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National Book Development Board (NBDB) Registration
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PRC-CPD Accredited Provider: PTR-2025-749

SEC Registration No.: 2024020137294-00

Sta. Ana, Pampanga, Philippines



iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577

The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Website: <https://etcor.org>

Adaptive Teaching Pedagogies and Pupils' Learning Styles

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Received: 13 May 2025

Revised: 16 September 2025

Accepted: 28 October 2025

Available Online: 29 October 2025

Volume IV (2025), Issue 4, P-ISSN – 2984-7567; E-ISSN - 2945-3577

<https://doi.org/10.63498/etcor493>

Abstract

Aim: This study examined the relationship between adaptive teaching pedagogies and pupils' learning styles, focusing on curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication in the classroom.

Methodology: Using a descriptive correlational design, the study involved elementary teachers in the Second District of Eastern Samar. Data were gathered through validated survey instruments to determine the extent of teachers' adaptive practices and pupils' dominant learning styles—visual, auditory, reading/writing, and kinesthetic.

Results: Findings revealed that teachers consistently apply adaptive strategies that promote flexibility, inclusivity, and engagement. Curriculum planning enables lesson differentiation, while targeted support nurtures a positive learning environment. Pre-teaching vocabulary enhances comprehension, formative assessment supports continuous improvement, and effective communication fosters clarity and participation. The integration of multiple learning styles was found to reinforce comprehension and active engagement.

Conclusion: Adaptive teaching pedagogies show a significant correlation with pupils' learning styles, though the strength of influence varies. The study recommends continuous professional development and pedagogical refinement to sustain inclusive and effective instruction. Further research should explore additional factors influencing adaptive practices and student outcomes.

Keywords: *adaptive teaching, learning styles, instructional strategies, inclusive education*

INTRODUCTION

In the evolving landscape of global education, adaptive teaching has emerged as a transformative approach that responds to the growing diversity of learners and the rapid integration of technology in classrooms. Internationally, the emphasis on learner-centered and inclusive education has intensified, driven by UNESCO's Sustainable Development Goal 4, which advocates for quality and equitable education for all learners regardless of background or ability (UNESCO, 2023). Adaptive teaching—defined as the ability to modify instruction based on learners' needs, readiness, and progress—has become a key strategy for achieving these goals. It integrates data analytics, formative assessment, and differentiated support to ensure that each learner attains mastery of shared competencies (Noon, 2024).

In the Philippine context, the Department of Education (DepEd) continues to strengthen inclusive education and differentiated instruction under the K–12 curriculum reforms. However, many teachers still face challenges in addressing diverse learning styles and needs, particularly in public elementary schools where class sizes are large and resources are limited. The shift to hybrid and digital learning during and after the COVID-19 pandemic further emphasized the importance of adaptive pedagogies that combine flexibility, equity, and learner engagement (Hawthorne, 2023). These realities underscore the relevance of studying adaptive teaching as a mechanism for improving instructional delivery and ensuring that no learner is left behind.

Although adaptive teaching has been widely studied in Western and urban educational settings, limited research in the Philippine context—particularly in Eastern Samar—has examined how teachers' adaptive pedagogies align with pupils' learning styles. Previous studies have explored differentiated instruction or learner-centered strategies but have not adequately established how adaptive teaching practices correlate with visual, auditory, reading/writing, and kinesthetic learning styles (Main, 2023; Woffindin, 2023). This research addresses that gap by

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The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

examining adaptive teaching pedagogies and their relationship with pupils' learning styles among elementary teachers in the Second District of Eastern Samar.

Anchored on Kolb's Experiential Learning Theory and Vygotsky's Constructivist Learning Theory, the study assumes that effective learning occurs when teaching strategies are dynamically aligned with learners' preferred modes of understanding and interaction. By investigating how adaptive pedagogies influence or correspond with various learning styles, this study contributes to the growing body of knowledge on inclusive and responsive education. It also provides empirical evidence that may guide teachers, school administrators, and policymakers in designing professional development programs and adaptive curricula responsive to learner diversity.

Statement of the Problem

Despite ongoing efforts to implement inclusive and differentiated instruction, many teachers continue to struggle in aligning their pedagogical strategies with pupils' diverse learning styles. This gap often leads to unequal learning opportunities, inconsistent engagement, and variations in achievement across learners. Adaptive teaching, which emphasizes flexibility and responsiveness in instruction, is designed to address these challenges. However, limited studies in the Philippine context, particularly in Eastern Samar, have examined how adaptive teaching pedagogies relate to pupils' learning styles. Thus, this study investigates the relationship between teachers' adaptive teaching practices—specifically in curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication—and pupils' visual, auditory, reading/writing, and kinesthetic learning preferences during School Year 2024–2025.

Research Objectives

This study aimed to determine the relationship between adaptive teaching pedagogies and pupils' learning styles. Specifically, it sought:

1. To determine the adaptive teaching pedagogies of teachers in terms of:
 - 1.1 curriculum planning,
 - 1.2 targeted support,
 - 1.3 pre-teaching vocabulary,
 - 1.4 formative assessment, and
 - 1.5 effective communication.
2. To identify the pupils' learning styles in terms of:
 - 2.1 visual,
 - 2.2 auditory,
 - 2.3 reading/writing preference, and
 - 2.4 kinesthetic.
3. To examine the significant relationship between adaptive teaching pedagogies of teachers and pupils' learning styles.

Research Questions

1. What are the adaptive teaching pedagogies of teachers in terms of curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication?
2. What are the pupils' learning styles in terms of visual, auditory, reading/writing, and kinesthetic preferences?
3. Is there a significant relationship between adaptive teaching pedagogies of teachers and pupils' learning styles?

Hypothesis

There is no significant relationship between adaptive teaching pedagogies and pupils' learning styles.

METHODS

Research Design

The study utilized a descriptive-correlational research design, which was appropriate for determining the relationship between teachers' adaptive teaching pedagogies and pupils' learning styles. This design allowed the researcher to describe existing conditions without manipulating the variables and to analyze the degree and direction



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of the relationship between them. It was considered the most suitable design since the study sought to describe current teaching practices and learning style preferences as they naturally occur in the school setting (Magalona & Manzano, 2024). The design enabled the study to identify possible associations between adaptive pedagogical approaches and learners' diverse learning styles without experimental intervention.

Population and Sampling

The population of the study consisted of 677 elementary teachers from the central elementary schools of the Second District of the Division of Eastern Samar during School Year 2024–2025. These teachers were chosen because they represent the population that directly implements adaptive teaching pedagogies in the classroom. Using Slovin's formula with a 0.05 margin of error, a total of 252 respondents were determined as the appropriate sample size. The study employed simple random sampling, ensuring that every teacher had an equal chance of being selected, thereby reducing sampling bias. This technique helped obtain a representative sample that accurately reflected the diversity of teaching experiences and learning contexts within the district. The use of random sampling allowed the results to be generalizable to the broader DepEd curricular context, providing a sound basis for correlation analysis.

Instrument

The study used a structured survey questionnaire as the primary data-gathering instrument. The instrument was adapted and modified from the works of Hardy et al. (2022) and Stetson University (n.d.), particularly the items that measured adaptive teaching strategies and learning styles. Minimal modifications were made to ensure that the items fit the local context of the study while maintaining the essence of the original constructs.

The questionnaire was composed of two parts: Part I described the adaptive teaching strategies of teachers in terms of curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication; Part II identified pupils' learning styles, specifically visual, auditory, reading/writing, and kinesthetic. Each construct was measured through a five-point Likert scale, ranging from 5 – *Strongly Agree* to 1 – *Strongly Disagree*.

The adapted instrument underwent content validation by three experts in education and research to ensure clarity, relevance, and contextual appropriateness of the items. The validators were research faculty members with at least five years of teaching and research experience. The validated questionnaire was pilot-tested among 30 teachers from a neighboring district, resulting in a Cronbach's alpha reliability coefficient of 0.87, which indicated high internal consistency and reliability of the instrument.

Data Collection Procedure

Prior to the actual data gathering, formal communication letters were sent to the Schools Division Superintendent of Eastern Samar, school administrators, and teacher-advisers to secure permission for the conduct of the study. Upon approval, the validated questionnaires were personally administered to the respondents across the selected central elementary schools. The researcher explained the study's purpose and instructions for accomplishing the questionnaire to ensure accurate and complete responses. The data collection process was conducted over a two-to-three-week period, considering the wide geographic scope of the Second District. The retrieved questionnaires were organized and tabulated for analysis. All responses were treated objectively to maintain the accuracy and integrity of the data collected.

Data Analysis

The data collected from the respondents were tabulated and statistically analyzed to determine the association between adaptive teaching pedagogies and pupils' learning styles. Four statistical tools were employed in this investigation: frequency counts, weighted mean, and Pearson Product-Moment Correlation (Pearson's r).

- Frequency counts were used to summarize and describe the demographic distribution of the respondents and categorical variables.
- Weighted mean was applied to determine the teachers' level of practice of adaptive teaching pedagogies and the pupils' dominant learning styles.
- Pearson's r was utilized to test the significant relationship between the adaptive teaching pedagogies of teachers and pupils' learning styles.



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To ensure accuracy and efficiency in analysis, data were encoded into spreadsheets using Microsoft Excel and processed through Statistical Package for the Social Sciences (SPSS) software. All statistical analyses were conducted at a 0.05 level of significance, and results were interpreted according to established correlation strength parameters.

Ethical Considerations

The study strictly observed ethical principles in research involving human participants. Voluntary participation was ensured by informing the respondents about the study's objectives, procedures, potential risks, and benefits. Written informed consent was obtained prior to participation. Confidentiality and anonymity were maintained by coding all questionnaires and excluding any personally identifiable information. All collected data were securely stored in password-protected digital files accessible only to the researcher.

The researchers ensured that no participant experienced harm, discomfort, or undue stress during the conduct of the study. Fairness and equity were observed in the selection of respondents, and bias or discrimination was avoided. The integrity and transparency of the research were maintained throughout the process, including accurate representation of findings and acknowledgment of sources. As emphasized by Manzano (2023), ethical research upholds the participants' safety and rights by ensuring informed consent, voluntary participation, and confidentiality. Similarly, "to ensure the safety and rights of the possible participants, informed consent, voluntary participation, rights of participants, anonymity, and confidentiality were considered" (Chigona et al., 2010 as cited in Manzano, 2023, p. 150).

RESULTS and DISCUSSION

This section presents the findings on the relationship between adaptive teaching strategies and pupils' learning styles. The results are organized according to the study's research questions, with corresponding discussions immediately following each result for coherence.

Adaptive Teaching Strategies

Table 1 presents the results on adaptive teaching strategies in terms of curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication. The computed grand mean of 4.75 indicates that teachers "always" practiced these strategies.

Table 1. *Adaptive Teaching Strategies*

| Adaptive Teaching Strategies | Mean | Interpretation |
|------------------------------|-------------|----------------|
| 1. Curriculum planning | 4.76 | Always |
| 2. Targeted support | 4.71 | Always |
| 3. Pre-Teaching Vocabulary | 4.71 | Always |
| 4. Formative assessment | 4.80 | Always |
| 5. Effective communication | 4.76 | Always |
| GRAND MEAN | 4.75 | Always |

The findings reveal that curriculum planning obtained the highest mean of 4.76, suggesting that teachers consistently designed lessons with flexibility to accommodate learners' diverse needs. This aligns with the findings of Woffindin (2023), who emphasized that adaptive lesson planning enhances inclusivity and learner engagement. Targeted support, with a mean of 4.71, also showed consistent application, indicating that teachers prioritized individualized interventions and continuous assessment to address learning gaps. This supports Hawthorne (2023), who found that adaptive teaching nurtures equitable learning environments.

Pre-teaching vocabulary likewise obtained a mean of 4.71, emphasizing that teachers proactively strengthened pupils' foundational comprehension through key terminology exposure, as suggested by Noon (2024), who identified vocabulary scaffolding as a core adaptive practice. The highest mean of 4.80 in formative assessment indicates that teachers routinely monitored pupil progress and provided feedback for improvement. Effective communication, with a mean of 4.76, reflects a sustained effort to maintain clarity, motivation, and rapport in the classroom. Overall, the data show that adaptive pedagogies are regularly integrated into classroom instruction, fostering inclusivity and engagement.



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Table 2. Responses of the respondents on learning style

| Learnig Style | Mean | Interpretation |
|-------------------|-------------|----------------|
| 1. Visual | 4.80 | Always |
| 2. Auditory | 4.73 | Always |
| 3. Preference | 4.73 | Always |
| 4. Kinesthetic | 4.76 | Always |
| GRAND MEAN | 4.75 | Always |

Table 2 shows a grand mean of 4.75, indicating that all four learning styles were frequently accommodated in instruction. Visual learning styles obtained the highest mean of 4.80, suggesting teachers regularly used visual aids, multimedia tools, and graphic organizers to reinforce comprehension. This finding corroborates Main (2023), who emphasized that visual integration enhances retention and engagement. Auditory and reading/writing styles both achieved means of 4.73, reflecting the effective use of verbal explanations, note-taking, and written reflections. Kinesthetic learning, with a mean of 4.76, demonstrates teachers' commitment to interactive and experiential activities, which encourage deeper understanding and motivation.

Table 3. Relationship between adaptive teaching strategies and learning

| Variable 1 | Variable 2 | Correlation coefficient | Interpretation | P-value | Interpretation |
|---|--------------------|-------------------------|----------------------|---------|--------------------|
| Curriculum Planning Targeted Support | Learning Styles | .352 | Low Correlation | .000 | Highly Significant |
| | | .388 | Moderate Correlation | .000 | Highly Significant |
| Pre-Teaching Vocabulary | | .488 | Low Correlation | .000 | Highly Significant |
| Formative Assessments | | .413 | Moderate Correlation | .000 | Highly Significant |
| Effective Communication | | .398 | Low Correlation | .000 | Highly Significant |

As presented in Table 3, curriculum planning ($r = .352$, $p = .000$) showed a low but significant correlation with learning styles, indicating that adaptive lesson design contributes meaningfully to learning diversity. Targeted support ($r = .388$, $p = .000$) exhibited a moderate positive correlation, implying that structured interventions positively influence pupils' engagement and achievement. Similarly, pre-teaching vocabulary ($r = .488$, $p = .000$) yielded a moderate correlation, underscoring its role in promoting comprehension and retention. Formative assessment ($r = .413$, $p = .000$) also indicated a moderate positive relationship, supporting continuous feedback as vital in shaping effective learning experiences. Effective communication ($r = .398$, $p = .000$) revealed a low but significant correlation, emphasizing that clear teacher-pupil interactions foster inclusivity and motivation.

Collectively, these results affirm that adaptive teaching strategies are significantly related to learning styles, though with varying degrees of influence. These findings align with the studies of Woffindin (2023) and Hawthorne (2023), which both emphasized that responsiveness and communication within adaptive teaching enhance student learning outcomes. The null hypothesis was therefore not accepted, confirming that adaptive teaching pedagogies significantly correlate with pupils' learning styles.

Conclusion

The study concluded that adaptive teaching pedagogies—specifically curriculum planning, targeted support, pre-teaching vocabulary, formative assessment, and effective communication—had significant correlations with pupils' learning styles. The relationships ranged from low to moderate, suggesting that while adaptive strategies influence learning outcomes, other variables may also contribute. The highly significant p-values affirmed the validity of these relationships. The results highlighted the importance of refining adaptive approaches to accommodate visual, auditory, reading/writing, and kinesthetic learners, fostering inclusivity and engagement in classroom instruction.

Recommendations

Based on the findings of the study, the following recommendations are offered:



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1. For Pupils: They may engage actively with various learning styles—visual, auditory, reading/writing, and kinesthetic—to identify approaches that best support their academic growth. They may also seek assistance from teachers and utilize available resources to enhance learning outcomes.
2. For Teachers: They may continue integrating adaptive teaching pedagogies, particularly in curriculum planning, targeted support, and formative assessment, while exploring differentiated and technology-assisted approaches to sustain learner engagement.
3. For School Principals: They may initiate and support professional development programs that enhance teachers' competence in adaptive instruction and provide necessary materials to strengthen inclusive classroom practices.
4. For Future Researchers: They may examine other factors influencing learning styles, such as motivation, socio-economic status, and classroom environment. Future studies may also expand to other grade levels and districts to broaden understanding of adaptive teaching's impact on learning outcomes.

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