and other concrete learning materials. Teachers may continue using discovery method, experimentation, collaborative learning, board computation, project outputs, and real-life problem tasks while giving more focused remediation on word-problem comprehension, reasoning, fundamental operations, and learner

interest. School heads may also provide training on guided problem analysis, feedback, and learner-centered assessment to help pupils build mathematical confidence.

The study was limited to 20 Grade IV teachers from selected public elementary schools in Rizal District, Kalinga. Since the data were gathered through teacher responses, unstructured interviews, and documentary analysis and were treated mainly through descriptive statistics, the findings may not fully capture the direct experiences of pupils, parents, or school heads. The results should therefore be interpreted within the specific locale, respondents, instrument, and period covered by the study.

Compliance with ethical standards

The study adhered to institutional ethical standards in the conduct of educational research. Permission from the concerned school authorities was secured before data gathering, and the participation of the teacher-respondents was treated with respect. Responses were kept confidential, reported in summary form, and used only for academic purposes. The authors take responsibility for the integrity of the manuscript, acknowledge all sources and contributions used in the study, retain responsibility for copyright matters, and declare that no conflict of interest was involved in the preparation of this work.

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