United International Journal for Research & Technology

Volume 07, Issue 12, 2026 | Open Access | ISSN: 2582-6832

Teachers' Adaptive Expertise and Instructional Effectiveness

Nonelyn C. Pasagdan

Student, Medina College – Ozamiz City

***Abstract*—** Effective teaching demands more than mastering instructional strategies; it requires the ability to adapt when classroom realities challenge established practices. This study determined the relationship between teachers' adaptive expertise and instructional effectiveness among public elementary school teachers in selected schools of Manukan II District, Schools Division of Zamboanga del Norte. Employing a quantitative descriptive-correlational research design, the study utilized a validated researcher-made questionnaire to assess teachers' adaptive expertise and instructional effectiveness across their respective dimensions. Data were analyzed using descriptive statistics and Pearson product-moment correlation. Findings revealed a Very High level of teachers' adaptive expertise, with adaptive problem-solving emerging as the strongest dimension and continuous professional learning as the least demonstrated. Instructional effectiveness was likewise rated Very High, with assessment and feedback obtaining the highest rating and classroom management the lowest. Furthermore, a statistically significant positive relationship was established between teachers' adaptive expertise and instructional effectiveness, resulting in the rejection of the null hypothesis. The study concluded that teachers possessing stronger adaptive expertise tended to demonstrate greater instructional effectiveness, emphasizing the interconnected roles of flexibility, problem-solving, innovation, reflection, and professional learning in effective teaching. These findings highlight the importance of sustaining teachers' adaptive competencies while strengthening reflective practice, continuous professional learning, instructional delivery, and classroom management to support responsive and effective instruction.

***Keywords*—** adaptive expertise, instructional effectiveness, adaptive problem-solving, reflective practice, professional learning, elementary school teachers

I. INTRODUCTION

Background of the Study

Teaching increasingly requires more than the routine application of established methods because classroom conditions, learner characteristics, instructional demands, and available resources continually change. Within this context, teachers' adaptive expertise reflects their capacity to respond productively to unfamiliar or challenging situations by exercising instructional flexibility, adaptive problem-solving, innovation in teaching, reflective practice, and continuous professional learning. These capacities may be particularly important to instructional effectiveness, which is manifested through purposeful instructional planning and preparation, effective lesson delivery, classroom management, assessment and feedback, and learner engagement. Conceptually, the two variables are closely connected because teachers who can analyze emerging instructional challenges, modify their approaches, reflect on experience, and continuously improve their professional knowledge may be better positioned to implement teaching practices suited to learners and classroom conditions. In this sense, adaptive expertise concerns teachers' capacity to adjust and develop their practice, while instructional effectiveness concerns how successfully those capacities are translated into the teaching process. These dimensions correspond directly to the variables examined in the study.

The need to explore adaptive expertise in teaching has recently been reinforced by the literature. Xiang, Chang, and Yu (2022) showed that teacher adaptive expertise is flexible and manifested in the flexible adaptation and response to new instructional problems. Similarly, Reichenberg (2022) found that reflection on classroom challenges informed teachers' instructional adaptations and supported practices designed to improve learners' access and participation. Building on this, Suh et al. (2023) defined adaptive

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teaching expertise as a developmental capability in which teachers utilize the professional resources to meet complex learning scenarios through focusing on student ideas, agency, flexibility and productive teaching. Similarly, Meneses et al. (2023) demonstrated that adaptive expertise is achieved by reinforcing and deepening the core teaching practices and pedagogical reasoning that are required for making appropriate instructional decisions. Lumbao (2022) found that teachers' adaptability had a significant relationship with teaching effectiveness for public school mathematics teachers in the Philippines, and Munda (2023) also investigated teachers' adaptability and their teaching performance, stressing the importance of teachers' adaptability to the new academic environment and the needs of students. The research findings from these studies suggest that adaptability, reflecting, professional judgment, and good instructional practice are significant, and perhaps interrelated, components of teachers' work.

Although teacher adaptability and teaching effectiveness have received increasing focus, the link between adaptive expertise as a multidimensional professional capacity and teaching effectiveness warrants study in specific educational contexts. Previous research has focused on adaptive expertise in specific domains like academic writing, teacher education, science education, and mathematics, and Philippine studies generally have focused on general adaptability or teaching performance. Within the selected public elementary schools of Manukan II District, there remains a practical need to understand how teachers' capacity for instructional flexibility, problem-solving, innovation, reflection, and continuous learning relates to the effectiveness of their planning, instructional delivery, classroom management, assessment and feedback, and promotion of learner engagement. Examining these dimensions within the local elementary-school context can provide evidence grounded in teachers' actual instructional experiences rather than assuming that relationships identified in other subjects, populations, or educational settings operate similarly in the district.

Accordingly, the study sought to determine the levels of teachers' adaptive expertise and instructional effectiveness and examine the significant relationship between these variables. Adaptive expertise was investigated in terms of instructional flexibility, adaptive problem-solving, innovation in teaching, reflective practice, and continuous professional learning, while instructional effectiveness was assessed through instructional planning and preparation, instructional delivery, classroom management, assessment and feedback, and learner engagement. Findings can offer school administrators, teachers and education officials empirical data for their instructional and professional growth needs. Specifically, outcomes can be used to inform professional development programs and classroom support activities aimed at improving teachers' adaptive skills and maintaining good practice.

Theoretical Framework

This study was anchored on the Theory of Adaptive Expertise of Hatano and Inagaki (1986). The theory distinguishes between adaptive and routine expertise; that is, expertise is more than efficient and accurate performance of familiar procedures. Routine experts are good in situations they know, whereas adaptive experts have conceptual understanding and professional capabilities that allow them to adjust what they know, create new knowledge, and be effective when faced with novel or shifting situations. The theory thus serves as a suitable basis for the understanding of a teacher who is faced with a situation where the conditions of the classroom, the needs of the learners as well as the challenges of the teacher are constantly changing.

Efficiency and innovation are central to Adaptive Expertise Theory. Familiar, routine tasks are best accomplished by professionals with a foundation of knowledge and routine, but when existing routines are not enough to help meet new challenges, adaptive expertise is crucial. Recent scholarship has reinforced this distinction. Pelgrim et al. (2022) explained that adaptive expertise involves developing new solutions and problem-solving approaches when professional situations depart from routine conditions, while environments that encourage observation, interaction, experimentation, and attention to quality can support its development. Likewise, Cai, Li, and Tang (2023)

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found that flexibility, innovation, continuous learning, challenge seeking, and creativity were critical qualities that set adaptive expertise apart from routine performance. Jayawardena, Groenier and Nawarathna (2024) also highlighted that adaptive expertise allows practitioners to apply pre-existing expertise in new ways to meet new demands of work. These principles suggest that expertise develops not merely through repeated experience but through deliberate learning, reflection, conceptual understanding, and the capacity to reconsider established practices.

The principles of Adaptive Expertise Theory were applied in the present study through teachers' instructional flexibility, adaptive problem-solving, innovation in teaching, reflective practice, and continuous professional learning, which constituted the dimensions of teachers' adaptive expertise. Adaptation was illustrated by teachers when they adjusted their teaching based on classroom conditions, reflected on problems before finding solutions, built alternative teaching methods, discussed the effectiveness or shortcomings of their previous teaching, and learned knowledge to enhance their teaching. These behaviors indicate that learners move beyond the mechanical application of familiar teaching routines to the flexible application and ongoing development of professional knowledge. Research involving elementary science teachers illustrates this process: adaptive teachers make moment-to-moment instructional decisions, respond to learners' ideas and questions, and move flexibly between planned content and emerging classroom needs.

Empirical studies also provide support for implementing adaptive expertise in professional and instructional practice. Grunefeld et al. (2022) studied how adaptive expertise develops within a professional development program for educational leaders and reported that participants' perceptions of their learning were very high, but that performance-based measures indicated that there was not a significant amount of learning. This led them to conclude that purposeful practice and reflection are essential to developing adaptive expertise. Moran et al. (2023) researched a teacher-education model that includes STEM, computational thinking, professional development, and residency experiences, and reported the potential for authentic teaching experiences to lead to the development of adaptive expertise for preservice teachers. Meneses et al. (2023) concluded that professional practice sequences in teacher education that emphasized adaptive expertise led to improvements in prospective teachers' pedagogical reasoning and core teaching practices, highlighting the importance of professional practice and reasoning and reflection in teacher preparation. In a different learning setting, Jayawardena et al. (2024) reported a strong positive correlation between adaptive expertise and work performance of health professions educators, indicating that adaptive expertise is correlated with performance in conditions of change to work. Together, these findings support the theoretical proposition that professional effectiveness involves not only mastery of established practices but also the capacity to reason, learn, adjust, and innovate as circumstances change.

The theoretical framework that explains the proposed relationship between teachers' adaptive expertise and instructional effectiveness was drawn from Adaptive Expertise Theory. The study identified adaptive expertise as teachers' ability to be flexible, solve problems, be innovative, reflect on teaching, and engage in ongoing professional learning when faced with the demands of instruction. Instructional effectiveness was manifested as instructional planning and preparation, instructional delivery, classroom management, assessment and feedback, and learner engagement. In terms of the theory, teachers with higher adaptive capacity have more resources to draw on of their current knowledge of the profession and have more resources at their disposal to adjust their decisions and practices to when traditional methods are ineffective. The practices that can be seen in the way teachers plan instruction, deliver lessons, manage learning environments, respond to assessment information and engage learners can be considered as adaptation. Thus, Adaptive Expertise Theory provided the theoretical foundation for explaining why teachers' capacity to adapt, solve problems, innovate, reflect, and continually learn may be associated with their instructional effectiveness.

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II. RESEARCH METHODOLOGY

The study employed a quantitative descriptive-correlational research design to determine the relationship between teachers' adaptive expertise and instructional effectiveness in selected public elementary schools of Manukan II District, Schools Division of Zamboanga del Norte. The respondents were actively teaching public elementary school teachers who voluntarily participated in the study. Data were gathered using a researcher-made, expert-validated questionnaire consisting of 50 items covering five dimensions of adaptive expertise and five dimensions of instructional effectiveness, rated on a four-point Likert scale. Permission from school authorities and informed consent from respondents were obtained before administering the questionnaire. Voluntary participation, confidentiality, anonymity, and ethical handling of data were strictly observed. The collected data were analyzed using mean and standard deviation to determine the levels of both variables, while Pearson product-moment correlation was employed to test their significant relationship at the 0.05 level of significance.

III. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

Table 1.1 *Level of Teachers' Adaptive Expertise in Terms of Instructional Flexibility*

Indicators	SD	Mean
I adjust my teaching strategies when the planned approach does not work as expected.	0.55	3.29
I modify lesson activities based on situations that arise during instruction.	0.44	3.27
I use alternative teaching approaches when learners have difficulty understanding a lesson.	0.44	3.23
I adjust the pace of instruction according to learners' progress.	0.59	3.28
I modify instructional strategies, activities, or resources when changing classroom conditions require a different approach.	0.59	3.22
Aggregated Mean	3.26 (Very High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 1.1 presents the level of teachers' adaptive expertise in terms of instructional flexibility, with an aggregated mean of 3.26, interpreted as Very High. This indicates that the respondents consistently demonstrated flexibility in adjusting their instructional practices according to classroom conditions and learners' needs.

Among the indicators, adjusting teaching strategies when the planned approach did not work as expected obtained the highest mean of 3.29 (SD = 0.55). Conversely, modifying instructional strategies, activities, or resources when changing classroom conditions required a different approach recorded the lowest mean of 3.22 (SD = 0.59), interpreted as High. The remaining indicators obtained means ranging from 3.23 to 3.28, indicating generally favorable responses across the different aspects of instructional flexibility.

The findings indicate that teachers possessed a strong capacity to respond to instructional situations that required adjustments to their established teaching approaches. The highest-rated indicator suggests that respondents were particularly capable of recognizing when planned strategies were ineffective and making appropriate modifications to sustain instruction. Comparatively, the lowest indicator shows that teachers also exhibited positive practices with regard to adapting their instruction, activities, and resources to shifts in the classroom, but not at the highest levels. This difference implies that teachers were more successful at changing ineffective teaching strategies than at changing instruction that involved more than one teaching dimension. Nevertheless, the overall result reflects a well-established capacity for instructional flexibility, which is essential in addressing varying learner needs and classroom circumstances.

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The results align with Hatch and Clark (2021), which demonstrated that highly effective elementary teachers integrated aspects of teaching with flexible decision-making, and made changes in their instruction based on the learners' responses and situations that arose in the classroom. Similarly, Xiang et al. (2022) emphasized that adaptive teaching expertise is demonstrated through teachers' ability to modify instructional practices in response to changing teaching and learning conditions. These studies support the present finding that instructional flexibility is an important characteristic of teachers' adaptive expertise. The results imply that the respondents' strong instructional flexibility should be sustained through continued opportunities for responsive teaching, while further strengthening their capacity to adjust instructional resources and activities alongside teaching strategies when classroom conditions change.

Table 1.2 *Level of Teachers' Adaptive Expertise in Terms of Adaptive Problem-Solving*

Indicators	SD	Mean
I identify alternative solutions when instructional problems arise unexpectedly.	0.53	3.29
I analyze the causes of teaching difficulties before deciding how to address them.	0.48	3.36
I apply knowledge from previous teaching experiences to resolve new classroom challenges.	0.48	3.37
I change my approach when an initial solution to an instructional problem is ineffective.	0.50	3.35
I make appropriate instructional decisions when faced with unfamiliar classroom situations.	0.52	3.31
Aggregated Mean		3.34 (Very High)

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 1.2 illustrates the level of teachers' adaptive expertise in terms of adaptive problem-solving, with an aggregated mean of 3.34, interpreted as Very High. This indicates that the respondents consistently demonstrated strong problem-solving practices when addressing instructional difficulties and unfamiliar classroom situations. Among the indicators, applying knowledge from previous teaching experiences to resolve new classroom challenges obtained the highest mean of 3.37 (SD = 0.48). Meanwhile, identifying alternative solutions when instructional problems arose unexpectedly recorded the lowest mean of 3.29 (SD = 0.53). All five indicators received Very High ratings, with means ranging from 3.29 to 3.37, reflecting consistently favorable responses across the different aspects of adaptive problem-solving.

The findings indicate that teachers demonstrated a well-developed capacity to address instructional challenges through experience-based judgment, careful analysis, and appropriate adjustments to their teaching approaches. The highest-rated indicator suggests that respondents particularly relied on knowledge gained from previous teaching experiences when resolving new classroom difficulties, reflecting their ability to apply established professional knowledge to unfamiliar situations. Although identifying alternative solutions to unexpected instructional problems received the lowest mean, its Very High rating indicates that teachers also consistently demonstrated this practice. The relatively narrow differences among the indicator means further suggest that adaptive problem-solving was evident across the respondents' instructional practices, particularly in analyzing difficulties, reconsidering ineffective solutions, and making appropriate decisions when classroom challenges emerged.

The findings are consistent with Meneses et al. (2023), who emphasized that adaptive expertise develops through authentic teaching experiences and pedagogical reasoning that enable teachers to make informed instructional decisions. Similarly, Xiang et al. (2022) demonstrated that adaptive expertise involves responding to emerging instructional challenges through flexible decision-making and the

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application of professional knowledge. These studies support the present finding that teachers' adaptive problem-solving is characterized by their ability to draw from previous experiences while adjusting their approaches to unfamiliar teaching situations. The results imply that the respondents' strong problem-solving capacity should be sustained through opportunities to apply professional experience and sound instructional judgment, while further strengthening their ability to generate alternative solutions when unexpected classroom difficulties arise.

Table 1.3 *Level of Teachers' Adaptive Expertise in Terms of Innovation in Teaching*

Indicators	SD	Mean
I explore new approaches to improve the way I teach lessons.	0.57	3.26
I develop new ways of presenting lessons when established approaches do not adequately support learning.	0.58	3.33
I integrate appropriate new ideas into my teaching practices.	0.49	3.38
I experiment with different instructional approaches to determine what works for my learners.	0.32	3.11
I combine existing teaching ideas in new ways to address emerging instructional challenges.	0.48	3.36
Aggregated Mean	3.29 (Very High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 1.3 shows the level of teachers' adaptive expertise in terms of innovation in teaching, with an aggregated mean of 3.29, interpreted as Very High. This indicates that the respondents consistently demonstrated innovative practices in addressing instructional needs and challenges. Among the indicators, integrating appropriate new ideas into teaching practices obtained the highest mean of 3.38 (SD = 0.49), followed by combining existing teaching ideas in new ways to address emerging instructional challenges, with a mean of 3.36 (SD = 0.48). Conversely, experimenting with different instructional approaches to determine what works for learners recorded the lowest mean of 3.11 (SD = 0.32), interpreted as High. The remaining indicators obtained means of 3.26 and 3.33, both interpreted as Very High, reflecting a generally favorable pattern of instructional innovation.

The results showed that teachers' abilities were very strong in integrating new ideas and creating alternative teaching methods to meet the needs of students. The highest-rated indicator suggests that respondents were particularly consistent in integrating appropriate innovations into their existing teaching practices, reflecting their openness to adopting instructional ideas that could enhance learning experiences. In comparison, the comparatively low indicator reveals that the teachers also often tried out alternative ways of teaching but this was less frequently observed than the use of new ideas. This distinction indicates that respondents were more likely to integrate or incorporate instructional innovations than actively try to experiment to determine their appropriateness for learners. Overall, the rating of Very High demonstrates a good emphasis on teaching innovation and the willingness to deal creatively with challenges in teaching.

The results are similar to Liu, Lu, and Yin's (2022) study, which confirmed that professional learning communities had a positive relationship with teacher innovation, underscoring the significance of teacher collaboration and creative self-efficacy in building innovative teaching practice. Similarly, Santagata et al. (2024) found that changing instructional demands encouraged elementary teachers to explore new technologies and develop alternative teaching approaches, particularly when supported by opportunities for professional learning and collaboration. These studies support the present finding that instructional innovation involves both the integration of new ideas and the adaptation of existing practices to changing educational demands. The

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results imply that teachers' strong capacity to incorporate innovative teaching ideas should be sustained while providing greater opportunities for purposeful experimentation with instructional approaches to determine their suitability for different learners and classroom situations.

Table 1.4 *Level of Teachers' Adaptive Expertise in Terms of Reflective Practice*

Indicators	SD	Mean
I reflect on the effectiveness of my teaching after conducting a lesson.	0.46	3.30
I identify aspects of my teaching that need improvement.	0.48	3.22
I examine why certain teaching strategies succeed or fail.	0.47	3.28
I use insights from previous lessons to improve subsequent instruction.	0.49	3.32
I adjust my teaching practices based on what I learn from my classroom experiences.	0.34	3.13
Aggregated Mean	3.25 (High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 1.4 demonstrates the level of teachers' adaptive expertise in terms of reflective practice, with an aggregated mean of 3.25, interpreted as High. This indicates that the respondents frequently engaged in reflective practices to evaluate and improve their instruction. Among the indicators, using insights from previous lessons to improve subsequent instruction obtained the highest mean of 3.32 (SD = 0.49), interpreted as Very High.

Conversely, adjusting teaching practices based on learning gained from classroom experiences recorded the lowest mean of 3.13 (SD = 0.34), interpreted as High. The remaining indicators obtained means ranging from 3.22 to 3.30, reflecting favorable levels of reflection on instructional effectiveness, identification of areas for improvement, and examination of teaching strategies.

The results revealed that reflective practice was a significant part of the respondents' adaptive expertise, especially when looking at how they used their knowledge and understanding of what was learned in previous lessons to inform their planning and preparation for subsequent lessons.

The highest-rated indicator suggests that teachers consistently drew upon earlier teaching experiences to inform their succeeding lessons, demonstrating their capacity to recognize and utilize instructional insights. In the meantime, the lowest-rated indicator indicates that while teachers often modified their practices in response to classroom experiences, the translation of reflection into instructional changes was a more variable process.

This distinction suggests that teachers were more skilled at learning from past teaching than they were in systematically using the lessons they had learned in their teaching. Nevertheless, the High overall rating reflects a favorable level of reflective competence that supports teachers' continuous instructional development.

The results align with the research of Farrell and Macapinlac (2021), who noted that reflective practice can help teachers analyze their teaching experiences, beliefs, and decisions and improve their teaching knowledge. Likewise, Cirocki et al. (2024) have shown that reflective competence can be nurtured by a structured process of professional learning and that reflection is an important part of teachers' professional development.

These investigations complement the current study showing the effect of reflective practice on teachers' learning from instructional experiences and improving their teaching strategies. The results imply that the respondents' established reflective practices should be sustained while strengthening the consistent application of insights gained from classroom experiences to actual instructional adjustments, ensuring that reflection translates into meaningful improvements in teaching practice.

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Table 1.5 *Level of Teachers' Adaptive Expertise in Terms of Continuous Professional Learning*

Indicators	SD	Mean
I seek new knowledge that can help me respond to changing instructional demands.	0.55	3.30
I participate in professional learning activities that strengthen my teaching practices.	0.42	3.19
I apply relevant knowledge gained from training and professional development to my teaching.	0.61	3.27
I learn from colleagues' experiences and practices to improve my own instruction.	0.58	3.08
I independently seek resources that help me address unfamiliar teaching challenges.	0.62	3.14
Aggregated Mean	3.20 (High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 1.5 highlights the level of teachers' adaptive expertise in terms of continuous professional learning, with an aggregated mean of 3.20, interpreted as High. This reflects that respondents often participated in professional learning to enhance their instructional knowledge and skills. Among the indicators, seeking new knowledge to respond to changing instructional demands obtained the highest mean of 3.30 (SD = 0.55), interpreted as Very High. Conversely, learning from colleagues' experiences and practices to improve instruction recorded the lowest mean of 3.08 (SD = 0.58), interpreted as High. The remaining indicators obtained means ranging from 3.14 to 3.27, reflecting favorable engagement in professional development activities, application of acquired knowledge, and independent exploration of instructional resources.

The results showed that teachers were very receptive to lifelong learning, especially to learning new knowledge that would support them in meeting new teaching requirements.

The highest-rated indicator suggests that respondents actively recognized the importance of expanding their professional knowledge to remain responsive to evolving classroom conditions. The relatively lowest indicator shows that experiencing and learning from other people's experiences and instructional processes was less often observed than seeking new knowledge on their own. Although this practice remained at a High level, the difference suggests that respondents relied more consistently on their personal pursuit of professional knowledge than on collegial learning opportunities.

However, overall, it illustrates a positive attitude towards professional learning, in which teachers want to enhance their skills and continue to use appropriate teaching methods.

The results align with Benedict et al. (2023), who highlighted how opportunities for professional learning enable teachers to expand their pedagogical knowledge and practices by reflecting on how to teach and relate new knowledge to classroom experiences. Likewise, Liu, Lu, and Yin (2022) determined that professional learning communities were positively linked to teacher innovation, which underscores the importance of teacher collaboration in supporting the development of instruction.

These studies support the present finding that continuous professional learning is an important component of teachers' adaptive expertise.

The findings suggest that teachers' proven dedication to learning and using professional knowledge needs to be maintained, and that opportunities for collegial learning, instructional sharing, and group professional development should be expanded to enhance and deepen what is already a less common practice, that is, learning from colleagues' experiences.

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Table 2 *Summary of the Level of Teachers' Adaptive Expertise*

Variables	Mean	Interpretation
Instructional Flexibility	3.26	Very High
Adaptive Problem-Solving	3.34	Very High
Innovation in Teaching	3.29	Very High
Reflective Practice	3.25	High
Continuous Professional Learning	3.20	High
Aggregated Mean	3.27	Very High

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 2 presents the summary of the level of teachers' adaptive expertise, with an aggregated mean of 3.27, interpreted as Very High. The highest mean was adaptive problem-solving (3.34) followed by innovation in teaching (3.29), and instructional flexibility (3.26), which were all on the level of Very High, out of the five dimensions. Meanwhile, reflective practice registered a mean of 3.25, interpreted as High, while continuous professional learning obtained the lowest mean of 3.20, likewise interpreted as High. These results indicate that the respondents demonstrated a generally very high level of adaptive expertise, particularly in addressing instructional challenges, introducing innovative teaching approaches, and adjusting instruction to changing classroom conditions.

The results indicated teachers' high-level of adaptive skills that allowed them to react to different instructional demands appropriately. The highest score on adaptive problem solving suggested that respondents could analyze classroom problems, make use of past experiences and find suitable solutions to classroom problems. The relatively low rating of continuous professional learning, however, indicates that while teachers often participated in activities designed to enhance their professional capabilities, such participation was not as consistent as was adaptive problem solving. Similarly, the High rating in reflective practice indicates opportunities to strengthen the systematic application of insights gained from teaching experiences. Overall, the findings depict a positive growth of adaptive expertise with potential for additional enhancement in professional learning and reflective teaching practices.

The results are consistent with the findings of Pelgrim et al. (2022), who argued that adaptive expertise is the capacity to flexibly, problem-solve, reflect on, and continuously learn from new workplace situations. Likewise, Suh et al. (2023) emphasized the relevance of adaptive teaching competence in helping teachers make suitable instructional adjustments when faced with the complexity of classroom demands.

Furthermore, Benedict et al. (2023) underscored the contribution of continuous professional learning to teachers' pedagogical development and instructional improvement. These studies support the present finding that adaptive expertise encompasses interconnected competencies essential for responding to changing educational demands. The results imply that maintaining teachers' established strengths in adaptive problem-solving, innovation, and instructional flexibility, while strengthening reflective practice and continuous professional learning, may contribute to a more balanced development of their adaptive expertise.

Table 3.1 *Level of Teachers' Instructional Effectiveness in Terms of Instructional Planning and Preparation*

Indicators	SD	Mean
I establish clear and appropriate learning objectives for my lessons.	0.51	3.40
I organize lesson content in a logical and understandable sequence.	0.48	3.30
I prepare learning activities that are aligned with the intended learning objectives.	0.47	3.34
I select instructional materials appropriate to the lesson and learners.	0.50	3.37

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I plan assessment activities that correspond with the intended learning outcomes.	0.50	3.30
Aggregated Mean	3.34 (Very High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Table 3.1 demonstrates the level of teachers' instructional effectiveness in terms of instructional planning and preparation, with an aggregated mean of 3.34, interpreted as Very High. The highest mean value among the indicators was for establishing clear and appropriate learning objectives (3.40, SD = 0.51), followed by selecting instructional materials appropriate to learners and lesson (3.37, SD = 0.50). Conversely, organizing lesson content in a logical and understandable sequence and planning assessment activities aligned with intended learning outcomes recorded the lowest mean of 3.30, with standard deviations of 0.48 and 0.50, respectively. The ratings for all five indicators were Very High, which means that respondents' practices of instructional planning and preparation were consistently good.

The findings indicate that teachers demonstrated well-established competencies in preparing purposeful and organized instruction. The most highly rated indicator indicated that the respondents took the time to set clear learning goals and give direction to the learning activities and expected outcomes. The strong rating in selecting appropriate instructional materials further reflects their ability to consider lesson requirements and learners' needs during preparation. Meanwhile, the comparatively lower ratings in organizing lesson content and planning corresponding assessment activities suggest that these practices, although consistently demonstrated, received slightly less emphasis than establishing objectives and selecting instructional resources. However, the overall impression is of a good ability of teachers to plan instruction with suitable learning objectives, activities, materials and assessment plans.

The findings are consistent with Hatch and Clark (2021), who emphasized that effective elementary teachers carefully considered learning objectives, instructional resources, assessment information, and learners' needs when preparing lessons. The same is true of Koberstein-Schwarz and Meisert (2022), who emphasized the significance of pedagogical content knowledge for lesson planning in choosing appropriate instructional materials and predicting student knowledge. In addition, Ndihokubwayo et al. (2022) emphasized the importance of systematically structuring the learning goals, learning activities, teaching materials, and assessment elements in a coherent way so that the lesson can be prepared. These studies support the present finding that effective instructional planning involves the purposeful alignment of essential teaching components. The findings suggest that teachers' competence in setting learning objectives and choosing materials should be maintained, while their ability to structure the material for lessons and to link assessment tasks with learning objectives should be enhanced.

Table 3.2 *Level of Teachers' Instructional Effectiveness in Terms of Instructional Delivery*

Indicators	SD	Mean
I explain lesson content clearly and accurately.	0.42	3.17
I use teaching strategies appropriate to the objectives of the lesson.	0.54	3.38
I provide relevant examples to help learners understand difficult concepts.	0.47	3.14
I present lessons in an organized manner that learners can follow.	0.54	3.20
I provide clear and understandable directions for classroom tasks and learning activities.	0.60	3.33
Aggregated Mean	3.25 (High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

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As reflected in Table 3.2, the level of teachers' instructional effectiveness in terms of instructional delivery obtained an aggregated mean of 3.25, interpreted as High. The highest mean of 3.38 (SD = 0.54) was recorded for using teaching strategies appropriate to the objectives of the lesson, followed by providing clear and understandable directions for classroom tasks and learning activities, with a mean of 3.33 (SD = 0.60), both interpreted as Very High. In contrast, providing relevant examples to help learners understand difficult concepts registered the lowest mean of 3.14 (SD = 0.47), interpreted as High. The remaining indicators, presenting lessons in an organized manner and explaining lesson content clearly and accurately, obtained means of 3.20 and 3.17, respectively, both interpreted as High. These results demonstrate that teachers frequently exhibited effective instructional delivery practices, particularly in selecting appropriate teaching strategies and communicating classroom directions.

The findings indicated that respondents had a great level of competence in applying instructional strategies in accordance with learning objectives. Their clarity about which instructional methods align with the purpose of their lessons is reflected in the highest indicator, and they tend to focus on instructional alignment when implementing instruction in their classroom. Similarly, the positive rating in the area of giving clear directions indicated that teachers were able to consistently make clear expectations in learning activities. However, the comparatively lowest rating in providing relevant examples indicates that explaining difficult concepts through appropriate illustrations was less consistently practiced. This indicated that the teacher could do more to improve their explanations and use of concrete examples to make learning easier for their students, as they are good at choosing teaching methods. Overall, the findings indicate good instructional delivery and adequate use of purposeful teaching strategies, with opportunities to improve the clarity and accessibility of the lessons.

This is similar to what Hatch and Clark (2021) noted about the use of appropriate instructional strategy and making adjustments based on learners' responses and classroom condition, which is observed in the finding of this study. Meneses et al. (2023) highlighted that effective teaching practices are dependent on the integration of pedagogical knowledge, pedagogical reasoning, and practical teaching experiences. Their findings highlight the importance of selecting and implementing instructional approaches that respond appropriately to learners' needs. These studies reinforce the present finding that instructional delivery involves more than selecting suitable teaching strategies; it also requires clear explanations, meaningful examples, and organized presentation of lesson content. Accordingly, the results imply that teachers should sustain their strong practices in instructional alignment and communication of classroom directions while further refining their ability to explain complex concepts through relevant examples and logically organized instruction.

Table 3.3 *Level of Teachers' Instructional Effectiveness in Terms of Classroom Management*

Indicators	SD	Mean
I establish clear expectations for appropriate classroom behavior.	0.51	3.30
I manage classroom routines efficiently.	0.58	3.20
I maintain an environment conducive to teaching and learning.	0.47	3.28
I address disruptive behavior appropriately without unnecessarily interrupting instruction.	0.61	3.25
I manage instructional time effectively.	0.61	3.20
Aggregated Mean	3.24 (High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

The assessment of teachers' instructional effectiveness in terms of classroom management, as detailed in Table 3.3, yielded an aggregated mean of 3.24, interpreted as High. Establishing clear expectations for

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appropriate classroom behavior obtained the highest mean of 3.30 (SD = 0.51), followed by maintaining an environment conducive to teaching and learning, with a mean of 3.28 (SD = 0.47), both interpreted as Very High. Meanwhile, managing classroom routines efficiently and managing instructional time effectively recorded the lowest mean of 3.20, with standard deviations of 0.58 and 0.61, respectively. Addressing disruptive behavior appropriately without unnecessarily interrupting instruction registered a mean of 3.25 (SD = 0.61), interpreted as High. The results indicated that the respondents' classroom management practice was good, especially with setting classroom behavior expectations and creating a supportive learning environment.

The findings show that teachers place a high priority on discipline and providing an environment conducive to effective teaching. The best rating indicates that the expectations for behaviors were communicated consistently by the respondents, potentially helping to establish a regulated dynamic within the classroom and proper behavior for pupils. Likewise, the positive assessment of maintaining conducive learning environments suggests their ability to create learning environments in the classrooms that are conducive to productive teaching and learning. The comparatively low ratings for classroom routines and instructional time management, however, indicate that these aspects of classroom management were less consistently implemented. This distinction suggests that the teachers' effectiveness in setting up classroom norms and ensuring appropriate learning environments is higher than their effectiveness in maximizing the instructional time and managing the daily classroom routines. Nevertheless, the overall High rating signifies a satisfactory level of classroom management competence, with opportunities to strengthen organizational efficiency during instruction.

These findings are consistent with the previously mentioned studies by Liu et al. (2023), who noted that effective classroom management requires setting clear expectations, building positive teacher–student relationships, and creating learning environments that promote meaningful participation in school. Their study pointed to the need for consistency, respect, and expectations of appropriate behavior, within the classroom, to create positive interactions. Similarly, Poulou et al. (2023) emphasized the importance of systematic feedback and professional development to enhance teachers' instructional and behavioral management practices. These studies reinforce the present finding that classroom management encompasses both maintaining appropriate learner behavior and organizing classroom processes to facilitate instruction. The results imply that teachers should sustain their established practices in setting behavioral expectations and maintaining conducive learning environments while giving greater attention to improving classroom routines and instructional time management to strengthen overall classroom management effectiveness.

Table 3.4 *Level of Teachers' Instructional Effectiveness in Terms of Assessment and Feedback*

Indicators	SD	Mean
I use assessment activities that measure the intended learning outcomes.	0.63	3.36
I monitor learners' understanding throughout the lesson.	0.65	3.36
I provide timely feedback on learners' performance.	0.64	3.31
I provide feedback that helps learners understand how they can improve.	0.62	3.35
I use assessment results to determine areas where learners need additional support.	0.61	3.34
Aggregated Mean	3.35 (Very High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Assessment and feedback emerged as a highly demonstrated dimension of teachers' instructional effectiveness, as evidenced by the aggregated mean of 3.35, interpreted as Very High, in Table 3.4. The highest mean of 3.36 was shared by using assessment activities that measure intended learning outcomes

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(SD = 0.63) and monitoring learners' understanding throughout the lesson (SD = 0.65). Providing feedback that helps learners understand how they can improve followed closely, with a mean of 3.35 (SD = 0.62), while utilizing assessment results to identify learners requiring additional support obtained a mean of 3.34 (SD = 0.61). Providing timely feedback on learners' performance registered the lowest mean of 3.31 (SD = 0.64). All indicators were interpreted as Very High, demonstrating consistently strong assessment and feedback practices among the respondents.

The results demonstrate teachers' capabilities in using assessment within teaching to track learning progress and pinpoint the learning needs. The equally highest ratings suggest that respondents placed considerable importance on ensuring that assessment activities corresponded with intended learning outcomes while continuously monitoring learners' understanding during instruction. This is an indication of their ability to collect data to provide information on student performance and identify developing learning challenges. Although providing timely feedback received the lowest mean, its Very High interpretation indicates that respondents consistently demonstrated this practice, albeit slightly less frequently than other assessment activities. This distinction indicates that teachers were especially good at measuring and monitoring learning, and that they need to further develop the communication of assessment feedback. Taken together, the results demonstrate a well-established assessment and feedback competence that supports informed instructional decisions and appropriate learner assistance.

The results are in line with the studies by Lui and Andrade (2022) who noted that formative feedback gains significance when the students are given meaning and use it to decide what steps they can then take forward for improvement. Likewise, Gan et al. (2021) found that purposeful feedback practices were related to the responses of the learners to feedback, their satisfaction with the course and the aspects of their academic achievement, highlighting the relevance of purposeful feedback in the learning process. Moreover, Guo and Zhou (2021) pointed out that the effects of teacher feedback on learners' motivation were found to differ across feedback types, indicating that the way feedback was presented is a crucial aspect of teaching and learning as well. These studies substantiate the importance of assessment and feedback as interconnected processes that enable teachers to monitor learning and guide subsequent instructional decisions. Accordingly, the findings imply that respondents' strong practices in assessment alignment, continuous monitoring, and constructive feedback should be maintained, with additional attention to ensuring that learners receive timely information about their performance and areas requiring improvement.

Table 3.5 *Level of Teachers' Instructional Effectiveness in Terms of Learner Engagement*

Indicators	SD	Mean
I encourage learners to participate actively in classroom activities.	0.54	3.36
I provide opportunities for learners to express their ideas during lessons.	0.52	3.31
I use activities that encourage learners to interact meaningfully with lesson content.	0.48	3.31
I encourage learners to ask questions and seek clarification.	0.54	3.28
I provide opportunities for learners to make choices and assume responsibility for aspects of their learning.	0.56	3.27
Aggregated Mean	3.31 (Very High)	

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

Learner engagement constitutes another important dimension of instructional effectiveness, with Table 3.5 revealing an aggregated mean of 3.31, interpreted as Very High. Encouraging learners to participate actively in classroom activities obtained the highest mean of 3.36 (SD = 0.54), followed by providing opportunities for learners to express their ideas during lessons and using activities that promote meaningful

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interaction with lesson content, both registering a mean of 3.31, with standard deviations of 0.52 and 0.48, respectively. Encouraging learners to ask questions and seek clarification recorded a mean of 3.28 (SD = 0.54), while providing opportunities for learners to make choices and assume responsibility for aspects of their learning obtained the lowest mean of 3.27 (SD = 0.56). All indicators received Very High ratings, reflecting consistently favorable teaching practices that encourage active learner participation and involvement in classroom activities.

The findings show that respondents gave special attention to the opportunities to enable learners to actively engage with the learning process. The highest-rated indicator suggests that teachers were particularly consistent in encouraging active classroom participation, reflecting their commitment to involving learners in instructional activities rather than limiting them to passive reception of information. Similarly, the positive ratings for offering opportunities for the expression of ideas and engaging with lessons content support that respondents often engaged in participatory strategies during lessons. However, the comparatively lowest rating in allowing learners to make choices and assume responsibility for their learning suggests that opportunities for learner autonomy were slightly less emphasized than teacher-initiated participation. This practice was at Very High level but the difference suggests that teachers were more successful in promoting participation than in giving learners more autonomy in how they take charge of their learning. Overall, the findings demonstrate a high level of participatory pedagogy, and learner autonomy and responsibility could be further developed.

Consistent with these findings, Cents-Boonstra et al. (2021) reported that encouraging teaching behaviours (i.e., asking meaningful questions, giving positive feedback, and offering instructional support) were related to higher student engagement. Their results highlight the significance of teachers' pedagogical actions on stimulating students' active involvement in learning activities at school. Likewise, Thomas and Nair (2023) emphasized the role of teachers in fostering student engagement by implementing strategies that create opportunities for meaningful participation and learning involvement. In addition, Zhang (2022) highlighted that collaborative pedagogies and teacher feedback are significant factors in facilitating students' involvement in the learning process.

The present study confirms the above observation that the engagement of learners is related to teachers' attempts to create participatory and supportive learning contexts that have been supported by these studies. The results suggest that the respondents should maintain their high levels of practice in encouraging classroom participation and meaningful interaction, and also increase opportunities for students to be independent, make appropriate learning choices and take responsibility for their learning.

Table 4 *Summary of the Level of Teachers' Instructional Effectiveness*

Variables	Mean	Interpretation
Instructional Planning and Preparation	3.34	Very High
Instructional Delivery	3.25	High
Classroom Management	3.24	High
Assessment and Feedback	3.35	Very High
Learner Engagement	3.31	Very High
Aggregated Mean	3.30	Very High

Scale: 3.26–4.00 = Very High; 2.51–3.25 = High; 1.76–2.50 = Low; 1.00–1.75 = Very Low

An overall assessment of teachers' instructional effectiveness, summarized in Table 4, revealed an aggregated mean of 3.30, interpreted as Very High. Assessment and feedback received the highest mean of 3.35 (Very High), followed by instructional planning and preparation (3.34) and learner engagement (3.31) (Very High). In comparison, instructional delivery registered a mean of 3.25, interpreted as High, while

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classroom management recorded the lowest mean of 3.24, likewise interpreted as High. These results demonstrate that respondents exhibited a generally very high level of instructional effectiveness, with particular strengths in assessing learning progress, preparing instructional activities, and promoting learner participation.

The results indicated that teachers were well known for exhibiting competencies related to monitoring learners' understanding, connecting instructional activities to learning objectives, and getting learners to actively participate in the classroom. The highest rating in assessment and feedback reflects the respondents' strong emphasis on evaluating learning progress and providing information that supports instructional improvement. Similarly, the positive ratings on instructional planning and learner engagement reflect their ability to plan effective learning activities and prompt student engagement. However, the comparatively lower ratings in classroom management and instructional delivery suggest that maintaining efficient classroom routines, managing instructional time, and presenting lesson content effectively were practiced less consistently than other instructional dimensions. This pattern suggested that teachers displayed significant skill in planning, assessment and learner engagement, but there was scope to further enhance the way classroom instruction was implemented and managed to increase consistency of effectiveness in all areas.

The results find support in Hatch and Clark (2021), who emphasized that effective elementary teaching involves purposeful instructional preparation, appropriate teaching strategies, and responsiveness to learners' needs. Likewise, Ndihokubwayo et al. (2022) emphasized that instruction goals, learning activities, learning resources, and assessment should be aligned to encourage systematic lesson preparation. In the context of classroom management, Liu et al. (2023) highlighted the importance of effective classroom management in fostering supportive classroom learning environments, and Cents-Boonstra et al. (2021) showed that the teaching behaviors and supportive instructional interactions were correlated with positive student engagement.

These studies further support the present finding that instructional effectiveness is interwoven skills of planning, teaching, classroom management, assessment and learner participation. The results imply that sustaining teachers' established strengths in assessment, instructional preparation, and learner engagement, alongside targeted improvements in classroom management and instructional delivery, may promote greater consistency and effectiveness in their overall teaching practices.

Table 5 *Test of Significant Relationship between Teachers' Adaptive Expertise and Instructional Effectiveness*

Test Variables	Correlation Coefficient	p value	Decision
Teachers' Adaptive Expertise and Instructional Effectiveness	0.641	<0.001	Reject H_0

Note: If $p \leq 0.05$, there is a significant relationship.

The relationship between teachers' adaptive expertise and instructional effectiveness was examined using Pearson Product-Moment Correlation, as shown in Table 5. The analysis yielded a correlation coefficient of 0.641 and a p-value of less than 0.001, indicating a statistically significant positive relationship between the two variables. Since the p-value was below the 0.05 level of significance, the null hypothesis was rejected. The correlation coefficient further indicates a moderately strong positive association, suggesting that teachers who demonstrated higher levels of adaptive expertise also tended to exhibit greater instructional effectiveness.

This finding provides evidence that teachers' ability to adjust their teaching style is significantly correlated with their ability to implement teaching responsibilities. Specifically, teachers who demonstrated greater instructional flexibility, adaptive problem-solving, innovation in teaching, reflective practice, and continuous professional learning tended to report stronger practices in instructional planning and preparation, instructional delivery, classroom

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management, assessment and feedback, and learner engagement. The positive correlation indicates that adaptive expertise is a key professional skill that is correlated with effective classroom instruction. Teachers with higher adaptive capacities may be more suited to addressing the instruction-related challenges, modifying the teaching tasks based on learner needs, and sustaining effective classroom instruction with different classroom situations.

The result is supported by Suh et al. (2023), who emphasized that adaptive teaching expertise involves teachers' capacity to respond to complex instructional situations through flexible decision-making, attention to learners' needs, and appropriate use of professional knowledge. Similarly, Meneses et al. (2023) identified the role of adaptive expertise in deepening pedagogical reasoning and basic teaching strategies, showing the relationship between adaptive professional competencies and teaching practice. Moreover, Hatch and Clark (2021) reported that high-quality elementary educators used flexible teaching strategies and made informed decisions in their classrooms. The present study's finding that adaptive expertise is related positively to instruction is corroborated by these studies. The findings suggest that enhancing teachers' adaptive competences by providing them with the opportunities to engage in professional development that is focused on relevant issues and to reflect on their practices as well as to innovate their instruction could support their continued development and improvement in their instructional effectiveness.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the findings of the study, it is concluded that teachers' adaptive expertise is an essential professional capacity associated with effective instructional practice. Teachers who demonstrate greater flexibility, sound instructional judgment, and openness to innovation tend to exhibit stronger instructional effectiveness. However, adaptive competence extends beyond responding to immediate classroom challenges, as reflective practice and continuous professional learning remain important areas for further development. Likewise, effective instruction requires not only purposeful planning, assessment, and learner engagement but also consistent instructional delivery and efficient classroom management. The significant positive relationship between the two variables establishes that teachers' capacity to adapt to changing instructional demands is closely associated with the effectiveness of their teaching practices. Thus, adaptive expertise and instructional effectiveness are interconnected dimensions of professional teaching competence that warrant sustained development to support responsive and effective classroom instruction.

Recommendations

School administrators may strengthen professional development initiatives through mentoring, peer observations, collaborative planning, and Learning Action Cell (LAC) sessions. Teachers are encouraged to sustain their adaptive teaching competencies while enhancing reflective practice, instructional delivery, and classroom management. Learners may actively engage in classroom activities and provide constructive feedback to support instructional improvement. Department of Education (DepEd) officials may develop targeted capacity-building programs supported by regular monitoring and evaluation. Future researchers may explore similar studies involving larger samples and diverse educational settings using mixed-methods or longitudinal approaches to gain further insights into the relationship between teachers' adaptive expertise and instructional effectiveness.

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ISSN: 2582-6832

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