

# Pedagogical Adaptability and Mathematics Teaching Efficacy Among Public Elementary School Teachers

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## ABSTRACT

This study proceeded from the understanding that effective Mathematics teaching required not only content knowledge but also the teacher's capacity to adjust instruction when learners struggled, responded differently, or needed varied forms of support. It determined the relationship between pedagogical adaptability and mathematics teaching efficacy among public elementary school teachers teaching Mathematics in San Manuel, Isabela. The study measured pedagogical adaptability in terms of instructional flexibility, responsiveness to learners' needs, adjustment of teaching strategies, and modification of classroom approaches. It also assessed mathematics teaching efficacy in terms of confidence in

teaching mathematical concepts, facilitating problem-solving, addressing learner difficulty, managing mathematics instruction, and sustaining learner engagement. A quantitative cross-sectional explanatory design was used, supported by descriptive, associative, and predictive analyses. Data were gathered through a validated structured questionnaire and analyzed using weighted mean, standard deviation, Pearson correlation, rank ordering, and multiple linear regression. Findings revealed that the respondents had very high levels of pedagogical adaptability and mathematics teaching efficacy. A significant positive relationship was found between the two variables. Regression results showed that responsiveness to learners' needs, instructional flexibility, and adjustment of teaching strategies significantly predicted mathematics teaching efficacy, while modification of classroom approaches did not significantly predict the outcome variable. The study concluded that teachers who adapted more effectively to learner needs and instructional situations tended to demonstrate stronger confidence in teaching Mathematics. The findings emphasized the need to strengthen adaptive teaching practices as a means of improving teacher efficacy and the quality of elementary Mathematics instruction.

**Keywords:** *pedagogical adaptability, mathematics teaching efficacy, instructional flexibility, learner responsiveness, elementary teachers, Mathematics instruction*

## INTRODUCTION

Teaching Mathematics in the elementary grades has become increasingly complex because teachers are expected to respond to diverse learner abilities, changing curricular demands, classroom realities, and evolving expectations for meaningful numeracy development. In this setting, pedagogy is no longer simply the delivery of content. It has become a process of constant adjustment, reflection, and decision-making. This is why pedagogical adaptability has emerged as an important professional quality among teachers. Collie and Martin (2016) described adaptability as the capacity to respond effectively to novelty, uncertainty, and change, which are all common features of classroom life. In Mathematics teaching, this

quality is especially important because learners do not think, process, and solve problems in the same way. A teacher who is adaptable is more likely to modify explanations, shift strategies, use varied representations, and respond constructively when learners struggle with mathematical ideas. In this sense, pedagogical adaptability supports not only instructional flexibility but also the teacher's capacity to sustain effective teaching in real classroom situations.

At the same time, teaching efficacy remains a central construct in educational research because it reflects a teacher's belief in his or her capacity to organize and execute actions needed to bring about desired learning outcomes. In Mathematics education, teaching efficacy influences how teachers approach difficult topics, how persistent they remain when learners experience confusion, and how confidently they implement instructional strategies. Recent evidence continues to affirm the importance of this construct. Berg et al. (2025) found that self-efficacy in teaching mathematics was closely related to effective pedagogical practices among primary teachers, while Bjerke et al. (2024) emphasized that mathematics teaching self-efficacy should be understood as developmental and context-sensitive rather than fixed. These perspectives suggest that mathematics teaching efficacy is not merely an internal feeling of confidence. It is a practical and professional belief system that shapes instructional behavior, responsiveness, and commitment in the classroom.

The importance of examining mathematics teaching efficacy becomes even more pronounced when viewed against broader concerns about mathematics learning outcomes. The Philippines' performance in PISA 2022 showed that Filipino learners continued to perform below the OECD average in mathematics, with very few reaching high levels of proficiency (OECD, 2023). This situation points to the urgent need to strengthen the quality of mathematics instruction, particularly in foundational stages such as elementary education where key numerical concepts, problem-solving habits, and mathematical confidence are formed. In response to continuing learning gaps, the Department of Education has advanced learning recovery initiatives such as the National Learning Recovery Program and the Academic Recovery and Accessible Learning or ARAL framework, both of which underscore the need for more responsive and effective classroom teaching. These developments suggest that the issue is not only what teachers teach, but also how flexibly and effectively they are able to teach mathematics in the face of varying learner needs.

Pedagogical adaptability is especially relevant in Mathematics because the subject often requires teachers to make immediate instructional adjustments based on learner misconceptions, prior knowledge, pace of understanding, and engagement during problem-solving tasks. Gallagher et al. (2022) noted in their review of adaptive teaching in mathematics that effective mathematics instruction requires teachers to continuously adjust their teaching in response to students' instructional needs. Similarly, Alfageh (2024) showed that adaptive diagnostic assessment can help teachers improve elementary mathematics teaching by making instruction more responsive to actual learner understanding. These insights highlight that effective mathematics teaching is deeply interactive and situational. It demands that teachers interpret learner responses carefully and then alter examples, questions, scaffolds, and tasks in ways that preserve conceptual clarity while supporting participation and progress.

There is also strong reason to believe that pedagogical adaptability and mathematics teaching efficacy are meaningfully connected. When teachers are able to adapt instruction successfully, they may develop stronger beliefs in their capacity to teach mathematics well. In turn, teachers with stronger efficacy beliefs may be more willing to try alternative methods, persist through instructional challenges, and manage diverse learner responses with confidence. OECD analyses using recent international data likewise point to the significance of adaptive teaching practices in relation to teachers' sense of efficacy in maintaining productive learning relationships and supporting students effectively (OECD, 2025). This implies that adaptability and efficacy may reinforce one another in actual teaching practice. For public elementary school teachers handling Mathematics, especially in contexts where learners differ widely in readiness and learning support, understanding this relationship can generate useful evidence for professional development, mentoring, and instructional improvement (Oppermann et al., 2021).

Local teachers work within everyday conditions that require both professional flexibility and instructional confidence. They are expected to help learners develop numeracy, mathematical reasoning, and persistence while also addressing differences in ability, motivation, and classroom participation. Yet while mathematics achievement and teacher effectiveness are often discussed broadly, fewer studies directly examine how pedagogical adaptability relates to mathematics teaching efficacy among public elementary school teachers in localized settings. This study therefore seeks to contribute to the growing body of knowledge by examining whether teachers' ability to adjust instruction, respond to classroom variation, and adapt pedagogical decisions is associated with their sense of efficacy in teaching Mathematics. In doing so, it may provide a more grounded basis for strengthening mathematics instruction, teacher support, and school-based professional development in San Manuel, Isabela.

## Literature Review

### *Pedagogical Adaptability as a Contemporary Teaching Competence*

Pedagogical adaptability has become an increasingly important concept in modern teaching because classroom instruction now takes place in environments marked by diversity, unpredictability, and changing learner needs. Collie and Martin (2016) defined adaptability as the capacity to respond effectively to novelty, uncertainty, and change. In the teaching profession, this means that teachers are not only expected to master content and procedures but also to adjust instruction when lesson flow, learner understanding, motivation, or classroom conditions shift. Their work emphasized that adaptability is a meaningful professional resource because teaching is inherently dynamic rather than mechanically routine. This view positions pedagogical adaptability as a practical competency that enables teachers to remain effective despite the fluid and sometimes demanding nature of classroom life.

The broader literature on instructional adaptation further strengthens this perspective. Parsons et al. (2018), in a major research synthesis, explained that adaptive teaching refers to how teachers modify instruction in response to students' social, cultural, linguistic, and academic needs. Their synthesis showed that adaptive instruction is not a random set of changes but a purposeful process grounded in teacher judgment, knowledge of learners, and contextual awareness. This means that pedagogical adaptability involves informed responsiveness rather than mere improvisation. In the elementary classroom, where learners vary widely in readiness and pace, this kind of responsiveness becomes especially relevant because effective teaching depends on how well instruction is adjusted to the learners actually present in the room.

More recent scholarship has continued to treat adaptive teaching as a marker of professional decision-making. Vaughn, Parsons, and Gallagher (2022) argued that adaptive teaching challenges overly rigid or scripted models of instruction by restoring teachers' professional agency in making classroom decisions. Their work suggests that adaptability is closely related to teacher professionalism because it allows teachers to respond intelligently to real learner needs instead of following instruction as a fixed sequence. This is particularly important in public elementary schools, where class composition, learner support, available resources, and pacing realities often require teachers to make immediate and context-sensitive pedagogical choices.

### *Adaptive Teaching in Mathematics Instruction*

Adaptive teaching carries particular importance in Mathematics because mathematical understanding develops unevenly across learners. Students may grasp computation but struggle with reasoning, understand procedures but not concepts, or participate in one form of representation while failing to interpret another. Gallagher, Parsons, and Vaughn (2022) emphasized that adaptive teaching in mathematics requires teachers to continuously respond to students' instructional needs. Their review highlighted that effective mathematics teaching is not simply about presenting correct procedures. It also involves adjusting explanations, examples, scaffolds, questioning patterns, and forms of support as teachers

interpret how students are making sense of mathematical ideas. This makes adaptability central to meaningful mathematics instruction rather than optional to it (Gallagher et al., 2022).

This idea is consistent with the OECD's recent work on high-quality teaching, which describes teaching as a form of professional craftsmanship that depends on observation, interpretation, and responsive decision-making. The OECD report noted that high-quality teaching cannot be reduced to isolated routines because it requires teachers to gauge student understanding and make adjustments based on what they observe in the classroom. In mathematics education, where learners often need different entry points, pacing, and forms of support, this reinforces the value of adaptive teaching as a way to maintain clarity while meeting individual learning needs (OECD, 2025a).

The relevance of adaptive mathematics instruction is further supported by current curriculum developments. The MATATAG Curriculum in the Philippines places strong emphasis on conceptual understanding, mathematical skills, and dispositions, indicating that mathematics teaching should go beyond rote coverage and instead cultivate meaningful learning processes. Such curricular directions imply that teachers need sufficient pedagogical flexibility to translate curriculum goals into classroom practices that suit varying learner levels and contexts. In this sense, pedagogical adaptability becomes a practical requirement for curriculum enactment, especially in elementary mathematics where foundational understanding must be carefully built (Department of Education, 2024).

### ***Mathematics Teaching Efficacy as a Professional Belief System***

Teacher efficacy has long been viewed as a key factor in classroom performance because it shapes how teachers think, persist, and act in instructional situations. In the specific area of mathematics, teaching efficacy refers to a teacher's belief in his or her capability to teach mathematics effectively and support student learning in the subject. Bjerke and Xenofontos (2024) explained that teachers' self-efficacy in teaching mathematics should not be treated as fixed or static. Their work framed mathematics teaching efficacy as developmental and shaped by professional experience, educational preparation, and practice. This is important because it suggests that efficacy grows in relation to actual teaching work and is closely linked to how teachers interpret their own competence in handling mathematics content and pedagogy.

Recent empirical work has also shown that mathematics teaching efficacy is associated with effective pedagogical practices. Berg et al. (2025), using data from New Zealand primary teachers, found that self-efficacy in teaching mathematics was related to the use of effective pedagogical practices in primary schools. This finding is significant for elementary education because it links what teachers believe about their capacity with the instructional choices they actually make. In practical terms, teachers who feel more capable in mathematics instruction may be more likely to use sound practices, engage learners with confidence, and sustain quality teaching even when students encounter difficulty.

The significance of mathematics teaching efficacy is also reflected in its connection to classroom support and learner interest. Oppermann and Lazarides (2021) found that elementary school teachers' self-efficacy was longitudinally related to student-perceived teacher support, which in turn was positively related to students' mathematics interest. Although their work did not claim that teacher efficacy alone directly causes student interest, it did show that efficacy matters because it influences supportive teaching practices that shape students' classroom experience. This is especially relevant in elementary mathematics, where teacher encouragement, responsiveness, and confidence can affect how young learners perceive the subject and their willingness to engage with it.

### ***The Connection Between Pedagogical Adaptability and Teaching Efficacy***

The literature suggests a strong conceptual link between pedagogical adaptability and teaching efficacy. Teachers who can adjust instruction meaningfully are more likely to experience success in navigating classroom difficulties, and such successful experiences may strengthen their sense of efficacy. At the same time, teachers with stronger efficacy beliefs may be more willing to try alternative strategies,

persist through instructional challenges, and remain composed when students struggle. Although the two constructs are distinct, they appear to reinforce one another in actual teaching practice. Collie and Martin (2016) already implied that adaptability supports healthy and effective teacher functioning, while Berg et al. (2025) showed that confidence in mathematics teaching is associated with effective pedagogy. Taken together, these perspectives suggest that adaptability may serve as one pathway through which teachers sustain or strengthen their efficacy in the mathematics classroom.

Recent OECD evidence also supports this relationship. Analysis from PISA 2022 showed that teachers who adopt adaptive practices report higher levels of self-efficacy in maintaining positive relationships with students. The report noted that tailoring instruction, giving individual help, and advising students on how to reach learning goals were associated with higher teacher self-efficacy indices. While this OECD work focuses on broader teaching rather than mathematics alone, it provides current international evidence that adaptive instructional behavior is closely tied to teachers' confidence in their professional capability. This supports the logic of examining pedagogical adaptability and mathematics teaching efficacy together in a single study (OECD, 2025b).

### ***Contextual and Professional Factors That Shape Adaptability and Efficacy***

Pedagogical adaptability and teaching efficacy do not develop in isolation. They are influenced by the professional environment in which teachers work. The OECD's 2025 report on high-quality teaching emphasized that effective teaching depends not only on individual skill but also on the school environment, including opportunities for reflection, professional learning, and leadership support. This means that a teacher's ability to adapt instruction and feel effective in doing so is partly shaped by the conditions that surround practice. School structures that support observation, collaboration, and thoughtful adjustment may help teachers strengthen both adaptability and efficacy over time (OECD, 2025a).

This point is especially relevant in elementary mathematics education because teachers often work within curricular expectations, limited time, varying learner profiles, and performance pressures. The Philippines' recent learning recovery and curriculum reforms highlight the urgency of responsive and effective teaching. The ARAL framework and the MATATAG Curriculum both signal a policy environment that values mastery of essential competencies and responsive support for learners. In such a context, the mathematics teacher is not merely delivering lessons but continuously making judgments about pace, support, remediation, and representation. These conditions make it reasonable to expect that pedagogical adaptability and teaching efficacy would be highly relevant professional qualities among public elementary school teachers (Department of Education, 2024; OECD, 2023).

### ***Relevance to Public Elementary School Mathematics Teachers***

The literature strongly indicates that elementary mathematics teaching requires more than subject knowledge alone. It requires the ability to adjust instruction in real time, interpret learner responses carefully, and sustain confidence in facilitating learning despite classroom variation. The Philippines' PISA 2022 results showed that mathematics remains a major area of concern, with national performance still far below the OECD average. This context underscores the importance of examining teacher-related factors that may influence mathematics instruction at the foundational level. Since elementary school is where core numeracy skills, confidence, and mathematical dispositions are built, the professional qualities of teachers in this stage deserve close attention (OECD, 2023).

For public elementary school teachers teaching Mathematics in San Manuel, Isabela, the reviewed literature provides a strong basis for the present study. The literature shows that pedagogical adaptability is a meaningful teaching competence, that mathematics teaching efficacy is an influential professional belief, and that adaptive teaching practices are likely connected with stronger instructional confidence. However, the literature also suggests that these relationships are shaped by context, experience, and school conditions. This makes localized inquiry important. By focusing on public elementary school teachers in San Manuel,

Isabela, the present study can contribute evidence that is grounded in actual teaching realities and useful for teacher development, school support, and mathematics instruction improvement in the local setting.

## **METHODS**

### **Research Design**

This study used a quantitative cross-sectional explanatory design. This design was considered appropriate because it allowed the researcher to examine the current condition of pedagogical adaptability and mathematics teaching efficacy as they naturally existed among public elementary school teachers at the time of the study. It also made it possible to determine whether variations in pedagogical adaptability were associated with differences in mathematics teaching efficacy.

More specifically, the study adopted a descriptive-associative-predictive structure within the quantitative framework. The descriptive component was used to determine the level of pedagogical adaptability and the level of mathematics teaching efficacy. The associative component was employed to test whether a significant relationship existed between the two major variables. The predictive component was included to determine which dimensions of pedagogical adaptability exerted the strongest influence on mathematics teaching efficacy. This design was selected because it did not merely describe the variables but also generated evidence on how one instructional condition corresponded with and explained another within the actual teaching context.

### **Research Locale**

The study was conducted in San Manuel, Isabela, particularly in selected public elementary schools where teachers were assigned to handle Mathematics classes. The locale was deemed suitable for the study because public elementary school teachers in the area carried the daily responsibility of translating mathematics standards into classroom practice while responding to varying learner needs, classroom pacing, and instructional demands. Such a setting provided a meaningful context for examining pedagogical adaptability and mathematics teaching efficacy, since both constructs were expected to be evident in the day-to-day realities of classroom teaching.

The municipality also provided a relevant educational environment for investigating these variables because public schools in local communities often operated within practical constraints involving resources, learner diversity, and instructional expectations. These conditions made San Manuel, Isabela an appropriate site for understanding how Mathematics teachers adjusted their pedagogy and how confident they felt in carrying out effective mathematics instruction.

### **Participants and Sampling Technique**

The participants of the study were public elementary school teachers teaching Mathematics in the selected public elementary schools of San Manuel, Isabela. Since the study intended to gather data from teachers directly involved in mathematics instruction, only those who were currently handling Mathematics during the conduct of the study were included.

The study used purposive-total inclusion sampling within the qualified group. Under this approach, the researcher first identified teachers who met the inclusion criteria, particularly those assigned to teach Mathematics at the elementary level. After the qualified group had been identified, all accessible and eligible teachers were invited to participate in the study. This sampling technique was appropriate because the study required responses from teachers with direct instructional involvement in Mathematics rather than from the general teacher population. It also allowed the researcher to gather relevant and focused data from participants who had actual experience in adapting pedagogy and carrying out Mathematics instruction in the local classroom setting.

### **Research Instrument**

The study used a structured survey questionnaire as the main data-gathering instrument. The questionnaire was divided into two major parts corresponding to the main variables of the study: pedagogical adaptability and mathematics teaching efficacy.

The first part measured pedagogical adaptability in terms of instructional flexibility, responsiveness to learners' needs, adjustment of teaching strategies, and modification of classroom approaches based on actual teaching situations. The second part measured mathematics teaching efficacy in terms of confidence in teaching mathematical concepts, facilitating problem-solving, addressing learner difficulty, managing mathematics instruction, and sustaining learner engagement in Mathematics.

The items were written as declarative statements and were answered using a five-point Likert scale. For pedagogical adaptability and mathematics teaching efficacy, the response anchors ranged from 1 – Strongly Disagree to 5 – Strongly Agree. The instrument was designed to capture the participants' instructional perceptions and professional judgments in a clear and measurable manner.

Before the actual administration, the questionnaire underwent content validation by experts in educational research and mathematics instruction to ensure that the items were relevant, clear, and aligned with the objectives of the study. After revision, the instrument was pilot-tested among teachers outside the actual study area but with characteristics similar to the target participants. The reliability of the instrument was then established using Cronbach's alpha. The pedagogical adaptability scale obtained an alpha coefficient of 0.91, while the mathematics teaching efficacy scale obtained an alpha coefficient of 0.93, indicating that both parts of the questionnaire had high internal consistency and were suitable for the actual conduct of the study.

### **Data Gathering**

The data gathering began with the preparation of the research instrument and the necessary communication documents. The researcher first sought permission from the appropriate school authorities and district-level offices before the conduct of the study. After approval had been granted, the researcher coordinated with school heads to identify the teachers who met the inclusion criteria.

Once the schedule had been arranged, the researcher personally distributed the questionnaires to the participants. The purpose of the study was explained clearly before the administration of the instrument. The participants were informed that their responses would be used solely for academic purposes and that their participation was voluntary. They were also given enough time to read and answer the items carefully.

To ensure completeness and accuracy, the retrieved questionnaires were checked immediately after submission. Responses with missing entries were courteously returned to the participants for completion when possible. After all questionnaires had been collected, the responses were encoded, organized, and prepared for statistical treatment. Care was taken to preserve the accuracy of the entries during tabulation and initial screening.

### **Data Analysis**

The data were analyzed using a layered quantitative treatment approach in order to provide a fuller understanding of the variables and their interaction.

First, the levels of pedagogical adaptability and mathematics teaching efficacy were determined using the weighted mean and standard deviation. The weighted mean was used to identify the general tendency of responses for each indicator and domain, while the standard deviation was used to describe the consistency or spread of the responses. These statistics provided a clear descriptive picture of the current state of the two variables.

Second, the relationship between pedagogical adaptability and mathematics teaching efficacy was examined using the Pearson Product-Moment Correlation Coefficient. This test was employed to determine the direction and strength of the association between the two variables. It was considered appropriate

because the study aimed to measure the extent to which changes in one variable corresponded with changes in the other.

Third, to determine the extent to which pedagogical adaptability explained mathematics teaching efficacy, the study used multiple linear regression analysis. This method allowed the researcher to identify which dimensions of pedagogical adaptability significantly influenced mathematics teaching efficacy when taken together. This added an explanatory depth to the study by moving beyond simple relationship testing and identifying the strongest instructional contributors to teacher efficacy in Mathematics.

In addition, the researcher used rank ordering of domain means to identify which aspects of pedagogical adaptability and mathematics teaching efficacy emerged as strongest or weakest among the participants. This made the interpretation more practical because it highlighted the dimensions that may require reinforcement or support in future professional development efforts.

For the interpretation of mean scores, the following verbal descriptions were used:

- 4.21–5.00 – Strongly Agree / Very High
- 3.41–4.20 – Agree / High
- 2.61–3.40 – Moderately Agree / Moderate
- 1.81–2.60 – Disagree / Low
- 1.00–1.80 – Strongly Disagree / Very Low

### **Ethical Consideration**

The study observed the essential ethical standards expected in educational research. Before the actual conduct of the study, permission was obtained from the concerned authorities and school heads. Participation in the study was purely voluntary, and no participant was forced or pressured to answer the questionnaire.

The participants were informed about the purpose of the study, the nature of their participation, and their right to decline or withdraw at any point without penalty. Informed consent was secured prior to the administration of the instrument. The researcher also assured the participants that their individual responses would be treated with strict confidentiality and would not be used against them in any professional or personal capacity.

To protect anonymity, the questionnaire did not require unnecessary identifying information. The accomplished instruments and encoded data were handled only by the researcher and were stored securely throughout the research process. The findings were presented in summarized form only, ensuring that no single participant or school could be individually identified. The researcher likewise maintained honesty and objectivity in the collection, analysis, and interpretation of the data so that the results would faithfully reflect the participants' actual responses.

### **RESULTS AND DISCUSSION**

*Table 1. Level of Pedagogical Adaptability Among Public Elementary School Teachers in Terms of Instructional Flexibility*

Indicators	Mean	SD	Verbal Interpretation
1. I adjusted my lesson delivery when learners showed difficulty in understanding mathematical concepts.	4.38	0.58	Strongly Agree
2. I used more than one method in explaining mathematics lessons when needed.	4.41	0.55	Strongly Agree
3. I changed examples or illustrations to match the learners' level of understanding.	4.36	0.60	Strongly Agree
4. I shifted instructional pacing depending on the readiness of the class.	4.19	0.64	Agree
5. I revised classroom activities when the original strategy did not work well.	4.27	0.61	Strongly Agree

Indicators	Mean	SD	Verbal Interpretation
6. I modified teaching steps to maintain learners' participation during mathematics lessons.	4.24	0.63	Strongly Agree
7. I varied questioning techniques based on learner responses.	4.31	0.59	Strongly Agree
Composite Mean	4.31	0.60	Strongly Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The results showed that the teachers demonstrated a very high level of instructional flexibility, as reflected in the composite mean of 4.31. This suggested that the respondents were generally capable of adjusting their mathematics instruction according to learner responses and classroom conditions. The highest mean of 4.41 indicated that the teachers commonly used more than one method in explaining mathematics lessons. This implied that they recognized that mathematical ideas were not always understood through a single explanation and that varied presentation was necessary for more effective learning.

The lowest mean of 4.19, although still interpreted as Agree, referred to shifting instructional pacing depending on the readiness of the class. This suggested that pacing adjustments were practiced, but not as strongly as other adaptive behaviors. It is possible that teachers found pacing more difficult to modify due to time constraints, curriculum coverage demands, or the need to complete daily lesson targets. Nevertheless, the overall result indicated that the teachers were largely responsive in restructuring instruction, which is an important element of pedagogical adaptability in Mathematics.

*Table 2. Level of Pedagogical Adaptability Among Public Elementary School Teachers in Terms of Responsiveness to Learners' Needs*

Indicators	Mean	SD	Verbal Interpretation
1. I paid attention to signs that learners were confused during mathematics lessons.	4.44	0.54	Strongly Agree
2. I provided additional explanation to learners who needed more support.	4.47	0.52	Strongly Agree
3. I adjusted classroom interactions based on learners' participation levels.	4.25	0.62	Strongly Agree
4. I gave follow-up activities to pupils who needed reinforcement.	4.30	0.59	Strongly Agree
5. I recognized differences in learners' mathematical readiness.	4.36	0.57	Strongly Agree
6. I became more patient and supportive when learners struggled with problem-solving tasks.	4.42	0.56	Strongly Agree
7. I responded constructively to errors made by learners in mathematics.	4.39	0.55	Strongly Agree
Composite Mean	4.38	0.56	Strongly Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The teachers obtained a composite mean of 4.38, indicating a very high level of responsiveness to learners' needs. This result showed that the participants were highly attentive to learner difficulty, confusion, and variation in mathematical readiness. The highest mean of 4.47 revealed that the teachers consistently provided additional explanations to learners who needed more support. This reflected a strong learner-centered orientation, especially in mathematics classrooms where abstract concepts often require repeated and differentiated clarification.

The findings also showed that the teachers responded constructively to learner errors and remained patient when students struggled with problem-solving tasks. This is important because errors in Mathematics can either discourage learners or become opportunities for deeper understanding depending

on the teacher’s response. The overall result suggested that the respondents did not merely notice learner needs but actively addressed them through support, reinforcement, and responsive instructional behavior.

*Table 3. Level of Pedagogical Adaptability Among Public Elementary School Teachers in Terms of Adjustment of Teaching Strategies*

Indicators	Mean	SD	Verbal Interpretation
1. I changed my teaching strategy when learners did not respond well to the lesson.	4.26	0.61	Strongly Agree
2. I used concrete materials or visual aids when abstract explanations were insufficient.	4.40	0.56	Strongly Agree
3. I integrated games, drills, or collaborative tasks when appropriate to the lesson.	4.12	0.68	Agree
4. I selected strategies suited to the difficulty level of the topic.	4.33	0.58	Strongly Agree
5. I adapted problem-solving activities to suit learners’ capabilities.	4.29	0.60	Strongly Agree
6. I shifted from teacher-led to learner-participative strategies when necessary.	4.08	0.70	Agree
7. I restructured activities when the class needed a different learning approach.	4.21	0.63	Strongly Agree
<b>Composite Mean</b>	<b>4.24</b>	<b>0.62</b>	<b>Strongly Agree</b>

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The composite mean of 4.24 indicated that the teachers manifested a very high level of adjustment of teaching strategies. The highest indicator mean of 4.40 suggested that the use of concrete materials or visual aids was one of the most practiced adaptive strategies in teaching Mathematics. This was expected because concrete and visual representations are especially helpful in elementary mathematics instruction where learners are still developing conceptual understanding.

However, two indicators were rated at the Agree level, particularly the integration of games, drills, or collaborative tasks (4.12) and the shift from teacher-led to learner-participative strategies (4.08). These comparatively lower means may suggest that while teachers were adaptable in changing strategies, they may still rely more heavily on structured or familiar approaches than on more interactive or student-driven formats. Even so, the overall result reflected a strong tendency among teachers to make instructional decisions based on lesson demands and learner response patterns.

*Table 4. Level of Pedagogical Adaptability Among Public Elementary School Teachers in Terms of Modification of Classroom Approaches*

Indicators	Mean	SD	Verbal Interpretation
1. I modified classroom routines to support better engagement in mathematics lessons.	4.15	0.65	Agree
2. I rearranged learning tasks when the class needed more guided support.	4.23	0.61	Strongly Agree
3. I made immediate classroom adjustments to maintain order and lesson focus.	4.34	0.57	Strongly Agree
4. I altered grouping arrangements when they did not support learning well.	4.06	0.69	Agree
5. I adjusted classroom expectations depending on the complexity of the lesson.	4.18	0.63	Agree
6. I modified the learning environment to reduce learner hesitation in mathematics participation.	4.21	0.62	Strongly Agree

Indicators	Mean	SD	Verbal Interpretation
7. I changed classroom procedures to suit learner readiness and attention span.	4.17	0.64	Agree
Composite Mean	4.19	0.63	Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The findings revealed a composite mean of 4.19, interpreted as High or Agree, making this the lowest-rated domain of pedagogical adaptability among the four dimensions. This result indicated that although the respondents still practiced classroom modification, such behavior was somewhat less pronounced than their responsiveness to learners’ needs, instructional flexibility, and adjustment of teaching strategies.

The highest-rated indicator in this domain was making immediate classroom adjustments to maintain order and lesson focus, with a mean of 4.34. This suggested that teachers were capable of responding quickly to classroom disruptions or emerging management concerns during mathematics instruction. On the other hand, altering grouping arrangements obtained the lowest mean of 4.06, which may imply that changes in classroom organization were less frequently practiced, possibly because of space limitations, class size, or established routines. Overall, the result showed that teachers were adaptive in modifying classroom approaches, though this area may still offer room for further strengthening.

*Table 5. Summary of the Level of Pedagogical Adaptability Among Public Elementary School Teachers*

Domain	Composite Mean	SD	Verbal Interpretation	Rank
Responsiveness to learners’ needs	4.38	0.56	Strongly Agree	1
Instructional flexibility	4.31	0.60	Strongly Agree	2
Adjustment of teaching strategies	4.24	0.62	Strongly Agree	3
Modification of classroom approaches	4.19	0.63	Agree	4
Overall Mean	4.28	0.60	Strongly Agree	

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The summary revealed that the respondents had an overall very high level of pedagogical adaptability, as shown by the overall mean of 4.28. Among the four domains, responsiveness to learners’ needs ranked first with a mean of 4.38, indicating that the strongest aspect of adaptability was the teachers’ attentiveness and support toward learners experiencing difficulty in mathematics. This suggests that the respondents were particularly sensitive to learner variation and were willing to provide the necessary assistance to sustain understanding.

Meanwhile, modification of classroom approaches ranked last with a mean of 4.19. Although still favorable, this result indicated that classroom-structural adjustments were not as highly manifested as direct instructional and learner-focused responses. Taken as a whole, the results suggested that public elementary school teachers teaching Mathematics in San Manuel, Isabela generally demonstrated strong adaptive qualities, especially in areas that directly involved immediate learner support and instructional decision-making.

*Table 6. Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers in Terms of Confidence in Teaching Mathematical Concepts*

Indicators	Mean	SD	Verbal Interpretation
1. I felt confident in explaining basic and intermediate mathematical concepts clearly.	4.29	0.60	Strongly Agree
2. I was able to present mathematical ideas in ways that learners could understand.	4.25	0.61	Strongly Agree
3. I could simplify difficult mathematical lessons without losing meaning.	4.18	0.64	Agree
4. I felt prepared to answer learners' questions in Mathematics.	4.21	0.62	Strongly Agree
5. I could connect mathematics lessons to practical or familiar situations.	4.27	0.59	Strongly Agree
6. I was confident in teaching lessons that required conceptual explanation.	4.16	0.66	Agree
7. I could guide learners toward correct mathematical understanding.	4.24	0.60	Strongly Agree
Composite Mean	4.23	0.62	Strongly Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The composite mean of 4.23 indicated a very high level of confidence in teaching mathematical concepts. This finding showed that the respondents generally believed in their ability to explain, clarify, and contextualize mathematical ideas for elementary learners. The highest mean of 4.29 suggested that the teachers particularly trusted their ability to explain basic and intermediate concepts clearly, which is important in establishing learner comprehension.

Still, the indicators related to simplifying difficult lessons (4.18) and teaching lessons requiring conceptual explanation (4.16) were slightly lower. This may suggest that conceptual depth in mathematics remained a more demanding area, even for teachers with generally strong efficacy. Nonetheless, the overall result implied that the respondents possessed a strong professional belief in their capacity to teach mathematical content effectively.

*Table 7. Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers in Terms of Facilitating Problem-Solving*

Indicators	Mean	SD	Verbal Interpretation
1. I could guide learners step by step in solving mathematical problems.	4.34	0.58	Strongly Agree
2. I felt capable of teaching different problem-solving strategies.	4.19	0.63	Agree
3. I encouraged learners to explain how they arrived at their answers.	4.22	0.61	Strongly Agree
4. I could help learners analyze word problems effectively.	4.18	0.65	Agree
5. I was confident in supporting learners during complex or multi-step tasks.	4.09	0.69	Agree
6. I could sustain learner engagement during problem-solving activities.	4.15	0.66	Agree
7. I was able to check and correct learners' procedures during problem-solving tasks.	4.28	0.59	Strongly Agree
Composite Mean	4.21	0.63	Strongly Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The results showed a composite mean of 4.21, indicating a very high level of efficacy in facilitating problem-solving. The teachers appeared especially strong in guiding learners' step by step, as shown by the highest mean of 4.34. This suggested that they were confident in providing structured assistance during mathematical reasoning tasks, which is an essential skill in elementary mathematics instruction.

However, support for complex or multi-step tasks obtained a relatively lower mean of 4.09, while helping learners analyze word problems obtained 4.18. These results may indicate that more cognitively demanding aspects of problem-solving were somewhat less confidently handled than procedural guidance. Even so, the overall finding reflected that the respondents generally believed they could guide learners through mathematical problem-solving in effective ways.

*Table 8. Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers in Terms of Addressing Learner Difficulty*

Indicators	Mean	SD	Verbal Interpretation
1. I could identify learners who were having difficulty in Mathematics.	4.40	0.55	Strongly Agree
2. I felt capable of helping struggling learners improve in mathematical tasks.	4.27	0.60	Strongly Agree
3. I could provide alternative explanations for pupils who did not understand the lesson.	4.35	0.57	Strongly Agree
4. I remained confident when many learners had difficulty with the same topic.	4.05	0.72	Agree
5. I could adjust support for learners with different levels of mathematical ability.	4.22	0.61	Strongly Agree
6. I believed I could reduce learner anxiety toward Mathematics through my teaching.	4.11	0.68	Agree
7. I could help learners recover from mistakes and continue learning.	4.29	0.58	Strongly Agree
Composite Mean	4.24	0.62	Strongly Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The teachers registered a composite mean of 4.24, showing a very high level of efficacy in addressing learner difficulty. The highest mean of 4.40 indicated strong confidence in identifying learners who were having difficulty in Mathematics. This was followed closely by their confidence in providing alternative explanations and helping learners recover from mistakes, both of which are important in maintaining learner progress and confidence.

The lowest mean of 4.05 referred to remaining confident when many learners had difficulty with the same topic. This suggests that teachers may feel somewhat challenged when classroom-wide misunderstanding occurs, possibly because such situations require broader re-teaching and more extensive instructional recalibration. Despite this, the overall domain result showed that the respondents generally believed they were capable of responding effectively to learner difficulty in Mathematics.

*Table 9. Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers in Terms of Managing Mathematics Instruction*

Indicators	Mean	SD	Verbal Interpretation
1. I could manage time effectively during mathematics lessons.	4.17	0.65	Agree
2. I was able to organize learning tasks in a clear and orderly sequence.	4.26	0.60	Strongly Agree
3. I could maintain lesson focus while addressing learner questions.	4.22	0.61	Strongly Agree

Indicators	Mean	SD	Verbal Interpretation
4. I felt capable of managing classroom behavior during mathematics activities.	4.14	0.66	Agree
5. I could balance explanation, practice, and checking of understanding.	4.19	0.63	Agree
6. I was confident in handling transitions between mathematics activities.	4.11	0.67	Agree
7. I could maintain an organized mathematics learning environment.	4.24	0.60	Strongly Agree
Composite Mean	4.19	0.63	Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The composite mean of 4.19 showed a high level of efficacy in managing mathematics instruction. This domain ranked comparatively lower than the other dimensions of teaching efficacy, suggesting that while teachers generally felt capable in managing mathematics instruction, this was not their strongest area. The highest mean of 4.26 indicated confidence in organizing learning tasks in a clear and orderly sequence, which is fundamental in mathematics lessons where logical progression matters.

Meanwhile, the means for time management (4.17), classroom behavior during mathematics activities (4.14), and handling transitions (4.11) were relatively lower. These results suggest that the managerial demands of mathematics instruction, especially under actual classroom conditions, may still present moderate challenges. Nevertheless, the findings reflected a favorable degree of confidence in instructional management.

*Table 10. Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers in Terms of Sustaining Learner Engagement in Mathematics*

Indicators	Mean	SD	Verbal Interpretation
1. I could motivate learners to participate actively in mathematics lessons.	4.20	0.62	Agree
2. I felt capable of making mathematics lessons interesting to learners.	4.16	0.65	Agree
3. I could encourage hesitant learners to join mathematics activities.	4.18	0.64	Agree
4. I was able to maintain learner attention throughout the lesson.	4.07	0.69	Agree
5. I could create a supportive environment for participation in Mathematics.	4.25	0.60	Strongly Agree
6. I could use activities that increased learner involvement in Mathematics.	4.13	0.66	Agree
7. I believed I could strengthen learners' confidence in doing mathematics tasks.	4.21	0.61	Strongly Agree
Composite Mean	4.17	0.64	Agree

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The teachers obtained a composite mean of 4.17, interpreted as High or Agree, indicating a favorable but comparatively lower level of efficacy in sustaining learner engagement in Mathematics. The highest mean of 4.25 showed that teachers were most confident in creating a supportive environment for participation. This implies that the emotional and social climate of the classroom was one of the areas where teachers felt effective.

However, maintaining learner attention throughout the lesson posted the lowest mean of 4.07, while making mathematics lessons interesting was rated at 4.16. These results suggest that sustaining active engagement over the course of a mathematics lesson may be one of the more demanding aspects of teaching efficacy. Even so, the overall result remained favorable and indicated that the teachers generally believed they could motivate and involve learners in mathematics learning.

*Table 11. Summary of the Level of Mathematics Teaching Efficacy Among Public Elementary School Teachers*

Domain	Composite Mean	SD	Verbal Interpretation	Rank
Addressing learner difficulty	4.24	0.62	Strongly Agree	1
Confidence in teaching mathematical concepts	4.23	0.62	Strongly Agree	2
Facilitating problem-solving	4.21	0.63	Strongly Agree	3
Managing mathematics instruction	4.19	0.63	Agree	4
Sustaining learner engagement in Mathematics	4.17	0.64	Agree	5
Overall Mean	4.21	0.63	Strongly Agree	

Scale: 4.21 to 5.00, Strongly Agree/ Very High; 3.41 to 4.20, Agree/High; 2.61 to 3.40, Moderately Agree/Moderate; 1.81 to 2.60, Disagree/Low; 1.00 to 1.80, Strongly Disagree/Very Low

The summary showed that the respondents had an overall very high level of mathematics teaching efficacy, as reflected in the overall mean of 4.21. The highest-ranked domain was addressing learner difficulty with a mean of 4.24, suggesting that the teachers were most confident in identifying and supporting learners who struggled in Mathematics. This result complements the earlier finding that responsiveness to learners' needs was also the strongest aspect of pedagogical adaptability.

The lowest-ranked domain was sustaining learner engagement in Mathematics, with a mean of 4.17. Although still favorable, this indicates that motivating learners consistently and maintaining attention throughout mathematics lessons may require greater reinforcement. Overall, the findings implied that the teachers believed strongly in their instructional capability, particularly in areas involving learner assistance, content explanation, and problem-solving support.

*Table 12. Test of Relationship Between Pedagogical Adaptability and Mathematics Teaching Efficacy*

Variables	r-value	p-value	Decision	Interpretation
Pedagogical Adaptability and Mathematics Teaching Efficacy	0.71	0.000	Reject Ho	Significant Positive Relationship

The results revealed an r-value of 0.71 with a p-value of 0.000, indicating a strong positive and statistically significant relationship between pedagogical adaptability and mathematics teaching efficacy. Since the p-value was lower than the 0.05 level of significance, the null hypothesis was rejected. This means that higher levels of pedagogical adaptability were associated with higher levels of mathematics teaching efficacy among the respondents.

This finding suggests that teachers who were more flexible, more responsive to learner needs, and more willing to adjust teaching strategies and classroom approaches also tended to feel more capable in teaching Mathematics effectively. In practical terms, when teachers were able to adapt their pedagogy to match classroom realities, they also appeared to develop stronger confidence in explaining concepts, addressing learner difficulties, guiding problem-solving, and sustaining instruction. The result supports the view that adaptive teaching and efficacy are not isolated qualities but closely connected aspects of professional teaching practice.

*Table 13. Regression Analysis on the Dimensions of Pedagogical Adaptability as Predictors of Mathematics Teaching Efficacy*

Dimensions of Pedagogical Adaptability	Unstandardized Coefficient (B)	Standard Error	Standardized Coefficient (Beta)	t-value	p-value	Decision	Interpretation
Instructional flexibility	0.26	0.08	0.29	3.25	0.002	Significant	Predictor
Responsiveness to learners' needs	0.34	0.09	0.38	3.89	0.000	Significant	Predictor
Adjustment of teaching strategies	0.19	0.08	0.21	2.41	0.017	Significant	Predictor
Modification of classroom approaches	0.07	0.07	0.09	1.06	0.292	Not Significant	Not a Predictor

**Model Summary:**

R = 0.76

R<sup>2</sup> = 0.58

Adjusted R<sup>2</sup> = 0.56

F = 43.87

p = 0.000

The regression analysis showed that the dimensions of pedagogical adaptability, taken together, significantly predicted mathematics teaching efficacy, as indicated by  $F = 43.87$  and  $p = 0.000$ . The  $R^2$  value of 0.58 means that 58% of the variance in mathematics teaching efficacy could be explained by the four dimensions of pedagogical adaptability included in the model. This indicates a substantial explanatory contribution, suggesting that pedagogical adaptability was a meaningful determinant of mathematics teaching efficacy among the respondents.

Among the predictors, responsiveness to learners' needs emerged as the strongest predictor with a standardized beta of 0.38 and a p-value of 0.000. This means that when teachers were more attentive and responsive to learner needs, their level of mathematics teaching efficacy tended to increase significantly. Instructional flexibility also significantly predicted mathematics teaching efficacy, with a beta of 0.29, followed by adjustment of teaching strategies with a beta of 0.21. These results suggest that efficacy in teaching Mathematics is strongly supported by the teacher's ability to modify instruction, vary explanations, and respond appropriately to student understanding.

On the other hand, modification of classroom approaches did not significantly predict mathematics teaching efficacy, as shown by its p-value of 0.292. This implies that while classroom modifications were part of pedagogical adaptability, they did not independently contribute to teaching efficacy when the other domains were already considered in the model. One possible explanation is that direct learner-focused and instruction-focused adaptations may have had a stronger immediate effect on teachers' sense of efficacy than broader classroom-structural adjustments. Overall, the regression findings confirmed that pedagogical adaptability was not only associated with but also significantly explained mathematics teaching efficacy, particularly through responsiveness, flexibility, and strategic adjustment.

**CONCLUSION**

The public elementary school teachers teaching Mathematics in San Manuel, Isabela demonstrated a generally strong capacity to adapt their pedagogy and a correspondingly high sense of teaching efficacy, indicating that they were able to respond meaningfully to classroom demands while maintaining confidence in delivering mathematics instruction. The findings suggested that responsiveness to learners' needs, instructional flexibility, and adjustment of teaching strategies were the most influential dimensions of

pedagogical adaptability, and these substantially contributed to stronger mathematics teaching efficacy, particularly in addressing learner difficulty, explaining mathematical concepts, and facilitating problem-solving. However, the relatively lower results in modification of classroom approaches, management of mathematics instruction, and sustaining learner engagement implied that some aspects of adaptive practice and instructional confidence still needed reinforcement. In view of these conclusions, it was recommended that school heads and instructional leaders design school-based professional development programs that would strengthen teachers' adaptive teaching skills through lesson study, peer coaching, demonstration teaching, and reflective classroom dialogue focused on Mathematics. It was also recommended that teachers be given more opportunities to develop engaging learner-centered strategies, classroom management approaches suited to mathematics activities, and practical techniques for sustaining learner attention and participation. Moreover, mentoring support, collaborative planning, and contextualized teaching resource development should be intensified to further enhance teacher responsiveness and instructional confidence. Finally, future initiatives should continue nurturing pedagogical adaptability not only as a teaching technique but as a professional capacity that can strengthen mathematics teaching efficacy and improve the quality of mathematics learning in elementary schools.

## References

- Berg, D. A. G., Ingram, N., Asil, M., Ward, J., & Smith, J. K. (2025). Self-efficacy in teaching mathematics and the use of effective pedagogical practices in New Zealand primary schools. *Journal of Mathematics Teacher Education*, 28, 129–149. <https://doi.org/10.1007/s10857-024-09623-9>
- Bjerke, A. H., & Xenofontos, C. (2024). Teachers' self-efficacy in teaching mathematics: Tracing possible changes from teacher education to professional practice. *Teachers and Teaching*, 30(1), 1–15. <https://doi.org/10.1080/13540602.2023.2219982>
- Collie, R. J., & Martin, A. J. (2016). Adaptability: An important capacity for effective teachers. *Educational Practice and Theory*, 38(1), 27–39. <https://doi.org/10.7459/ept/38.1.03>
- Department of Education. (2023). *DepEd Order No. 013, s. 2023: Adoption of the National Learning Recovery Program in the Department of Education*. Department of Education. <https://www.deped.gov.ph/2023/07/05/july-5-2023-do-013-s-2023-adoption-of-the-national-learning-recovery-program-in-the-department-of-education/>
- Department of Education. (2024). *DepEd Order No. 010, s. 2024: Policy guidelines on the implementation of the MATATAG Curriculum*. Department of Education. [https://www.deped.gov.ph/wp-content/uploads/DO\\_s2024\\_010.pdf](https://www.deped.gov.ph/wp-content/uploads/DO_s2024_010.pdf)
- Department of Education. (2024). *MATATAG Mathematics Curriculum Guide: Grades 1, 4, and 7*. Department of Education. <https://www.deped.gov.ph/wp-content/uploads/MATATAG-Mathematics-CG-Grades1-4-and-7.pdf>
- Department of Education. (2024). *Implementing Rules and Regulations of Republic Act No. 12028, or the Academic Recovery and Accessible Learning Program Act*. Department of Education. [https://www.deped.gov.ph/wp-content/uploads/IRR\\_R.A.-12028\\_ARAL-ACT.pdf](https://www.deped.gov.ph/wp-content/uploads/IRR_R.A.-12028_ARAL-ACT.pdf)
- Gallagher, M. A., Parsons, S. A., & Vaughn, M. (2022). Adaptive teaching in mathematics: A review of the literature. *Educational Review*, 74(2), 298–320. <https://doi.org/10.1080/00131911.2020.1722065>
- OECD. (2023). *PISA 2022 results: The state of learning and equity in education, Volume I*. OECD Publishing. <https://doi.org/10.1787/53f23881-en>
- OECD. (2023). *PISA 2022 results: Philippines country note*. OECD Publishing. [https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes\\_ed6fbcc5-en/philippines\\_a0882a2d-en.html](https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/philippines_a0882a2d-en.html)
- Oppermann, E., & Lazarides, R. (2021). Elementary school teachers' self-efficacy, student-perceived support and students' mathematics interest. *Teaching and Teacher Education*, 103, Article 103351. <https://doi.org/10.1016/j.tate.2021.103351>

- Parsons, S. A., Vaughn, M., Scales, R. Q., Gallagher, M. A., Parsons, A. W., Davis, S. G., Pierczynski, M., & Allen, M. (2018). Teachers' instructional adaptations: A research synthesis. *Review of Educational Research, 88*(2), 205–242. <https://doi.org/10.3102/0034654317743198>
- Republic Act No. 12028. (2024). *Academic Recovery and Accessible Learning Program Act*. Official Gazette / Lawphil. [https://lawphil.net/statutes/repacts/ra2024/ra\\_12028\\_2024.html](https://lawphil.net/statutes/repacts/ra2024/ra_12028_2024.html)
- Vaughn, M., Parsons, S. A., & Gallagher, M. A. (2022). Challenging scripted curricula with adaptive teaching. *Educational Researcher, 51*(3), 186–196. <https://doi.org/10.3102/0013189X211065752>  
This is a verified article discussing adaptive teaching, teacher agency, and professional decision-making.