

## Effects of Conceptual and Procedural Pedagogical Approaches of Teachers on the Mathematical Performance of Grade 7 Students

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Publication history: Received: June 25, 2026; Revised: July 18, 2026; Accepted: July 22, 2026

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### Abstract

This study determined the effects of teachers' conceptual and procedural pedagogical approaches on the mathematical performance of Grade 7 students in selected private secondary schools in the Municipality of Morong, Province of Rizal, during the School Year 2025–2026. Specifically, it examined the extent to which these pedagogical approaches influenced students' conceptual understanding, mathematical reasoning, problem-solving ability, and classroom engagement, as well as their relationship with mathematical performance. The study employed a descriptive survey research design complemented by documentary analysis. A researcher-made questionnaire-checklist was administered to 125 Grade 7 students selected through convenience sampling from five private secondary schools, namely Jesus My Shepherd Montessori School, Renaissance School of Science and Technology, St. Jerome's Academy, St. John Hill Academy, and Tomas Claudio Colleges. Documentary analysis of students' third-quarter Mathematics grades was conducted to determine their level of mathematical performance. Findings revealed that most respondents were female, aged 12–13 years old, with parents who were college graduates, employed in government service, and belonging to families with a monthly income of ₱40,000 and above. Teachers' conceptual and procedural pedagogical approaches were perceived to have a high effect on students' mathematical reasoning, problem-solving ability, and classroom engagement. No significant differences were found in students' perceptions of these pedagogical approaches across most profile variables; however, age and fathers' educational attainment significantly influenced problem-solving ability. The majority of students achieved outstanding mathematical performance during the third quarter. Furthermore, significant positive relationships were found between teachers' pedagogical approaches and students' mathematical performance in terms of conceptual understanding, mathematical reasoning, and classroom engagement, while no significant relationship was established with problem-solving ability. The study concluded that conceptual and procedural pedagogical approaches contribute significantly to students' mathematical performance and that age and fathers' educational attainment influence problem-solving ability. It is recommended that schools strengthen mathematics enrichment programs, enhance instructional support, provide continuous teacher professional development, encourage greater parental involvement, and implement the proposed action plan to further improve students' mathematical performance.

**Keywords:** Conceptual Pedagogy, Procedural Pedagogy, Mathematical Performance, Conceptual Understanding, Mathematical Reasoning, Problem-Solving Ability, Classroom Engagement, Grade 7 Students

### 1. Introduction

Mathematics plays a vital role in developing learners' logical reasoning, analytical thinking, creativity, and problem-solving skills, making it one of the core disciplines in basic education. As educational systems continue to emphasize 21st-century competencies, mathematics instruction has shifted from merely teaching computational procedures toward promoting conceptual understanding, critical thinking, and meaningful application of knowledge. This transformation recognizes that effective mathematics learning occurs when students understand not only how mathematical procedures are performed but also why they work and when they should be applied. Consequently, teachers are encouraged to employ pedagogical approaches that integrate conceptual and procedural learning to foster deeper mathematical understanding and improve academic performance.

Conceptual pedagogical approaches focus on helping learners construct mathematical meaning by connecting new concepts with prior knowledge, encouraging reasoning, explanation, and the exploration of relationships among mathematical ideas. Procedural pedagogical approaches, on the other hand, emphasize mastery of algorithms, computational fluency, and systematic application of mathematical processes. Contemporary mathematics education suggests that these two approaches are complementary rather than competing, as conceptual understanding strengthens procedural fluency while procedural competence reinforces conceptual learning. The balanced integration of these pedagogical approaches enables learners to develop flexible mathematical thinking and greater confidence in solving mathematical problems.

Recent studies have consistently highlighted the importance of conceptual pedagogy in improving mathematics learning. Lalisán and Cajandig (2024) demonstrated that the use of a game-based conceptual approach significantly enhanced Grade

7 students' conceptual understanding of mathematics by promoting active participation and meaningful engagement in classroom learning. Their findings emphasized that instructional strategies centered on conceptual learning improve students' comprehension beyond memorization of formulas and procedures. Likewise, Manurung and Manurung (2024) reported that the Conceptual Understanding Procedures (CUPs) learning model significantly improved students' mathematical conceptual understanding through structured learning experiences that combined conceptual exploration with guided procedural practice.

Similarly, Gunawan and Hadi (2024) found that the Realistic Mathematics Education (RME) approach significantly improved students' conceptual understanding and procedural understanding while strengthening mathematical reasoning abilities. Their study demonstrated that students exposed to contextualized mathematical instruction performed better than those taught through conventional lecture methods, indicating that meaningful learning experiences facilitate both conceptual mastery and procedural competence. Furthermore, Balacuit et al. (2025) established that students' conceptual understanding was positively associated with their engagement in mathematics, suggesting that learners who possess stronger conceptual knowledge exhibit higher levels of cognitive, emotional, behavioral, and social engagement during mathematics instruction.

Beyond conceptual learning, current literature emphasizes the continuing importance of procedural pedagogy in developing mathematical proficiency. Progressivism-based instructional approaches encourage inquiry, collaboration, and student-centered learning while maintaining opportunities for procedural practice to strengthen computational fluency and mathematical confidence. Recent reviews suggest that effective mathematics instruction should not prioritize conceptual knowledge at the expense of procedural skills but should intentionally integrate both dimensions to produce balanced mathematical competence. Such integration allows learners to transfer knowledge across different mathematical situations and develop higher-order thinking skills essential for academic success.

Despite these developments, mathematics performance among secondary school students remains a concern in many educational institutions. Differences in students' conceptual understanding, mathematical reasoning, problem-solving ability, and classroom engagement continue to influence academic achievement. While previous studies have examined either conceptual pedagogy or procedural instruction independently, relatively few investigations have explored their combined effects on students' overall mathematical performance within the context of private secondary schools in the Philippines. Moreover, limited local studies have simultaneously examined the relationships among conceptual understanding, mathematical reasoning, problem-solving ability, classroom engagement, and mathematics achievement using documentary analysis of actual academic performance.

Although recent studies published have established the effectiveness of conceptual learning, procedural instruction, realistic mathematics education, and student engagement in improving mathematics learning, most focused on experimental interventions, specific instructional models, or individual learning outcomes. Existing literature has given limited attention to the combined influence of teachers' conceptual and procedural pedagogical approaches on multiple dimensions of students' mathematical learning—namely conceptual understanding, mathematical reasoning, problem-solving ability, classroom engagement, and overall mathematics performance—particularly among Grade 7 students in private secondary schools in the Municipality of Morong, Rizal. Furthermore, few studies have incorporated students' actual academic records through documentary analysis alongside survey data to determine the relationship between pedagogical approaches and mathematics performance. This gap justifies the conduct of the present study, which seeks to provide empirical evidence that may guide mathematics teachers, school administrators, curriculum planners, and educational leaders in strengthening instructional practices that enhance students' mathematical achievement.

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## **2. Material and methods**

### **2.1 Research Design**

The study employed a descriptive survey research design complemented by documentary analysis to determine the effects of teachers' conceptual and procedural pedagogical approaches on the mathematical performance of Grade 7 students in selected private secondary schools in the Municipality of Morong, Rizal, during the School Year 2025–2026.

### **2.2 Locale of the Study**

The study was conducted in five (5) private secondary schools in the Municipality of Morong, Province of Rizal, namely Jesus My Shepherd Montessori School, Renaissance School of Science and Technology, St. Jerome's Academy, St. John Hill Academy, and Tomas Claudio Colleges, which were selected because they offer Grade 7 Mathematics and provided access to the target respondents.

### 2.3 Respondents of the Study

The respondents of the study consisted of one hundred twenty-five (125) Grade 7 students enrolled in the selected private secondary schools during the School Year 2025–2026, who served as the primary sources of information regarding the perceived effects of teachers' conceptual and procedural pedagogical approaches.

### 2.4 Sample and Sampling Procedure

The study utilized convenience sampling, wherein the 125 Grade 7 students who were available and willing to participate during the conduct of the study were selected from the participating private secondary schools.

### 2.5 Research Instrument

The primary data-gathering instrument was a researcher-made questionnaire-checklist consisting of two parts: Part I gathered the respondents' demographic profile, while Part II measured the perceived effects of teachers' conceptual and procedural pedagogical approaches in terms of conceptual understanding, mathematical reasoning, problem-solving ability, and classroom engagement using a five-point Likert scale; documentary analysis of students' third-quarter Mathematics grades was likewise employed to determine their mathematical performance.

### 2.6 Data Gathering Procedure

After securing approval from the school authorities, the researcher administered the validated questionnaire to the respondents, retrieved the accomplished instruments, and collected the students' third-quarter Mathematics grades through documentary analysis while observing ethical standards, confidentiality, and voluntary participation throughout the data collection process.

### 2.7 Data Analysis Techniques

The collected data were analyzed using frequency and percentage for the respondents' profile, weighted mean and standard deviation to determine the extent of the effects of teachers' conceptual and procedural pedagogical approaches, t-test and one-way analysis of variance (ANOVA) to determine significant differences, Pearson Product-Moment Correlation Coefficient (Pearson  $r$ ) to determine significant relationships, and documentary analysis to describe the level of students' mathematical performance, with all hypotheses tested at the 0.05 level of significance.

### 2.8 Ethical Considerations

The study adhered to established ethical principles throughout the research process. Prior to data collection, permission was obtained from the concerned authorities. All respondents were informed of the purpose, procedures, and voluntary nature of the study, and their informed consent was secured before participation. Confidentiality and anonymity of the respondents were strictly maintained by ensuring that no personal or company-identifiable information was disclosed in the presentation of the results. Participants were assured that they could withdraw from the study at any time without any consequences. The data gathered were used solely for academic and research purposes, stored securely, and handled in accordance with the agreed confidentiality and non-disclosure provisions to protect the privacy and integrity of both the respondents and the participating organizations.

## 3. Results and Discussion

### 3.1 Profile of the Respondents in Terms of the Selected Variables

As shown in this table in terms of age, out of 125 respondents, 74 or 59.2% were 12 years old, while 51 or 40.8% were 13 years old. In terms of sex most of them are female with 56.8%, while male is 43.2%. The female respondents outnumbered the male respondents. As to their sibling position, 45 or 36% are firstborn, 36 or 28.2% are in the middle child, 31 or 24.8% are youngest, while 13 or 10.4% are only child. In terms of the number of children in the family, 60 or 48% have 1-2 children, 51 or 40.8% have 3-4 children, 8 or 6.4% have 5-6 children and the least age 7 and above children in the family with 6 or 4.8%. As to their parents' educational attainment, most of the parents both father and mother, graduated in college with 71.2% and 81.6% respectively, only 4% of both parents are elementary graduate. For parents' occupation, most of the parents both father and mother are government employees with 29.6% and 36% respectively and the rest are self-employed and private employees. For parents' monthly income, 87 out of 125 or 69.6% have earning of Php 40,001 and above, very few have monthly earning of less than Php 40,000 and below.

Table 1  
*Profile of the Respondents in Terms of the Selected Variables*

| Age          | F  | %    | Rank |
|--------------|----|------|------|
| 12           | 74 | 59.2 | 1    |
| 13           | 51 | 40.8 | 2    |
| 14           | -  | -    | -    |
| 15 and above | -  | -    | -    |

|                                  |        |      |      |        |      |      |
|----------------------------------|--------|------|------|--------|------|------|
| Total                            | 125    | 100  |      |        |      |      |
| Sex                              | F      | %    | Rank |        |      |      |
| Male                             | 54     | 43.2 | 2    |        |      |      |
| Female                           | 71     | 56.8 | 1    |        |      |      |
| Total                            | 125    | 100  |      |        |      |      |
| Sibling Position                 | F      | %    | Rank |        |      |      |
| Firstborn                        | 45     | 36.0 | 1    |        |      |      |
| Middle child                     | 36     | 28.8 | 2    |        |      |      |
| Youngest                         | 31     | 24.8 | 3    |        |      |      |
| Only child                       | 13     | 10.4 | 4    |        |      |      |
| Total                            | 125    | 100  |      |        |      |      |
| Number of Children in the Family | F      | %    | Rank |        |      |      |
| 1-2                              | 60     | 48.0 | 1    |        |      |      |
| 3-4                              | 51     | 40.8 | 2    |        |      |      |
| 5-6                              | 8      | 6.4  | 3    |        |      |      |
| 7 and above                      | 6      | 4.8  | 4    |        |      |      |
| Total                            | 125    | 100  |      |        |      |      |
| Parent’s Educational Attainment  | Father |      |      | Mother |      |      |
|                                  | F      | %    | Rank | F      | %    | Rank |
| Elementary Graduate              | 5      | 4.0  | 3    | 4      | 3.2  | 3    |
| High School Graduate             | 31     | 24.8 | 2    | 19     | 15.2 | 2    |
| College graduate                 | 89     | 71.2 | 1    | 102    | 81.6 | 1    |
| Total                            | 125    | 100  |      | 125    | 100  |      |
| Parent’s Occupation              | Father |      |      | Mother |      |      |
|                                  | F      | %    | Rank | F      | %    | Rank |
| Business                         | 30     | 24.0 | 3    | 26     | 20.8 | 2    |
| Government Employee              | 37     | 29.6 | 1    | 45     | 36.0 | 1    |
| Private Employee                 | 32     | 25.6 | 2    | 24     | 19.2 | 3    |
| Self-employed                    | 20     | 16.0 | 4    | 15     | 12.0 | 4.5  |
| Housewife/househusband           | 6      | 4.8  | 5    | 15     | 12.0 | 4.5  |
| Total                            | 125    | 100  |      | 125    | 100  |      |
| Monthly Family Income            | F      |      |      | %      |      | Rank |
| below Php 10,000                 | 5      |      |      | 4.0    |      | 4    |
| Php 10,000 – Php 20,000          | 15     |      |      | 12.0   |      | 3    |
| Php 20,001 – Php 30,000          | 2      |      |      | 1.6    |      | 5    |
| Php 30,001 – Php 40,000          | 16     |      |      | 12.8   |      | 2    |
| Php 40,001 and above             | 87     |      |      | 69.6   |      | 1    |
| Total                            | 125    |      |      | 100    |      |      |

### 3.2 Extent of Effects of Conceptual and Procedural Pedagogical Approaches as Perceived by the Respondents with Respect to the Different Aspects

Table 2 presents the summary of the extent of the effects of teachers' conceptual and procedural pedagogical approaches as perceived by the respondents in terms of conceptual understanding, mathematical reasoning, problem-solving ability, and classroom engagement. The findings revealed an overall composite weighted mean of 4.08, verbally interpreted as Often with High Effect, indicating that the pedagogical approaches employed by teachers have a high positive effect on students' mathematics learning. Among the four aspects, conceptual understanding ranked first with a weighted mean of 4.36, verbally interpreted as Often; followed by mathematical reasoning with a weighted mean of 4.04, verbally interpreted as Often; classroom engagement with a weighted mean of 3.97, verbally interpreted as Often; and problem-solving ability with a weighted mean of 3.93, likewise verbally interpreted as Often. These findings suggest that while teachers effectively promote students' conceptual understanding and mathematical reasoning, greater emphasis should be given to strengthening students' problem-solving ability and sustaining classroom engagement. The findings support the study of Cabuquin and Abocejo (2024), who emphasized that integrating conceptual and procedural pedagogical approaches enables learners to develop deeper mathematical understanding, procedural fluency, and stronger problem-solving skills, thereby improving overall mathematics performance..

Table 2.1

*Extent of Effects of Conceptual and Procedural Pedagogical Approaches as Perceived by the Respondents with Respect to the Different Aspects*

| Aspects                                      | Overall $\bar{W}\bar{X}$ | Verbal Interpretation | Rank |
|----------------------------------------------|--------------------------|-----------------------|------|
| Conceptual Understanding                     | 4.36                     | Often                 | 1    |
| Mathematical Reasoning                       | 4.04                     | Often                 | 2    |
| Problem-Solving Ability                      | 3.93                     | Often                 | 4    |
| Classroom Engagement                         | 3.97                     | Often                 | 3    |
| <b>Composite <math>\bar{W}\bar{X}</math></b> | 4.08                     | Often (High Effect)   |      |

### 3.3 Significant Difference on the Extent of Effects of Conceptual and Procedural Pedagogical Approaches of Teachers as Perceived by the Respondents with Respect to the Different Aspects in Terms of Their Profile

Table 3 presents the results of the F-test on the significant difference in the perceived effects of teachers' conceptual and procedural pedagogical approaches with respect to conceptual understanding, mathematical reasoning, problem-solving ability, and classroom engagement when respondents were grouped according to their profile variables. The findings revealed that age showed a significant difference only in problem-solving ability with an F-value of 2.184 and a p-value of .033, leading to the rejection of the null hypothesis, while conceptual understanding, mathematical reasoning, and classroom engagement were found to be not significant. Likewise, father's educational attainment showed a significant difference only in problem-solving ability with an F-value of 3.513 and a p-value of .033, indicating that students' problem-solving ability varied according to their fathers' educational attainment. In contrast, sex, sibling position, number of children in the family, mother's educational attainment, father's occupation, mother's occupation, and monthly family income all yielded p-values greater than 0.05 across the four aspects; thus, the null hypothesis was accepted, indicating no significant differences. These findings suggest that students' age and fathers' educational attainment may influence the development of problem-solving ability, whereas the other profile variables do not significantly affect the perceived effectiveness of teachers' conceptual and procedural pedagogical approaches. The findings are consistent with the study of Asilao-Ebisa and Lomibao (2024), which reported no significant differences in students' conceptual understanding and procedural fluency across instructional sequences, emphasizing that conceptual and procedural knowledge complement one another and should be integrated to promote meaningful mathematics learning.

Table 3

*Significant Difference on the Extent of Effects of Conceptual and Procedural Pedagogical Approaches of Teachers as Perceived by the Respondents with Respect to the Different Aspects in Terms of Their Profile*

| Aspects/Variables                       | F-value | p-value | Ho       | Verbal Interpretation |
|-----------------------------------------|---------|---------|----------|-----------------------|
| <b>Age</b>                              |         |         |          |                       |
| Conceptual Understanding                | 1.627   | .201    | Accepted | Not Significant       |
| Mathematical Reasoning                  | 1.463   | .236    | Accepted | Not Significant       |
| Problem-Solving Ability                 | 2.184   | .033    | Rejected | Significant           |
| Classroom Engagement                    | 2.184   | .117    | Accepted | Not Significant       |
| <b>Sex</b>                              |         |         |          |                       |
| Conceptual Understanding                | .004    | .952    | Accepted | Not Significant       |
| Mathematical Reasoning                  | 1.367   | .245    | Accepted | Not Significant       |
| Problem-Solving Ability                 | .495    | .483    | Accepted | Not Significant       |
| Classroom Engagement                    | .963    | .331    | Accepted | Not Significant       |
| <b>Sibling Position</b>                 |         |         |          |                       |
| Conceptual Understanding                | .798    | .497    | Accepted | Not Significant       |
| Mathematical Reasoning                  | 1.292   | .280    | Accepted | Not Significant       |
| Problem-Solving Ability                 | .731    | .535    | Accepted | Not Significant       |
| Classroom Engagement                    | .392    | .759    | Accepted | Not Significant       |
| <b>Number of Children in the Family</b> |         |         |          |                       |
| Conceptual Understanding                | 1.956   | .124    | Accepted | Not Significant       |
| Mathematical Reasoning                  | 2.238   | .087    | Accepted | Not Significant       |
| Problem-Solving Ability                 | 1.758   | .159    | Accepted | Not Significant       |
| Classroom Engagement                    | 2.088   | .105    | Accepted | Not Significant       |
| <b>Father's Educational Attainment</b>  |         |         |          |                       |

|                                        |       |      |          |                 |
|----------------------------------------|-------|------|----------|-----------------|
| Conceptual Understanding               | 1.790 | .171 | Accepted | Not Significant |
| Mathematical Reasoning                 | 2.009 | .319 | Accepted | Not Significant |
| Problem-Solving Ability                | 3.513 | .033 | Rejected | Significant     |
| Classroom Engagement                   | 2.955 | .056 | Accepted | Not Significant |
| <b>Mother's Educational Attainment</b> |       |      |          |                 |
| Conceptual Understanding               | 1.627 | .201 | Accepted | Not Significant |
| Mathematical Reasoning                 | 2.973 | .055 | Accepted | Not Significant |
| Problem-Solving Ability                | 1.502 | .227 | Accepted | Not Significant |
| Classroom Engagement                   | 2.241 | .111 | Accepted | Not Significant |
| <b>Father's Occupation</b>             |       |      |          |                 |
| Conceptual Understanding               | 1.196 | .316 | Accepted | Not Significant |
| Mathematical Reasoning                 | 2.355 | .058 | Accepted | Not Significant |
| Problem-Solving Ability                | 1.549 | .193 | Accepted | Not Significant |
| Classroom Engagement                   | .614  | .653 | Accepted | Not Significant |
| <b>Mother's Occupation</b>             |       |      |          |                 |
| Conceptual Understanding               | .574  | .682 | Accepted | Not Significant |
| Mathematical Reasoning                 | 1.306 | .272 | Accepted | Not Significant |
| Problem-Solving Ability                | 1.439 | .225 | Accepted | Not Significant |
| Classroom Engagement                   | .733  | .571 | Accepted | Not Significant |
| <b>Monthly Family Income</b>           |       |      |          |                 |
| Conceptual Understanding               | .366  | .832 | Accepted | Not Significant |
| Mathematical Reasoning                 | .552  | .698 | Accepted | Not Significant |
| Problem-Solving Ability                | 1.149 | .337 | Accepted | Not Significant |
| Classroom Engagement                   | .940  | .443 | Accepted | Not Significant |

### 3.4 Level of Mathematical Performance of Grade 7 Students as Revealed by their Average Grades in the Third Quarter

Table 4 presents the level of mathematical performance of the Grade 7 students as revealed by their average grades in the third quarter. The findings showed that 75 students or 60% attained Outstanding performance with grades of 90 and above, 35 students or 28% achieved Very Satisfactory performance with grades ranging from 85–89, 13 students or 10.4% obtained Satisfactory performance with grades ranging from 80–84, and only 2 students or 1.6% received Fairly Satisfactory performance with grades ranging from 75–79, while no student fell under the Did Not Meet Expectations category. The highest recorded grade was 98, the lowest was 77, with a mean grade of 90.16 and a standard deviation of 4.665, indicating that the respondents generally demonstrated excellent performance in Mathematics during the third quarter. These findings imply that the majority of the Grade 7 students attained a high level of mathematical achievement, suggesting that the instructional practices employed by their teachers effectively supported their learning and academic success. Nevertheless, continuous intervention and differentiated instruction remain essential to assist students with relatively lower performance. The findings support the study of Furner (2024), who emphasized that technology-enhanced and hands-on instructional approaches strengthen conceptual understanding, procedural fluency, and students' confidence, ultimately contributing to improved mathematics performance...

Table 4

*Level of Mathematical Performance of Grade 7 Students as Revealed by their Average Grades in the Third Quarter*

| Grade                 | Descriptors               | Average Grades |            |
|-----------------------|---------------------------|----------------|------------|
|                       |                           | Frequency      | Percentage |
| 90 and above          | Outstanding               | 75             | 60         |
| 85-89                 | Very Satisfactory         | 35             | 28         |
| 80-84                 | Satisfactory              | 13             | 10.4       |
| 75-79                 | Fairly Satisfactory       | 2              | 1.6        |
| 70-74                 | Did Not Meet Expectations | -              | -          |
| <b>Total</b>          |                           | <b>125</b>     | <b>100</b> |
| <b>Highest</b>        |                           | <b>98</b>      |            |
| <b>Lowest</b>         |                           | <b>77</b>      |            |
| <b>Mean</b>           |                           | <b>90.16</b>   |            |
| <b>Std. Deviation</b> |                           | <b>4.665</b>   |            |

### 3.5 Significant Relationship between the Perceived Extent of Effects of Conceptual and Procedural Pedagogical Approaches and the level of Mathematical Performance of Grade 7 Students

Table 5 presents the relationship between the extent of the effects of teachers' conceptual and procedural pedagogical approaches and the mathematical performance of Grade 7 students. The results revealed that conceptual understanding had a significant positive relationship with mathematical performance, with an r-value of .395 and a p-value of .000; mathematical reasoning likewise showed a significant relationship, with an r-value of .384 and a p-value of .000; and classroom engagement also demonstrated a significant relationship, with an r-value of .385 and a p-value of .000. Hence, the null hypothesis was rejected for these three aspects. In contrast, problem-solving ability obtained an r-value of .166 and a p-value of .065, which is greater than the 0.05 level of significance; therefore, the null hypothesis was accepted, indicating no significant relationship with students' mathematical performance. These findings suggest that teachers' conceptual and procedural pedagogical approaches contribute significantly to improving students' conceptual understanding, mathematical reasoning, and classroom engagement, which are associated with better mathematics performance. However, additional instructional strategies may be needed to further strengthen students' problem-solving ability. The findings support the study of Manandhar et al. (2022), which emphasized that integrating conceptual and procedural instruction promotes meaningful mathematical learning, enhances students' understanding of concepts, and improves their ability to apply mathematical knowledge in diverse learning situations.

Table 5

*Significant Relationship between the Perceived Extent of Effects of Conceptual and Procedural Pedagogical Approaches and the level of Mathematical Performance of Grade 7 Students*

|                          | r-values | p-value | Ho       | VI              |
|--------------------------|----------|---------|----------|-----------------|
| Conceptual Understanding | .395     | .000    | Rejected | Significant     |
| Mathematical Reasoning   | .384     | .000    | Rejected | Significant     |
| Problem-Solving Ability  | .166     | .065    | Accepted | Not Significant |
| Classroom Engagement     | .385     | .000    | Rejected | Significant     |

### Conclusions & Recommendations

The study concluded that teachers' conceptual and procedural pedagogical approaches have a high positive effect on the mathematical performance of Grade 7 students, particularly in enhancing conceptual understanding, mathematical reasoning, and classroom engagement. The majority of the respondents demonstrated outstanding mathematical performance, indicating that the instructional approaches employed by teachers effectively supported students' mathematics learning. Furthermore, age and fathers' educational attainment significantly influenced students' problem-solving ability, while the other profile variables showed no significant differences. The study also established significant positive relationships between teachers' conceptual and procedural pedagogical approaches and students' mathematical performance in terms of conceptual understanding, mathematical reasoning, and classroom engagement, although no significant relationship was found with problem-solving ability.

Based on these findings, it is recommended that school administrators strengthen instructional support programs and provide adequate learning resources to sustain effective mathematics teaching. Mathematics teachers should continue integrating conceptual and procedural pedagogical approaches while incorporating more problem-based, inquiry-based, and collaborative learning activities to further enhance students' problem-solving ability. Professional development programs and in-service training focusing on innovative mathematics instruction should likewise be provided to teachers. Parents, particularly fathers, should be encouraged to become more actively involved in supporting their children's mathematics learning at home. Finally, the proposed action plan should be implemented, monitored, and evaluated regularly to ensure continuous improvement in students' mathematical performance and overall mathematics achievement.

### Compliance with ethical standards

The author declares no conflict of interest. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. This study was self-funded. The authors thank the participating respondents for their contributions

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