Enhancing capability of teachers in addressing visual. auditory, reading/writing, kinesthetic, and multimodal types of learners

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Abstract

This study aimed to enhance teachers' capability in addressing the needs of visual, auditory, reading/writing, kinesthetic learners, and multimodal learners at School A and School B. Specifically, it sought to identify the learning styles of Grades 4–6 learners, determine the instructional strategies used by teachers; find out if there is a significant difference between learning styles and instructional strategies; assess the effectiveness of these strategies as perceived by teachers; examine the relationship between instructional strategies and their effectiveness; identify challenges in addressing diverse learning styles; and propose interventions to improve teacher capability. Findings revealed that kinesthetic learners were the most common, with visual learners the least. Lectures were frequently used for auditory learners and role-playing for kinesthetic learners, while field trips and podcasts were least applied. Although no significant difference was found between learning styles and instructional strategies, multimedia presentations, and hands-on experiments were rated highly effective for visual and kinesthetic learners. Significant positive relationships were found between instructional strategies and their effectiveness—except visual strategies. Time constraints emerged as the most frequent challenge in implementing differentiated instruction. The study proposed the development of an instructional strategies handbook designed to guide teachers in planning and implementing effective, learner-centered approaches. Recommendations include increasing kinesthetic-based strategies, integrating underutilized methods such as podcasts and field trips, and providing training on differentiated instruction and time management to support inclusive education

Keywords: Visual, auditory; reading/writing; kinesthetic; multimodal; learning styles; instructional strategies; learning preferences

1. Introduction

Within the complex framework of the classroom, the true essence of education blossoms when every learner is empowered to understand, engage, and feel inspired to explore the realms of knowledge. This essence is realized when educators create an inclusive environment where all students, regardless of their individual differences, are equipped to learn and grow (Tomlinson, 2001). Understanding each student's unique learning style is important (Gardner, 1993). These learning styles, ranging from visual cues to auditory prompts, reading/writing preferences, and kinesthetic experiences, serve as distinct avenues through which students absorb and process information (Dunn & Dunn, 1978).

The influence of these varied learning styles on the dynamics within the classroom is essential. When educators align their teaching methodologies with students' preferred learning styles, motivation and academic performance are increased. On the contrary, neglecting these diverse styles can lead to disengagement and

hindered progress (Kolb, 1984). Many studies consistently highlight the benefits of tailoring teaching methods to accommodate these diverse learning styles. Approaches that integrate visual, auditory, reading/writing, and kinesthetic elements into lessons have shown positive results, fostering increased engagement, deeper understanding, and enhanced academic achievement among students.

Within the context of Mercedes Elementary School and San Roque Elementary School, where a diverse student body meets, lies a perfect ground to explore the practical application of strategies catering to visual, auditory, reading/writing, and kinesthetic learners. Understanding the dynamics of this unique educational setting serves as an environment for investigating inclusive teaching practices.

Despite consistent research findings showcasing the impact of catering to diverse learning styles on student engagement and academic success, a tangible gap persists in understanding the practical implementation of these strategies within real classroom settings. This study aimed to bridge this gap by looking into how teachers at Mercedes Elementary School and San Roque Elementary School can enhance their capabilities to effectively address the needs of visual, auditory, reading/writing, and kinesthetic learners.

However, the classroom implementation of strategies tailored to diverse learning styles presents both challenges and opportunities (Llego, 2022). While acknowledging the importance of inclusivity, teachers face limitations such as time constraints, large class sizes, and varying resources. DepEd Order No. 035, s. 2016 highlights the need for professional learning communities, such as the Learning Action Cell (LAC), where teachers can collaborate, share best practices, and engage in continuous professional development to refine their instructional strategies (DepEd, 2016). Overcoming these challenges allows educators to leverage their collective knowledge and experiences to address the diverse needs of learners more effectively.

By exploring effective teaching methodologies and interventions, this study aimed to provide actionable insights that foster a more inclusive and effective learning environment at Mercedes Elementary School, San Roque Elementary School, and potentially in broader educational contexts.

2. METHODS

This study employed a quantitative method and utilized descriptive-correlational design to explore how teachers address the diverse learning styles of visual, auditory, reading/writing, kinesthetic, and multimodal learners at School A and School B. This methodological choice allowed for a thorough investigation by integrating quantitative data collection and analysis methods.

The descriptive component addressed the learning styles of intermediate learners (Grades 4-6) in School A and School B, instructional strategies employed by intermediate teachers in School A and School B to accommodate the learning preferences of visual, auditory, reading/writing, kinesthetic, and multimodal learners, the level of effectiveness of the instructional strategies as perceived by the teacher-respondents, and problems teachers encounter in addressing the diverse learning styles of their students. This analysis provided a comprehensive overview of the learning styles of intermediate learners, the instructional strategies utilized by teachers, the perceived effectiveness of those strategies, and the challenges faced in practice. The information gathered helped establish a baseline understanding of classroom practices and needs.

The inferential component examined if there is a significant difference between learning styles and instructional strategies. This aspect allowed the study to make generalizations regarding the differences between learning styles and the instructional strategies employed by teachers. Inferential statistics was also used to test the formulated hypotheses, providing insights into the relationships and differences outlined in the research questions.

The correlational aspect examined if there is a significant relationship between instructional strategies and their effectiveness. This analysis explored the relationship between the instructional strategies employed and their perceived effectiveness. The findings helped determine whether specific teaching approaches align with learners' preferences and influence learning outcomes.

3. RESULTS AND DISCUSSION

3.1. The Learning Styles of Learners in School A and School B

Table 1 shows the learning styles among intermediate learners at School A and School B. It can be gleaned from the data that the highest percentage of the respondents are kinesthetic learners, with 37.96% at School A and 26.42% at School B, with a total of 34.74%.

Table 1. Learning Styles of Intermediate Learners in School A and School B

Learning Styles	School A		School B		Total	%
	F	%	F	%	F	
Visual learners	15	10.95	6	11.32	21	11.05
Auditory learners	16	11.68	11	20.75	27	14.21
Reading/writing learners	33	24.09	13	24.53	46	24.21
Kinesthetic learners	52	37.96	14	26.42	66	34.74
Multimodal learners	21	15.33	9	16.98	30	15.79
Total	137	100.00	53	100.00	190	100.00

This implies that learners prefer physical activities like hands-on and tactile activities, role-play, and simulations. Also, more learners would benefit from teaching methods involving physical engagement. These findings conform with Bualat et al. (2023) and Kadam et al. (2021), who also identified kinesthetic learners as the most prevalent group, underscoring the alignment between these learning preferences and using kinesthetic-based teaching strategies in educational settings.

On the other hand, visual learners are the smallest group at both School A and School B, with percentages of 10.95% and 11.32%, respectively, totaling only 11.05% overall. This entails a lower preference for visual learning in these schools. It further implies that visual-based instructional methods would directly address the needs of a smaller percentage of learners in these schools. This corroborates with the findings of Černá (2023), who found that the least predominant learners exhibited a visual learning style.

This further implies that learners prefer hands-on, experiential learning approaches among the learners. This entails a tendency toward engaging in activities involving physical movement and interaction, as opposed to relying heavily on visual materials. This concurs with the findings of Gola and Singh (2019) that reinforce the importance of implementing active learning strategies that cater to kinesthetic preferences to enhance educational outcomes. They also found that kinesthetic learning styles were more prevalent among secondary school learners and positively correlated with academic achievement. As the famous saying by Confucius goes, "What I hear, I forget; what I see, I remember; what I do, I learn," emphasizing the importance of active engagement for a more meaningful learning experience.

3.2. Instructional Strategies Employed by Intermediate Teachers

The following tables show the instructional strategies teachers at School A and School B employed to address visual learning styles, showing their utilization across both schools.

Visual. Among the instructional strategies employed for visual learning style, "utilizing multimedia presentations" with a weighted mean of 3.95 and "demonstrating with charts" with a weighted mean of 4.05, both interpreted as "Often employed," are the most frequently employed in School A, while "utilizing multimedia presentations" is the most frequently employed in School B with a weighted mean of 5.00 interpreted as "Always employed." With the two schools combined, "utilizing multimedia presentations" is the most frequently employed, with a weighted mean of 4.48, interpreted as "Always employed." The frequent use

of multimedia presentations implies that teachers prioritize engaging learners through dynamic and interactive content and that this instructional strategy effectively engages visual learners. This concurs with Feklistova and Tiik (2023), who states that more than half of Estonian secondary school teachers frequently incorporate multimedia presentations and materials in their lessons, often or almost every lesson. Their research highlights that the primary reasons for this frequent use include making lessons more engaging and stimulating student interest through visually appealing content.

On the other hand, the least employed strategy across both schools is "presenting animated visuals," with a weighted mean of 1.90 interpreted as "Rarely employed" at School A and 4.00 interpreted as "Often employed" at School B, resulting in an overall weighted mean of 2.95 interpreted as "Sometimes employed." The low utilization of animated visuals implies that this strategy is not frequently integrated into classroom practices at these schools. This is contrary to the findings of Rosmiati et al. (2020) that animated visuals are frequently used in many classrooms to maximize interaction between teachers and learners. Their study highlights the effectiveness of animations in fostering engagement and interaction, which contrasts with the limited use observed in the current study.

These findings further suggest that multimedia presentations are frequently employed in both schools, serving as an effective engagement strategy for visual learners. However, the low utilization of animated visuals reflects a limitation in instructional practices. Thus, educators should consider diversifying their instructional methods to include more animated content, which has been shown to enhance motivation and participation among learners. This conforms with the findings of Raimi et al. (2024), highlighting the need for varied instructional methods to accommodate different learning styles to enhance engagement, retention, and preparation for learners.

Table 2. Visual Strategies Employed by Intermediate Teachers

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Visual						
a. Demonstrating with Charts	4.05	OE	4.33	AE	4.19	OE
b. Drawing Diagrams	3.48	OE	4.08	OE	3.78	OE
c. Creating Mind Maps	2.08	RE	4.17	OE	3.12	RE
d. Using Flowcharts	2.73	SE	4.58	AE	3.66	SE
e. Presenting Infographics	2.00	RE	4.42	AE	3.21	RE
f. Displaying Photographs	3.95	OE	4.92	AE	4.44	OE
g. Showing Illustrative Images	3.28	SE	4.17	OE	3.73	OE
h. Presenting Animated Visuals	1.90	RE	4.00	OE	2.95	SE
i. Utilizing Multimedia Presentations	3.95	OE	5.00	AE	4.48	OE

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Always employed (AE)
3.40 – 4.19	Often employed (OE)
2.60 – 3.39	Sometimes employed (SE)
1.80 – 2.59	Rarely employed (RE)
1.00 – 1.79	Never employed (NE)

Auditory. Table 3 shows the instructional strategies employed by teachers at School A and School B to address auditory learning styles, showing their utilization across both schools.

Among the instructional strategies employed for auditory learning style, the most frequently employed at both School A and School B is "delivering lectures," with both weighted means of 4.75 interpreted as "Always employed" and an overall weighted mean of 4.75 interpreted as "Always employed." This implies a reliance on traditional teaching methods, which are often seen as effective for delivering structured information. This refutes the findings of Alaagib et al. (2019) that although traditional lectures can convey factual content, they may not be as effective as more interactive methods. They suggest that while traditional lectures are commonly used, more interactive, problem-based methods may be more effective in improving learning outcomes for auditory learners.

On the other hand, the least utilized strategy for auditory learning style at School A is "using podcast" and "organizing panel discussions," with both weighted means of 1.00 interpreted as "Never employed," while in School B, it is "using podcast" with a weighted mean of 3.58 interpreted as "Often employed." When combined, "using podcast" is the least utilized, with a weighted mean of 2.29, interpreted as "Rarely employed." The low utilization of this strategy implies that teachers are either unfamiliar with or not trained in using these strategies effectively. This conforms with Andrade and Paredes (2021) that podcast is a resource that belongs to the group of the least used tools in virtual learning environments, despite their potential to enhance student engagement and performance through interactive feedback. Their study highlighted the benefits of integrating podcasts, which significantly improved student outcomes when used effectively.

The reliance on lectures further implies a traditional approach to teaching, but teachers should explore other auditory instructional strategies, such as podcasts, to create a more engaging and student-centered learning environment. Kumari et al. (2023) also suggest that educators should adopt varied methods tailored to learners' diverse needs, enhancing the overall learning experience.

Table 3. Auditory Strategies Employed by Intermediate Teachers

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Auditory						
a. Delivering Lectures	4.75	AE	4.75	AE	4.75	AE
b. Conducting Socratic Dialogues	2.68	SE	4.42	AE	3.55	SE
c. Engaging in Group Discussions	3.00	SE	4.58	AE	3.79	SE
d. Holding Debates	2.15	RE	4.33	AE	3.24	SE
e. Providing Verbal Explanations	3.98	OE	4.58	AE	4.27	OE
f. Using Podcasts	1.00	NE	3.58	OE	2.29	RE
g. Organizing Panel Discussions	1.00	NE	4.17	OE	2.59	NE
h. Conducting Oral Recitations	4.00	OE	4.25	AE	4.13	OE
i. Engaging in Verbal Storytelling	3.15	SE	4.67	AE	3.91	OE

Rating Scale   Descriptive Interpretation
4.20 – 5.00   Always employed (AE)
3.40 – 4.19   Often employed (OE)
2.60 – 3.39   Sometimes employed (SE)
1.81   – 2.59   Rarely employed (RE)
1.00 – 1.79   Never employed (NE)

<u>Reading/Writing.</u> Table 4 shows the instructional strategies employed by teachers at School A and School B to address reading/writing learning style, showing their utilization across both schools.

Among the strategies employed for reading and writing learning style, the most frequently employed

in School A is "using writing prompts" and "assigning written tasks," with weighted means of 4.53 and 4.50, respectively, both interpreted as "Always employed"; while "assigning written tasks" is the most frequently employed in School B with a weighted mean of 4.83 interpreted as "Always employed." Overall, "assigning written tasks" is the most frequently employed for the two schools combined with a weighted mean of 4.67, interpreted as "Always employed." This implies that both schools recognize the significance of written tasks in promoting literacy skills. This refutes the findings of Håland et al. (2019) that the use of written tasks in Norwegian classrooms was limited, with 19% of teachers not allowing learners to write their texts. This limited utilization was attributed to prioritizing reading-skill tasks overwriting, a sequential view of literacy development where reading comes before writing, and a lack of pedagogical knowledge on implementing writing practices effectively.

On the other hand, among the strategies employed for reading and writing learning style, the least employed are "conducting literature circles" and "facilitating books clubs," with both weighted means of 1.00 interpreted as "Never employed" in School A, while "assigning research tasks," "conducting literature circles," and "facilitating books clubs" are the least employed at School B with same weighted means of 3.92 interpreted as "Often employed." When combined, "conducting literature circles" and "facilitating books clubs" are the least employed, with an overall weighted mean of 2.46, interpreted as "Rarely employed." This entails limited engagement with these strategies in the instructional practices of both schools. Thus, this limited use indicates a lack of emphasis on collaborative learning experiences to enhance reading and writing skills, as both book clubs and literature circles serve similar functions by promoting discussion, interpretation, and deeper understanding of texts among peers. This finding conforms with Moran (2023) that despite the potential of book clubs to enrich learning experiences, they are not frequently utilized in classrooms because of rigid instructional policies, the Science of Reading movement, and time constraints. This lack of frequency hinders student engagement and classroom community-building opportunities.

This further implies that while the emphasis on written tasks is important for literacy development, incorporating strategies that encourage deeper engagement—such as literature circles and book clubs—can further enhance learners' understanding and skills. By integrating these approaches, educators can foster independent learning and critical thinking, thus helping learners become more thoughtful and analytical. Balancing both types of activities may lead to a more comprehensive educational experience that prepares learners for complex problem-solving and analytical reasoning in their academic and personal lives. Similarly, Kirani and Savitri (2023) highlight that combining different teaching strategies fosters a more comprehensive learning experience, especially when tailored to learners' needs.

Table 4. Reading/Writing Strategies Employed by Intermediate Teachers

Instructional Strategies	School A		School B		Overall	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Reading/Writing						
a. Assigning Written Tasks	4.50	AE	4.83	AE	4.67	AE
b. Providing Reading Assignments	4.33	AE	4.50	AE	4.42	AE
c. Facilitating Guided Reading	3.95	OE	4.75	AE	4.35	OE
d. Encouraging Journal Writing	2.45	RE	4.08	OE	3.27	SE
e. Assigning Research Papers	1.03	NE	3.92	OE	2.48	NE
f. Using Writing Prompts	4.53	AE	4.08	OE	4.31	AE
g. Engaging in Peer Editing	2.65	SE	4.17	OE	3.41	SE

h. Conducting Literature Circles	1.00	NE	3.92	OE	2.46	RE
i. Facilitating Book Clubs	1.00	NE	3.92	OE	2.46	RE

Rating Scale   **Descriptive Interpretation**
4.20 – 5.00   Always employed (AE)
3.40 – 4.19   Often employed (OE)
2.60 – 3.39   Sometimes employed (SE)
1.82 – 2.59   Rarely employed (RE)
1.00 – 1.79   Never employed (NE)

<u>Kinesthetic</u>. Table 5 shows the instructional strategies employed by teachers at School A and School B to address kinesthetic learning styles, showing their utilization across both schools.

Among the strategies employed for kinesthetic learning style, the most frequently employed at both School A and School B is "organizing role-playing activities," with weighted means of 4.30 and 4.58, respectively, both interpreted as "Always employed," and an overall weighted mean of 4.44 interpreted as "Always employed. This implies focusing on methods that actively involve learners in the learning process. This conforms with Edgar (2023) that role-playing was one of the most utilized simulation modalities in advanced practice provider education, emphasizing its effectiveness in developing critical communication skills. In addition, Obielodan et al. (2023) noted that role-playing, although moderately utilized in basic technology teaching, remains a valuable strategy for promoting engagement and participation in learning.

On the other hand, among the strategies employed for kinesthetic learning style, the least frequently employed at both School A and School B is "conducting field trips," with weighted means of 1.33 interpreted as "Never employed" and 2.08 interpreted as "Rarely employed," respectively, and an overall weighted mean of 1.71 interpreted as "Never employed." This implies a significantly lower utilization of field trips, reflecting a lack of emphasis on experiential, out-of-classroom learning. The legal basis for conducting field trips in the Philippines is outlined in DO 56, s. 2001 – Policy on Educational Field Trips and DO 51, s. 2002 – Guidelines on the Conduct of Educational Field Trips. These orders provide comprehensive requisites and guidelines for implementing educational field trips, emphasizing their importance in enhancing learning experiences. However, the low frequency of such activities in these schools suggests challenges in meeting these requirements, including safety protocols, planning logistics, and securing approvals. This conforms with Appolinus et al. (2021), who observed similar barriers in their study of field trips, noting that despite the motivational and interactive benefits, lack of nearby industries, time constraints, transportation costs, and logistical issues often limit their use.

Table 5. Kinesthetic Strategies Employed by Intermediate Teachers

	School A		School B		Overall	
Instructional Strategies	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Kinesthetic						
a. Conducting Hands-on Experiments	3.90	OE	4.42	AE	4.16	OE
b. Organizing Role-Playing Activities	4.30	AE	4.58	AE	4.44	AO
c. Using Simulations	3.63	OE	4.00	OE	3.82	OE
d. Implementing Interactive Whiteboard Activities	1.43	NE	3.08	SE	2.26	RE
e. Implementing Sensory Activities	3.30	SE	3.67	OE	3.49	SE
f. Conducting Field Trips	1.33	NE	2.08	RE	1.71	NE
g. Engaging in Physical Demonstrations	3.68	OE	4.17	OE	3.93	OE
h. Using Tactile Learning	3.00	SE	4.00	OE		SE

Materials				3.50	

This further implies that educational effectiveness for kinesthetic learners is not solely dependent on the strategy's nature but also on its application's practicality. Schools may prefer cost-effective, easily organized strategies like role-playing, which can be implemented consistently, over more complex ones like field trips that, despite their benefits, face significant operational constraints. Therefore, schools should carefully balance instructional impact with feasibility when planning kinesthetic learning activities. Likewise, Westmoreland et al. (2019) demonstrated that role-playing is a low-cost and effective method for enhancing competency and confidence, underscoring its practicality as an educational strategy.

Multimodal. Table 6   shows the instructional strategies employed by teachers at School A and School B to address multimodal learning styles, showing their utilization across both schools.

Lastly, among the strategies employed for multimodal learning style, the most frequently employed at School A is "developing interactive multimedia presentations," with a weighted mean of 3.80, and "utilizing role-playing and simulation games," with a weighted mean of 3.70, both interpreted as "Often employed," while "utilizing role-playing and simulation games" and "designing flexible learning spaces" with both weighted means of 4.58 both interpreted as "Always employed" are the most frequently employed at School B. Overall, "utilizing role-playing and simulation games" is the most frequently employed across the two schools with a weighted mean of 4.14 interpreted as "Often employed." This data entails both schools' recognition of the value of these strategies in promoting active, experiential learning through dynamic, real-world scenarios that foster decision-making and problem-solving. This is contrary to the findings of Nazarov (2023) that despite the known benefits, role-playing and simulation games are less frequently used by some educators, who are hesitant to implement these methods due to challenges in incorporating them effectively into lessons.

Table 6. Multimodal Strategies Employed by Intermediate Teachers

Instructional Strategies	School A		School B		Overall	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Multimodal						
a. Implementing Project-Based Learning	3.58	OE	4.08	OE	3.83	OE
b. Developing Interactive Multimedia Presentations	3.80	OE	4.08	OE	3.94	OE
c. Facilitating Socratic Seminars	2.48	RE	3.58	OE	3.03	SE
d. Setting up Learning Stations	2.45	RE	3.83	OE	3.14	SE
e. Creating Concept Maps	3.15	SE	4.17	OE	3.66	SE
f. Utilizing Role-Playing and Simulation Games	3.70	OE	4.58	AE	4.14	OE
g. Designing Flexible Learning Spaces	2.48	RE	4.58	AE	3.53	SE
h. Promoting Peer Tutoring	3.18	SE	4.42	AE	3.80	OE

On the other hand, among the strategies employed, the least employed strategies in School A are "facilitating Socratic seminars" and "designing flexible learning spaces," with the same weighted means of 2.48, both interpreted as "Rarely employed" and "setting up learning stations" with a weighted mean of 2.45 which is also interpreted as "Rarely employed," while at School B "facilitating Socratic seminars" is the least employed with a weighted mean of 3.58 interpreted as "Often employed." Overall, "facilitating Socratic seminars" is the least, with a weighted mean of 3.03, interpreted as "Sometimes employed." This implies that these methods are less frequently integrated into classroom practice. This refutes the findings of Winkels (2024) that Socratic seminars are frequently used by teachers, particularly for assessment purposes, depending on their experience. This suggests that while Socratic seminars are not used in some contexts, they are recognized as a valuable tool in others, especially in promoting active student participation and assessment.

This contrast implies that while experiential strategies like role-playing and simulation games are used, other valuable approaches like Socratic seminars remain underutilized, pointing to potential opportunities for professional development to broaden the use of diverse instructional strategies. Tremblay-Wragg et al. (2021) found that diversified teaching strategies contribute to learners' learning motivation, highlighting the importance of balancing various approaches for more engaging and enriching learning experiences. Moreover, fostering a balanced mix of instructional strategies can enhance not only student engagement but also long-term retention and critical thinking skills, ensuring a more comprehensive educational experience.

3.3. Difference Between Learning styles and Instructional Strategies

Table 7 shows the difference between learning styles and instructional strategies among respondents from School A, School B, and the total combined group. The table provides chi-square values, degrees of freedom, critical values, and conclusions for each group, showing that there is no significant difference between learning styles and instructional strategies.

For School A, the chi-square value is 12.47 with 8 degrees of freedom, below the critical value of 15.51, while School B shows a chi-square value of 1.13 with 4 degrees of freedom, under the critical value of 9.49. When combined, the groups have a chi-square value of 8.20 with 12 degrees of freedom, also below the critical value of 21.03. The null hypothesis (Ho) is not rejected in all cases, indicating no significant difference between learning styles and instructional strategies. This result implies that instructional strategies are not adapted based on learners' learning styles, and instead, a uniform or standardized teaching approach is applied across the schools studied.

Table 7. Difference Between Learning Styles and Instructional Strategies

Respondent School	N	df	X^2	Critical Value	Conclusion
School A	137	8	21 12.47	15.51	Failed to reject Ho
School B	53	4	1.13	9.49	Failed to reject Ho
Total Respondents	190	12	8.20	21.03	Failed to reject Ho

This refutes the findings of Kadam et al. (2021) that tailoring teaching methods to individual learning styles enhanced student performance. This is also contrary to the findings of Balgan et al. (2022) who identified improvements in student engagement and academic performance when differentiated instruction based on learning styles was implemented in STEM education. While these studies highlight the effectiveness of personalized instructional strategies, the findings in the current study reflect a consistent approach to teaching, regardless of diverse learning preferences.

3.4. Level of Effectiveness of Instructional Strategy as Perceived by Teacher-respondents

The following tables provide data on the perceived effectiveness of visual instructional strategies, as evaluated by teacher-respondents from both School A and School B. These ratings reflect the extent to which educators view each strategy as effective in fostering student learning and engagement.

Visual. The most highly effective instructional strategy for visual learning style is "utilizing multimedia presentations" with a weighted mean of 5.00 at School A and 4.75 at School B both interpreted as "Highly effective", thus, results with an overall weighted mean of 4.88 interpreted as "Highly effective". This entails that both schools perceive multimedia presentations as highly effective for enhancing student engagement and performance. These findings conform with Samat and Aziz (2020) that multimedia enhances comprehension by combining different media elements, making learning more interactive and accessible.

On the other hand, the least effective instructional strategy for visual learners is "presenting infographics" with a weighted mean of 3.20 at School A and 4.17 at School B both interpreted as "Effective", which results in an overall weighted mean of 3.69 also interpreted as "Effective. The data implies that infographics are viewed as moderately effective in supporting deep learning. This corroborates with the findings of Tarkhova et al. (2020) that although infographics can improve information comprehension and retention, their effectiveness depends on careful creation and appropriate use. The study also emphasizes that mastering infographic design and its application can improve learning outcomes by 20-25%, underscoring the importance of training in this area. information comprehension and retention, their effectiveness depends on careful creation and appropriate use.

The overall data further entails a strong preference for multimedia-based strategies, which are perceived as highly effective for engaging learners, while simpler visual tools like infographics are viewed as moderately effective. This reflects a broader trend in education toward technology-enhanced learning. Similarly, Baneres et al. (2020) highlight that technology-enhanced learning like multimedia facilitates new learning methodologies, enabling learners to build knowledge and competencies through interactive technologies.

Table 8. Level of Effectiveness of Visual Instructional Strategies

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Visual						
a. Demonstrating with Charts	4.33	HE	4.67	HE	4.50	HE
b. Drawing Diagrams	4.55	HE	4.58	HE	4.57	HE
c. Creating Mind Maps	4.45	HE	4.25	HE	4.35	HE
d. Using Flowcharts	4.45	HE	4.42	HE	4.44	HE
e. Presenting Infographics	3.20	ME	4.17	E	3.69	E
f. Displaying Photographs	4.56	HE	4.50	HE	4.53	HE
g. Showing Illustrative Images	4.70	HE	4.75	HE	4.73	HE
h. Presenting Animated Visuals	4.70	HE	4.75	HE	4.73	HE
i. Utilizing Multimedia Presentations	5.00	HE	4.75	HE	4.88	HE

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Highly Effective (HE)
3.40 – 4.19	Effective (E)
2.60 – 3.39	Moderately Effective (ME)
1.80 – 2.59	Slightly Effective (SE)
1.00 – 1.79	Not Effective (NE)

Auditory. Table 9 provides data on the perceived effectiveness of auditory instructional strategies, as

evaluated by teacher-respondents from both School A and School B. These ratings reflect the extent to which educators view each strategy as effective in fostering student learning and engagement.

The most highly effective instructional strategy for auditory learning style in School A is "engaging in group discussions", with a weighted mean of 4.93 interpreted as "Highly effective" while "delivering lectures" and "engaging in verbal storytelling" in School B with both weighted means of 4.75 also both interpreted as "Highly effective". When combined, "engaging in group discussions" is the most highly effective with overall weighted mean of 4.72 interpreted as "Highly effective". This data entails the importance placed on collaborative learning environments that promote dialogue and interaction among learners. The effectiveness of group discussions suggests that this approach plays a significant role in enhancing learners' comprehension, critical thinking, and communication skills. This conforms with the findings of Yang (2023) that highlights the positive impact of group discussions in student-centered classrooms, noting their benefits for academic achievement, social skills, and student confidence, as they provide opportunities for learners to engage deeply with the material and gain new insights.

Moreover, the least effective instructional strategy for auditory learners is "using podcasts" and "organizing panel discussions" with weighted means of 2.78 and 2.73 respectively both interpreted as "Moderately effective" at School A, while "using podcasts" is the least effective at School B with a weighted mean of 3.83 interpreted as "Moderately effective". When combined, "using podcasts" in the least effective with an overall weighted mean of 3.31 interpreted as "Moderately effective". This implies that podcasts are viewed as moderately effective compared to more interactive auditory methods like discussions. This refutes the findings of Tarmawan et al. (2021) that podcasts can serve as an alternative learning medium, providing varied and innovative content delivery. They note that podcasts offer a time-efficient and accessible platform for distributing educational materials, emphasizing their potential to enhance learning when integrated effectively into instructional strategies.

Table 9. Level of Effectiveness of Auditory Instructional Strategies

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Auditory						
a. Delivering Lectures	4.00	E	4.75	HE	4.38	E
b. Conducting Socratic Dialogues	3.88	E	4.58	HE	4.23	E
c. Engaging in Group Discussions	4.93	HE	4.50	HE	4.72	HE
d. Holding Debates	3.55	E	4.42	HE	3.99	E
e. Providing Verbal Explanations	3.98	E	4.50	HE	4.24	E
f. Using Podcasts	2.78	ME	3.83	E	3.31	ME
g. Organizing Panel Discussions	2.73	ME	4.25	HE	3.49	ME
h. Conducting Oral Recitations	3.63	E	4.33	HE	3.98	E
i. Engaging in Verbal Storytelling	3.13	ME	4.75	HE	3.94	E

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Highly Effective (HE)
3.40 – 4.19	Effective (E)
2.60 – 3.39	Moderately Effective (ME)
1.80 – 2.59	Slightly Effective (SE)
1.00 – 1.79	Not Effective (NE)

The data suggests a preference for interactive auditory methods like group discussions, which are valued for fostering student engagement and critical thinking, while passive strategies like podcasts are viewed as less effective. However, Andersen and Dau (2021) found that podcasts can still be valuable in learning contexts when used appropriately. Their review of podcasts as a learning medium in higher education found that they offer flexibility, accessibility, and the ability to revisit content, contributing to knowledge retention. This highlights that while interactive strategies are favored, passive methods like podcasts should be recognized for their potential to complement active learning when integrated thoughtfully.

Reading/Writing. Table 10 provides data on the perceived effectiveness of reading/writing

instructional strategies, as evaluated by teacher-respondents from both School A and School B. These ratings reflect the extent to which educators view each strategy as effective in fostering student learning and engagement.

The most highly effective instructional strategies for reading/writing learning style at School A is "assigning written tasks" with a weighted mean of 4.13 interpreted as "Effective" while in School B it is "providing reading assignments" with a weighted mean of 4.75 interpreted as "Highly effective". When combined "providing reading assignments" is the most highly effective with an overall weighted mean of 4.38 interpreted as "Highly effective". This data entails that these strategies enhance student engagement and comprehension. This conforms with Abid et al. (2023) that strong reading habits and study skills are positively correlated with academic achievement, emphasizing that tasks such as reading and writing assignments significantly enhance comprehension and retention. These findings reinforce the effectiveness of assigning written and reading tasks as key strategies for promoting literacy development and improving academic outcomes.

On the other hand, the least effective instructional strategies for reading/writing learning style in School A is "facilitating book clubs" with a weighted mean of 3.00 interpreted as "Moderately effective", while in School B is "assigning research papers" with a weighted mean of 3.58 interpreted as "Effective". When combined, "assigning research papers" is the least effective with a weighted mean of 3.66 interpreted as "Effective". This implies that such strategy is not adequately engaging for students and contributes to lower learning outcomes in this area. This is contrary to the findings of Tamene (2020) that research paper assignments enhanced students' academic writing and research skills, with both students and teachers expressing positive views.

Table 10. Level of Effectiveness of Reading/Writing Instructional Strategies

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Reading/Writing						
a. Assigning Written Tasks	4.13	E	4.33	HE	4.23	E
b. Providing Reading Assignments	4.00	E	4.75	HE	4.38	HE
c. Facilitating Guided Reading	3.65	E	4.25	HE	3.95	E
d. Encouraging Journal Writing	3.98	E	4.58	HE	4.28	E
e. Assigning Research Papers	3.73	E	3.58	E	3.66	E
f.. Using Writing Prompts	3.45	E	4.33	HE	3.89	E
g. Engaging in Peer Editing	3.28	ME	4.58	HE	3.93	E
h. Conducting Literature Circles	3.40	E	4.33	HE	3.87	E
i. Facilitating Book Clubs	3.00	ME	4.33	HE	3.67	ME

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Highly Effective (HE)
3.40 – 4.19	Effective (E)
2.60 – 3.39	Moderately Effective (ME)
1.80 – 2.59	Slightly Effective (SE)
1.00 – 1.79	Not Effective (NE)

These results indicate that while certain reading and writing strategies are effective in promoting literacy, others, like facilitating book clubs and assigning research papers, fall short in engaging students meaningfully. This inconsistency highlights the need for educators to critically evaluate and adapt their instructional strategies to better meet the needs of reading/writing learners. It is essential to implement practices that not only align with pedagogical research but also resonate with students' interests and engagement to foster improved academic outcomes in literacy development. This conforms with Zamri et al. (2023) that creating interactive, supportive learning environments that cater to various modalities, enhancing student engagement and comprehension.

Kinesthetic. Table 11 provides data on the perceived effectiveness of kinesthetic instructional

strategies, as evaluated by teacher-respondents from both School A and School B. These ratings reflect the extent to which educators view each strategy as effective in fostering student learning and engagement.

The most highly effective instructional strategies for kinesthetic learning style in School A is "conducting hands-on experiments" with a weighted mean of 5.00 interpreted as "Highly effective", while at School B "organizing role-playing activities" and "using tactile learning materials" are the highest with both weighted means of 4.83 interpreted as "Highly effective". When combined, "conducting hands-on experiments" is the most highly effective with a weighted mean of 4.88 interpreted as "Highly effective". This implies a strong preference for interactive, hands-on learning approaches, indicating that active physical participation in lessons enhances learning retention and comprehension. This corroborates with the findings of Iyamuremye et al. (2023) that hands-on practical activities significantly enhance student engagement, experience, and academic performance.

On the other hand, the least effective instructional strategies for kinesthetic learning style at School A is "conducting field trips" with a weighted mean of 2.78 interpreted as "Moderately effective", while at School B, the least effective is "using simulations," with a weighted mean of 4.50 interpreted as "Highly effective". When combined, "conducting field trips" is the least effective overall, with a weighted mean of 3.72 interpreted as "Effective". This implies that despite the recognized benefits of field trips in engaging learners and providing experiential learning, logistical challenges hinder their optimal use in educational settings. This conforms with the findings of Campbell and Gedat (2021) that while field trips are highly valued for enhancing knowledge, interest, and communication skills, they often encounter difficulties such as dissatisfaction with time allocation and logistical planning. These findings align with the lower effectiveness ratings observed in this study, indicating that these challenges may affect the implementation of field trips as effective instructional strategies in these schools.

Table 11. Level of Effectiveness of Kinesthetic Instructional Strategies

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Kinesthetic						
a. Conducting Hands-on Experiments	5.00	HE	4.75	HE	4.88	HE
b. Organizing Role-Playing Activities	4.70	HE	4.83	HE	4.77	HE
c. Using Simulations	3.95	E	4.50	HE	4.23	E
d. Implementing Interactive Whiteboard Activities	3.00	ME	4.75	HE	3.88	E
e. Implementing Sensory Activities	3.90	E	4.67	HE	4.29	E
f. Conducting Field Trips	2.78	ME	4.67	HE	3.73	ME
g. Engaging in Physical Demonstrations	3.33	ME	4.67	HE	4.00	E
h. Using Tactile Learning Materials	3.30	ME	4.83	HE	4.07	E

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Highly Effective (HE)
3.40 – 4.19	Effective (E)
2.60 – 3.39	Moderately Effective (ME)
1.80 – 2.59	Slightly Effective (SE)
1.00 – 1.79	Not Effective (NE)

This further suggests that while hands-on experiments and role-playing activities are highly effective, the study shows that other kinesthetic strategies, such as field trips and simulations, are perceived as less effective. This reflects the varying degrees of effectiveness among different instructional strategies for kinesthetic learning. The data points to the importance of evaluating the practicality and impact of different kinesthetic activities, ensuring they align with logistical realities and student needs. Similarly, Patel (2020) emphasizes the importance of selecting instructional methods that align with both the needs of learners and the

logistical realities of the learning environment. The study highlights that schools often face challenges in implementing field trips and simulations, which may contribute to their lower effectiveness.

Multimodal. Table 12 provides data on the perceived effectiveness of multimodal instructional strategies, as evaluated by teacher-respondents from both School A and School B. These ratings reflect the extent to which educators view each strategy as effective in fostering student learning and engagement.

Lastly, in terms of multimodal instructional strategies, "developing interactive multimedia presentations" is the most effective strategy at both School A and School B, with weighted means of 5.00 and 4.83 both interpreted as "Highly effective", respectively, and an overall weighted mean of 4.92 interpreted as "Highly effective". This implies a strong preference for integrating multimedia tools to enhance teaching and engagement. This is in alignment to the findings of Abdul Samat and Abdul Aziz (2020) that multimedia learning significantly improves comprehension by scaffolding understanding through various media elements.

Meanwhile, the least effective instructional strategy for multimodal learning style is "designing flexible learning spaces" at School A with a weighted mean of 2.63 interpreted as "Moderately effective", while "facilitating Socratic seminars" at School B with a weighted mean of 4.50 interpreted as "Highly effective". When combined, "designing flexible learning spaces" is the least effective with a weighted mean of 3.69 interpreted as "Effective". This suggests that teachers perceive flexible learning spaces as less effective in supporting multimodal learning compared to other strategies. This concurs with the findings of Müller and Mildenberger (2021) that while flexible learning environments, such as those blended learning, aim to enhance adaptability, they do not consistently yield significantly better learning outcomes compared to conventional methods.

This further suggests that effective learning outcomes, particularly for multimodal learners, are associated with integrating interactive multimedia into instruction rather than focusing on flexible learning spaces, which require careful planning and pedagogical support to be effective. Similarly, Paman-Viador and Dioso (2023) found that multimedia-based instruction significantly enhanced the academic performance and foster greater engagement and active learning. Thus, they underscore the need to incorporate multimedia techniques in education to align with contemporary pedagogical practices.

Table 12. Level of Effectiveness of Multimodal Instructional Strategies

Instructional Strategies	School A		School B		Average Rating	
	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation	Weighted mean	Descriptive Interpretation
Multimodal						
a. Implementing Project-Based Learning	4.18	E	4.75	HE	4.47	HE
a. Developing Interactive Multimedia Presentations	5.00	HE	4.83	HE	4.92	HE
b. Facilitating Socratic Seminars	3.93	E	4.50	HE	4.22	E
c. Setting up Learning Stations	3.73	E	4.58	HE	4.16	E
d. Creating Concept Maps	3.73	E	4.58	HE	4.16	E
e. Utilizing Role-Playing and Simulation Games	4.60	HE	4.75	HE	4.68	HE
f. Designing Flexible Learning Spaces	2.63	ME	4.75	HE	3.69	E
g. Promoting Peer Tutoring	2.95	ME	4.75	HE	4.50	ME

Rating Scale	Descriptive Interpretation
4.20 – 5.00	Highly Effective (HE)
3.40 – 4.19	Effective (E)
2.60 – 3.39	Moderately Effective (ME)
1.80 – 2.59	Slightly Effective (SE)
1.00 – 1.79	Not Effective (NE)

3.5. Relationship Between Instructional Strategies Employed for Various Learning Styles and their Effectiveness.

The relationship that may exist between the instructional strategies employed and its effectiveness along visual, auditory, reading and writing, kinesthetic and multimodal was tested using the Spearman's rho correlation.

Table 13. Test for Significant Relationship between Instructional Strategies and Its Effectiveness

Effectiveness of Instructional Strategy	Instructional Strategy									
	Visual		Auditory		Reading and Writing		Kinesthetic		Multimodal	
	R	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Visual	.235	.093	.177	.210	.202	.150	.147	.297	.466**	.000
Auditory	.582**	.000	.521**	.000	.614**	.000	.525**	.000	.575**	.000
Reading and Writing	.196	.163	.183	.195	.414**	.000	.016	.910	.179	.203
Kinesthetic	.467**	.000	.510**	.000	.545**	.000	.260	.062	.318*	.022
Multimodal	.724**	.000	.774**	.000	.815**	.000	.692**	.000	.800**	.000

*Correlation is Significant @ 0.05 (2-tailed)
**Correlation is Significant @.01 (2-tailed)

Table 13 reveals that there is a significant relationship between the instructional strategies in terms of visual and its effectiveness along auditory (r=.582, p<.01), kinesthetic (r=.467, p<.01) and multimodal (r=.724, p<.01). The correlation between visual and auditory indicates a moderate positive relationship. This suggests that students who engage with both visual and auditory materials tend to have better learning outcomes. The effectiveness in using of multimedia presentation is significantly related to demonstrating the lessons with charts as instructional strategy of the teacher. Moreover, the instructional strategy along visual and its effectiveness along kinesthetic denotes a moderate positive relationship. It implies that visual strategies when combined with kinesthetic activities contribute positively to the effectiveness of instruction. Lastly, the visual instructional strategy and the effectiveness of multiple modes of learning indicates a strong positive relationship, meaning the effectiveness of multimodal strategy dramatically increases when visual strategy is being employed. This result further indicates that the multimodal approaches tend to enhance learning outcomes.

These findings conform with the study of by Khoirunnisa and Iba (2022) found a significant correlation between visual, auditory, and kinesthetic learning styles and mathematics achievement, indicating that combining multiple strategies may enhance learning outcomes. However, Eso et al. (2020) reported no significant difference in academic achievement between auditory and kinesthetic learners among medical students.

Moreover, Setyoningsih (2019) concluded that auditory and kinesthetic styles correlated significantly with English achievement, while the visual style did not. Osman et al. (2024) reported a weak relationship between kinesthetic learning and higher-order thinking skills but no significant impact for auditory or visual learners. In contrast, Eso et al. (2020) demonstrated that visual strategies were more effective in boosting academic achievement compared to auditory and kinesthetic approaches.

Likewise, the instructional strategy along auditory and the effectiveness of instructional strategy obtained significant relationship in terms of auditory (r=.521, p<.01), kinesthetic (r=.467, p<.01) and multimodal (r=.724, p<.01). The correlation between auditory when employed and its effectiveness in terms of the same variable and kinesthetic suggest a moderate positive relationship. It means delivering lectures and conducting hands-on experiments improve the learning outcomes of the students to a moderate extent. Moreover, auditory as instructional strategy and the effectiveness of multimodal represents a strong positive relationship. It means auditory teaching strategies significantly improve when multiple modalities of

instructions are employed and this is evident in developing interactive multi-media presentations.

These findings conform with the study by Setyoningsih (2019) who found out that visual, auditory, and kinesthetic styles collectively contributed significantly to academic performance. Similarly, Khoirunnisa and Iba (2022) indicated a significant relationship, suggesting that multimodal instructional strategies positively influence students' mathematical performance. Furthermore, the results of the study by Permana, et al. (2023) demonstrated that these learning styles significantly affect students' problem-solving skills, highlighting the effectiveness of multimodal instructional strategies. Additionally, Magulod (2019) found that students of applied science courses preferred visual, group, and kinesthetic learning styles, which were significantly related to their academic performance, suggesting that aligning instructional strategies with these learning preferences can enhance educational outcomes.

The table also reveals that the instructional strategies along reading and writing and the effectiveness along auditory (r=.614, p<.01), reading and writing (r=.414, p<.01), kinesthetic (r=.545, p<.01) and multimodal (r=.815, p<.01) obtained significant relationships. There is strong positive relationship on reading and writing as instructional strategy and effectiveness along auditory, moderate positive relationship along reading and writing and kinesthetic and very strong positive relationship on multimodal. Again, reading and writing as strategy in teaching is effective when combined with assigning written tasks and providing reading assignments; conducting hands-on experiments; and developing interactive multimedia presentations.

These findings align with Kumar (2021), who demonstrated that written-visual materials significantly enhanced students' speaking skills, emphasizing the importance of combining visual elements with written support to create lasting learning experiences. Additionally, Miles (2023) emphasized that multimodal pedagogy, integrating visual, spatial, and linguistic elements, enhances student engagement.

Further, instructional strategy on kinesthetic and the level of effectiveness along auditory (r=.525, p<.01) and multimodal (r=.692, p<.01) obtained moderate positive and strong positive relationships respectively. This indicates that when kinesthetic strategy is applied in the teaching process it enhances the learning outcomes when auditory and multiple modalities are effectively employed. These are evident when students are engaging in group discussions and performing hands-on activities.

These findings refute the study by Setyoningsih (2019) who found that while auditory and kinesthetic learning styles had significant correlations with English achievement, the visual learning style did not show a positive correlation. Similarly, a study by Osman et al. (2024) indicated a low positive relationship between the kinesthetic learning style and higher-order thinking skills, but no significant relationship for visual and auditory learning styles. Conversely, research by Eso et al. (2020) concluded that the visual learning style was more effective in improving academic achievement compared to auditory and kinesthetic styles.

Finally, the teaching strategy along multiple modalities and the effectiveness along visual (r=.466, p<.01), auditory (r=.575, p<.01), kinesthetic (r=.318, p<.05), and multimodal (r=.800, p<.01) obtained significant relationships. The effectiveness of visual and auditory obtained moderate positive relationship, kinesthetic, weak positive relationship and multimodal, very strong positive relationship. This means that as the use of visual as teaching strategy increases, there is a corresponding increase in the effectiveness of the aforementioned variables too. The statistical significance (p<.01) indicates that the findings are unlikely to be due to random chance, reinforcing the importance of visual strategy in the teaching and learning process.

These findings refute the study by Damasco et al. (2024) who revealed that there is a high prevalence of the kinesthetic learning style, followed by other modalities, suggesting that students benefit from instructional strategies that encompass multiple sensory modalities. Similarly, Mendoza (2019) found that while the auditory learning style was predominant, many students exhibited bimodal or trimodal preferences, indicating that they respond well to a combination of instructional methods. This underscores the effectiveness of multimodal strategies in catering to diverse learning preferences. Likewise, the study by Permana et al. (2023) concluded that incorporating multimodal instructional strategies significantly enhances students' problem-solving skills, highlighting the universal applicability of such approaches. Lastly, Setyoningsih (2019) found that auditory and kinesthetic learning styles had significant positive correlations with English learning

achievement, emphasizing the importance of employing diverse instructional strategies to accommodate various learning preferences.

3.6. Challenges Encountered in Adapting Teaching Methods to Address Diverse Learning Styles

Table 14 presents the challenges faced by School A and School B in adapting teaching methods to meet diverse learning styles.

Among the challenges encountered, "time constraints", which is interpreted as "Always a Problem" is the most frequently encountered at both School A and School B with weighted means of 3.33 and 3.58, respectively, and an overall a weighted mean of 3.46. This suggests that the limited duration of class time directly impacts the effectiveness of instructional strategies designed for diverse learners. This finding conforms with Onyishi and Sefotho (2020) who identified time constraints as a key challenge to implementing Differentiated Instruction (DI), noting that teachers often face difficulties in adapting lessons to meet diverse student needs due to limited class time.

On the other hand, among the challenges encountered, "evaluation and assessment methods" with a weighted mean of 2.73 and "resistance to change" with a weighted mean of 2.70 are least frequently encountered in School A, while in School B, it is "evaluation and assessment methods" with a weighted mean of 2.58. When combined, "evaluation and assessment" is the lowest with a weighted mean of 2.66 interpreted as "Sometimes a problem". This suggests that this aspect of teaching is not perceived as major obstacles in adapting instructional strategies to diverse learning styles.

Table 14. Challenges Encountered in Adapting Teaching Methods to Address the Diverse Learning Styles of Learners

Challenges Encountered	School A		School B		Average Rating	
	Weighted mean	Interpretation	Weighted mean	Interpretation	Weighted mean	Interpretation
1. Time Constraints	3.33	AP	3.58	AP	3.46	AP
2. Insufficient Resources/Materials	3.28	AP	3.42	AP	3.35	AP
3. Lack of Training/Professional Development	2.80	So P	2.75	So P	2.78	So P
4. Student Variability	3.13	So P	3.42	AP	3.28	So P
5. Resistance to Change	2.70	So P	2.92	So P	2.81	So P
6. Evaluation and Assessment Methods	2.73	So P	2.58	So P	2.66	So P
7. Limited Support Systems	3.13	So P	3.17	So P	3.15	So P
8. Classroom Management Challenges	3.08	So P	3.50	AP	3.29	So P
Overall Weighted mean					3.10	So P

Rating Scale — **Descriptive Interpretation**
3.25 – 4.00 — Always a Problem (AP)
2.50 – 3.24 — Sometimes a Problem (So P)
1.75 – 2.49 — Seldom a Problem (Se P)
1.00 – 1.74 — Not a Problem (NP)

3.7. Proposed Intervention to Enhance Teachers Capability in Addressing Different Learning Styles

Based on the findings of this study, it is evident that teachers at School A and School B face challenges in accommodating the diverse learning styles of their students. The data shows that kinesthetic and auditory learners are the most prevalent, while visual and reading/writing learners are less effectively addressed in instructional practices. Teachers encounter significant barriers, including time constraints, limited resources, and insufficient professional development opportunities, which hinder the effective implementation of differentiated instructional strategies. To address these challenges, the development of an Instructional Strategies Handbook is proposed. This handbook will serve as a long-term resource designed to support teachers in implementing differentiated instruction and creating inclusive learning environments tailored to various learning styles.

4. CONCLUSIONS

Based on the findings, the following salient conclusions are drawn:

1. The majority of learners are kinesthetic, while visual learners constitute the smallest group among intermediate learners at both schools.

2. The most frequently employed instructional strategy is delivering lectures while conducting field trips is the least employed.

3. There is no significant difference between learning styles and instructional strategies across respondents from School A, School B, and the total combined.

4. The most highly effective instructional strategy is "utilizing multimedia presentations" while the least effective instructional strategy is "using podcast" as perceived by teacher-respondents.

5. There is a significant positive relationship between instructional strategies and their effectiveness across various learning styles, particularly for multimodal, auditory, reading/writing, and kinesthetic strategies. Multimodal instructional strategies showed the strongest correlation with effectiveness, while visual strategies exhibited the weakest and least consistent correlation with learner outcomes.

6. Time constraints is the most frequently encountered challenge by teachers in implementing differentiated instruction.

7. The development of a VARKM instructional strategies handbook was proposed to support teachers to address diverse learning styles.

5. RECOMMENDATIONS

In light of the findings of the study, the following recommendations were hereby proposed:

1. Teachers may incorporate more strategies suited for kinesthetic learners, given their prevalence, while also ensuring the inclusion of approaches for visual learners to address their needs effectively.

2. School heads may encourage teachers to utilize least employed strategies such as field trips and podcasts by organizing professional development sessions and providing relevant resources.

3. Professional development coordinators may equip teachers with training on how to differentiate instruction based on individual learning styles.

4. Teachers may continue using strategies like multimedia presentations, which are perceived as highly effective, while instructional leaders and master teachers may work on improving the implementation of strategies like podcasts through coaching and mentoring.

5. Teachers may focus on multimodal strategies, which show strong effectiveness, and enhance visual approaches to better support visual learners.

6. School administrators and instructional leaders may provide workshops on efficient time management for differentiated instruction, focusing on strategies to deliver diverse teaching methods within a single class period. Teachers may also benefit from lesson planning templates designed to streamline the integration of multiple learning styles without sacrificing lesson completion.

7. School heads and district supervisors may encourage the use of the validated instructional strategies handbook to guide teachers in employing diverse strategies and fostering inclusive learning environments, and may modify it as needed to better suit the context.

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REFERENCES

Tomlinson, C. A. (2001). The differentiated classroom: Responding to the needs of all learners. Association for Supervision and Curriculum Development. ASCD Publishing.

Gardner, H. (1993). Multiple intelligences: The theory in practice. Basic Books.

Dunn, R., and Dunn, K. (1978). Teaching learners through their individual learning styles: A practical approach. Reston, VA: Reston Publishing Company.

Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Prentice Hall.

Fleming, N. D., and Mills, C. (1992). Not another inventory, rather a catalyst for reflection. To Improve the Academy: A Journal of Educational Development, 11, Article 246. https://digitalcommons.unl.edu/podimproveacad/246.

Pashler, H., McDaniel, M., Rohrer, D., and Bjork, R. (2008). Learning styles: Concepts and evidence. Psychological Science in the Public Interest, 9(3), 105-119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Llego, M. A. (2022, August 26). Differentiated Instruction: A How-To Guide for Teachers. TeacherPH. https://www.teacherph.com/differentiated-instruction/

Department of Education. (2016). DepEd Order No. 035, s. 2016: The learning action cell as a K to 12 basic education program school-based continuing professional development strategy for the improvement of teaching and learning. https://www.deped.gov.ph/2016/06/07/do-35-s-2016/

Bualat et al. (2023) – Bualat, R. J., Lucero, J. A. G., Zamora, C. F., Arcamo, F. E. S., and Tantog, A. J. D. (2023). Embarking on VARK: A Case Study on Learners' Preference in Learning English. International Journal of Academic Multidisciplinary Research (IJAMR), 7(7), 53-67. https://doi.org/10.17605/OSF.IO/F3A96

Kadam, P. R., Gaikwad, U. K., and Bhamre, P. D. (2021). Student centred learning using student's learning style. Journal of Engineering Education Transformations, 34, 391-395. DOI: 10.16920/jeet/2021/v34i0/157185

Černá, E. (2023). Learning styles of English learners at lower secondary schools [PDF]. Theses.cz. Retrieved from https://theses.cz/id/dzs8r5/STAG95909.pdf?zpet=%2Fvyhledavani%2F%3Fsearch%3D%22Learning%20Styles%20of%20English%20Learners%20at%20Lower%20Secondary%20Schools%22%20or%20%22Eli%C5%A1ka%20%C4%8Cern%C3%A1%22%26start%3D1;info=1;isshlret=or%3B

Gola and Singh (2019) – Gola, M. R., and Singh, M. D. (2019). A Study of Learning Styles and Learning Preferences. https://www.researchgate.net/publication/350823418

Feklistova, L., and Tiik, M. H. (2023). Learning materials containing multimedia: the experience of secondary school teachers in estonia. In edulearn23 proceedings (pp. 4922-4930). Iated. Retrieved from https://library.iated.org/view/feklistova2023lea

Rosmiati, A., Kurniawan, R. A., Prilosadoso, B. H., and Panindias, A. N. (2020). Aspects of visual communication design in animated learning media for early childhood and kindergarten. International Journal of Social Sciences, 3(1), 122-126. https://doi.org/10.31295/ijss.v3n1.260

Raimi, M. O., Awotua-Efebo, E. B., Owapiriba, J. A., Adesina, A. D., Oyeyemi, A. S., Raimi, A. G., Elemuwa, C. O., Elemuwa, C. O., and Oginifolunnia, O. C. (2024). Ignoring reason and evidence: Factors influencing learning preferences and modalities among clinical learners in a South-South Nigerian medical school. JMIR Medical Education. https://doi.org/10.2196/preprints.63404

Alaagib, Musa, and Saeed (2019) – Alaagib, N. A., Musa, O. A., and Saeed, A. M. (2019). Comparison of the effectiveness of lectures based on problems and traditional lectures in physiology teaching in Sudan. BMC Medical Education, 19(1), 1-8. https://doi.org/10.1186/s12909-019-1805-x

Andrade, R.F., and Páez Paredes, M. (2021). The podcast as a feedback tool in evaluating virtual activities. Mendive, 19(1), 16-29. Retrived from

https://journals.co.za/doi/abs/10.20853/34-1-2827

Kumari, D. R., Tiwari, D. R., Akhtar, R., and Gupta, S. (2023). Traditional teaching method Vs Modern teaching method. GPH-International Journal of Educational Research, 6(11), 80-85. https://doi.org/10.5281/zenodo.10429275

Håland, A., Hoem, T. F., and McTigue, E. (2019). Writing in first grade: The quantity and quality of practices in Norwegian classrooms. Early Childhood Education Journal, 47(4), 611-622. https://doi.org/10.1007/s10643-018-0908-8

Moran, R. R. M., Ward, N. A., Billen, M. T., Wood, L., and Yang, S. (2023). Digital and virtual book clubs: Breaking the boundaries of restrictive literacy practices. In R. N. Pikowsky and A. M. Williamson (Eds.), Exploring online learning through synchronous and asynchronous approaches (pp. 266-287). IGI Global. https://doi.org/10.4018/978-1-6684-7015-2.ch014

Kirani, D. N. P., and Savitri, W. E. (2023). Examining educators' strategies in teaching English for specific purposes: A case analysis. Yavana Bhāshā: Journal of English Language Education, 6(2), 125-136. https://doi.org/10.46733/pesh2090225p

Edgar, C.M. (2023). Breaking Bad News: Simulation Interventions in Advanced Practice Provider Programs. University of Lynchburg DMSc Doctoral Project Assignment Repository, 5(1). Retrieved from https://digitalshowcase.lynchburg.edu/dmscjournal/vol5/iss1/163/

Obielodan, O. O., Onojah, A. O., Onojah, A. A., Alabi, O. S., and Alimi, E. A. (2023). The teachers' extent of utilizing teaching methods for teaching basic technology. Journal of Research in Instruction, 1(2). https://doi.org/10.30862/jri.v1i2.14

Department of Education. (2001). DO 56, s. 2001 – Policy on educational field trips. Republic of the Philippines. https://www.deped.gov.ph/2001/12/20/do-56-s-2001-policy-on-educational-field-trips/

Department of Education. (2002). DO 51, s. 2002 – Guidelines on the conduct of educational field trips: Supplement to DepEd Order No. 56, s. 2001. Republic of the Philippines. https://www.deped.gov.ph/2002/10/25/do-51-s-2002-policy-of-educational-field-trips-supplement-to-deped-order-no-56-s-2001/

Obielodan, O. O., Onojah, A. O., Onojah, A. A., Alabi, O. S., and Alimi, E. A. (2023). The teachers' extent of utilizing teaching methods for teaching basic technology. Journal of Research in Instruction, 1(2). https://doi.org/10.30862/jri.v1i2.14

Appolinus, I., Ehirim, I., Nwankwo, P. C., Amanze, K. O., and Unegbu, S. O. (2021). Effectiveness and utilization of field trip as a method of teaching and learning chemistry in senior secondary schools in a council area of Imo State, Nigeria. Asian Journal of Education and Social Studies, 21(4), 1-9. https://doi.org/10.9734/ajess/2021/v21i430512

Westmoreland, K. D., Banda, F. M., Steenhoff, A. P., Lowenthal, E. D., Isaksson, E., and Fassl, B. A. (2019). A standardized low-cost peer role-playing training intervention improves medical student competency in communicating bad news to patients in Botswana. Palliative and Supportive Care, 17(1), 60–65. doi:10.1017/S1478951518000627

Nazarov Rustam Irkinovich. (2022). The importance of role-playing game in teaching english in a non-linguistic university. International Journal of Pedagogics, 2(09), 29–32. https://doi.org/10.37547/ijp/Volume02Issue09-07

Winkels, K. M. (2024). Using real-time assessments in Socratic seminars: A descriptive case study (Doctoral dissertation). Northcentral University. ProQuest Dissertations Publishing. https://www.proquest.com/openview/b6fbb93bde7561e7b4d08cdf56d44af5/1?pq-origsite=gscholarandcbl=18750anddiss=y

Tremblay-Wragg, É., Raby, R., Ménard, L., and Plante, I. (2019). The use of diversified teaching strategies by four university teachers: What contribution to their learners' learning motivation? Teaching in Higher Education, 26 (1), 97-114, https://doi.org/10.1080/13562517.2019.1636221

Kadam, P. R., Gaikwad, U. K., and Bhamre, P. D. (2021). Student centred learning using student's learning

style. Journal of Engineering Education Transformations, 34, 391-395. DOI: 10.16920/jeet/2021/v34i0/157185

Balgan, A., Renchin, T., and Ojgoosh, K. (2022). An experiment in applying differentiated instruction in STEAM disciplines. Eurasian Journal of Educational Research, 98(98), 21-37. https://ejer.com.tr/manuscript/index.php/journal/article/view/666/86

Samat, M. S. A., and Abdul Aziz, A. (2020). The effectiveness of multimedia learning in enhancing reading comprehension among indigenous pupils. Arab World English Journal (AWEJ), 11(2), 290-302. https://doi.org/10.24093/awej/vol11no2.20

Tarkhova, L., Tarkhov, S., Nafikov, M., Akhmetyanov, I., Gusev, D. and Akhmarov, R. (2020). Infographics and Their Application in the Educational Process. International Journal of Emerging Technologies in Learning (iJET), 15(13), 63-80. Kassel, Germany: International Journal of Emerging Technology in Learning. Retrieved September 23, 2024 from https://www.learntechlib.org/p/217600/.

Baneres, D., Whitelock, D., Ras, E., Karadeniz, A., Guerrero-Roldán, A. E., and Rodríguez, M. E. (2020). Technology enhanced learning or learning driven by technology? International Journal of Educational Technology in Higher Education. https://www.springeropen.com/collections/tellet

Yang, Y. (2023). Chinese EFL learners' verbal behaviors and perceptions of in-class group discussions in an English-medium university. In 11th International Education, Economics, Social Science, Arts, Sports and Management Engineering Conference (pp. 1-9). New York University. Retrievedfromhttps://webofproceedings.org/proceedings_series/ESSP/IEESASM%20202/S18.pdf

Tarmawan, I., Rusdiyana, R., Salim, A., and Ulpah, A. (2021). The Role of Podcasts as an Alternative Media for Learning and Distribution of Audio Based Content. International Journal of Research and Applied Technology (INJURATECH), 1(1), 1-8. https://doi.org/10.34010/injuratech.v1i1.5453

Andersen, R. H., and Dau, S. (2021). A review of podcasts as a learning medium in higher education. In Proceedings of the 20th European Conference on e-Learning, ECEL 2021 (pp. 34-41). Academic Conferences and Publishing International. https://www.academic-conferences.org/conferences/ecel/

Abid N, Aslam S, Alghamdi AA and Kumar T (2023) Relationships among learners' readinghabits, study skills, and academic achievement in English at the secondarylevel.Front.Psychol.14:1020269.doi: 0.3389/fpsyg.2023.1020269

Tamene, K. (2020). The role of research paper assignment in the development of EFL learners' academic writing: Case study of second-year master EFL learners of sciences of the language at Biskra University [Master's thesis, Mohamed Khider University of Biskra]. University of Biskra Repository. http://archives.univ-biskra.dz/bitstream/123456789/16100/1/Karima_TAMENE.pdf

Zamri, N., Mansor, N. A., and Fatzel, F. H. M. (2023). My e-Mind Maps: A Multi-modal Approach Engaging Visual and Auditory Learning Styles. APS, 67. https://doi.org/10.5281/zenodo.8196786

Iyamuremye, A., Nsabayezu, E., Ngendabanga, C., and Hagenimana, F. (2023). Effectiveness of hands-on practical activities in teaching and learning chemistry: An exploration of learners' engagement, experience, and academic performance. African Journal of Educational Studies in Mathematics and Sciences, 19(1), 97-106. https://dx.doi.org/10.4314/ajesms.v19i1.7

Campbell, Y. M., and Gedat, R. (2021). Experiential Learning through Field Trips: Effects on Educational, Social and Personal Development among Linguistics Majors. Journal of Cognitive Sciences and Human Development, 7(2), 131–144. https://doi.org/10.33736/jcshd.3430.2021

Patel, D. (2020). Instructional Methods and Strategies. National Education Policy 2020 Vision for India's Future Education, 1-29. Retrieved from https://www.researchgate.net/publication/359648503

Samat, M. S. A., and Abdul Aziz, A. (2020). The effectiveness of multimedia learning in enhancing reading comprehension among indigenous pupils. Arab World English Journal (AWEJ), 11(2), 290-302. https://doi.org/10.24093/awej/vol11no2.20

Müller, C., Mildenberger, T., and Steingruber, D. (2023). Learning effectiveness of a flexible learning study programme in a blended learning design: Why are some courses more effective than others? International Journal of Educational Technology in Higher Education, 20, Article 10. https://doi.org/10.1186/s41239-022-00379-x

Paman-Viador, D. E., and Dioso, E. D. (2023). The effects of multimedia-based instruction towards the English performance of Grade 10 learners. EPRA International Journal of Multidisciplinary Research (IJMR), 9(8), 1-10. https://doi.org/10.36713/epra2013

Khoirunnisa, S., & Iba, K. (2022). Correlation Study Of Visual, Auditorial and Kinesthetic Learning Styles (VAK) With Mathematics Learning Outcomes For Elementary School Students. Jurnal Paedagogy, 9(4), 790-798. doi:https://doi.org/10.33394/jp.v9i4.5495

Eso et al. (2020)   Eso, A., Martisa, E., & Febrianti, E. (2020, June). Comparison of Visual, auditory and kinesthetic style to the academic achievement of Medical Education Student. In ISLLCE 2019: Proceedings of the First International Seminar on Languare, Literature, Culture and Education, ISLLCE, 15-16 November 2019, Kendari, Indonesia (Vol. 16, No. 18, p. 304). European Alliance for Innovation. https://books.google.com.ph/books?hl=en&lr=&id=FSYhEAAAQBAJ&oi=fnd&pg=PA304&dq=%22eso%22+medical+students&ots=8N03VEFLBH&sig=-opoTYMdWXu465DkSqZjdfPMO-k&redir_esc=y#v=onepage&q=%22eso%22%20medical%20students&f=false

Setyoningsih, L, Dhini. 2019. The Correlation of Visual, Auditory and Kinesthetic Learning Style on Studentsâ€™ English Learning Achievement. Thesis, English Education Department, Postgraduate Program, Islamic University of Malang, Advisor : Dr. Hj. Kun Aniroh, M.Pd. https://jim.unisma.ac.id/index.php/LANG/article/view/3391

Osman et al. (2024)   Osman, N. W., Salleh, W. M. N. H. W., & Taha, H. (2024). A Correlation Study of Visual, Auditory, and Kinesthetic Learning Styles against Students' Higher Level Thinking Skills in the Topic of Respiration. Jurnal Pendidikan Sains Dan Matematik Malaysia, 14(1), 29-37. https://doi.org/10.37134/jpsmm.vol14.1.3.2024

Permana, et al. (2023) Permana, P.G.A.M., Ma, L., Insani, K.F., and Rusmawati, R. (2023). News site as virtual linguistic landscape: Representation on linguistic landscape and multimodal discourse analysis. Alphabet, 06(02), 81-103. doi: 10.21776/ ub.alphabet.2023.06.02.02

Magulod, G.C., Jr. (2019). Learning styles, study habits and academic performance of Filipino university students in applied science courses: Implications for instruction. Journal of Technology and Science Education, 9(2), 184-198. https://doi.org/10.3926/jotse.504

Kumar, T. (2021). The impact of written visual materials in the development of speaking skills in English language among secondary level

    students. Journal of Language and Linguistic Studies, 17(2), 1086-1095. Doi: 10.52462/jlls.76

Miles, S. A. (2023). A multimodal text-to-MIDI transformer model with special consideration to artist usage [Doctoral dissertation, University of Missouri-Kansas City]. MOspace. Retrieved from https://mospace.umsystem.edu/xmlui/handle/10355/96469

Damasco et al. (2024) Damasco, H., Oyangorin, T. E., Ravidas, D. C., Salmon, S. D., Tapayan, C. P. A. E., Ubanan, R. J., ... & Luzano, J. F. P. (2024). VARK Learning Styles and Academic Achievement of Pre-service Teachers in a State University in the Philippines. Retrieved from http://ijeais.org › uploads › 2024 › IJAMR240520

Mendoza (2019) Mendoza, L. (2019). Learning styles preferences of Grade 10 students in the district of Maragondon: Input for differentiated instruction. Ascendens Asia Journal of Multidisciplinary Research Abstracts, 3(2F). https://ojs.aaresearchindex.com/index.php/AAJMRA/article/view/8716

Onyishi, C. N., and Sefotho, M. M. (2020). Teachers' Perspectives on the Use of Differentiated Instruction in Inclusive Classrooms: Implication for Teacher Education. International Journal of Higher Education, 9(6), 136-150. https://eric.ed.gov/?id=EJ1277890

Yuniawati, D. T. (2024). EFL Teachers' Voices in Differentiated Instruction. Universitas Negeri Yogyakarta. https://doi.org/10.56855/ijcse.v2i2.780