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Spelling Intervention Reimagined: Enhancing Grade 6 Students' Spelling Literacy through Tactile, Digital, and Phonetic Strategies

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Abstract. This study provides a novel comparative analysis of tactile, digital, and phonetic strategies among Grade Six students, highlighting the superior performance of phonetic methods while offering actionable insights into the specific benefits and challenges associated with each approach. Employing a counterbalanced quasi-experimental design to three different groups with a total of 200 students through complete enumeration, the study reveals that students' exposure to the phonetic strategy was found to be most effective, which resulted in Outstanding performance, while the digital strategy resulted in Satisfactory performance, and tactile strategy yielded a Fairly Satisfactory performance. The phonetic strategy resulted in significant differences in students' mean spelling scores ($p < 0.001$). Highlights for tactile strategy include the fun factor in gamification, which enhances effectiveness due to ease of manipulation. In contrast, digital strategy incorporates the fun factor in gamification to aid in remembering, provides a helpful challenge, and motivates users through a ranking system. Phonetic strategy, meanwhile, involves chunking words based on syllables, which enhances the effectiveness of learning a word and offers the flexibility to divide words. Lowlights for tactile strategy include difficulty in finding the letters, limited number of letters, and level of difficulty, while for digital strategy include random tapping or placement of letters, technical issues, and anagrammatic words, and for phonetic strategy include single or multiple syllables, level of difficulty, and effectivity silent or double letters. It is recommended that grade school teachers, especially in the grade six level who are teaching spelling, should look into the dynamics of these three strategies in terms of performance results, highlights, and lowlights in contextualizing instructions, as well as considering the mixture of all three strategies rather one focusing only on one to address the varied needs of the students. Further, this paper recommends the conduct of parallel studies in other grade levels or public schools to compare results and to have a better viewpoint of the topic being studied.

Keywords: Counterbalanced quasi-experimental design; Digital strategy; English spelling literacy; Phonetic strategy; Tactile strategy.

1.0 Introduction

The loss of competence in spelling ability experienced by students (Rzepka et al., 2022) is a concern that should be taken seriously by schools, as it leaves at least 763 million adults worldwide still unable to read and write, and 250 million children failing to acquire basic literacy skills (UNESCO, 2023). Teaching spelling to children should be systematic so they learn how the writing system works and not just memorize how words are spelled (Treiman, 2018); however, teachers are aware that not all students benefit from the traditional spelling instruction method,

but in the absence of a more effective strategy, they revert to the old ways (Berger, 2016). The emphasis on language literacy, which focuses on the knowledge of words and their meanings in isolation and/or in context, understanding the parts and structure of words, and how they are used in spelling and to make meaning **(**Matatag Curriculum, 2023) has called for educators to revitalize strategies in teaching spelling across grade levels. To date, existing studies on developing spelling literacy have focused primarily on the early stage between preschool and primary years but not in the intermediate grades. Thus, this counter-balanced quasi-experimental design study aims to investigate the effectiveness of strategies in developing spelling skills among intermediate pupils.

A significant characteristic of language is its ability to convey meaning across oral and written forms (Levesque et al., 2021). As the smallest units of meaning in a language, morphemes are the foundational building blocks that convey meaning, and morphological skills enable their effective use in both oral and written language. Growing evidence implies that morphological skills are correlated to literacy outcomes, including word reading, spelling, and reading comprehension. Orthography, a standardized writing system for a specific language that defines how letters represent sounds and words, including spelling rules (Hopkins, 2019), serves as a foundational element of language and literacy (Kirby, 2019). According to Ehri's (2005, 2014) Phase Theory of Reading Development, morphological processes begin to impact literacy once a robust foundation in the alphabetic principle is established. Spelling tests are practical measures tapping an individual's ability to retain precise knowledge of the orthographic structure of words, a prime ability in reading, according to Conrad et al. (2019) and Ouellette et al. (2017). For instance, it was believed that one of the handy tools for exploring literacy difficulties in children, when early appropriate interventions and supports can still be provided, is a computer-scored spelling measure. This has emphasized that orthographic skills are not only an essential element of language but also a practical means of early assessment of literacy difficulties, thereby finding ways to address them at an early stage in their education.

In academia, various strategies and interventions have been devised by both teachers and researchers to develop students' spelling competence; this study will employ three varied learning strategies. First, the Tactile strategy refers to the use of manipulative letters that can be moved together or apart to represent abstract concepts of phonemic blending and segmentation (Pullen & Lane, 2016), such as Scrabble letter tiles, which hold a child's attention. When a student's attention is being maintained, they can focus on the learning at hand (Rippel, 2021). Second, the digital strategy refers to the use of digital-based spelling games, such as Spelling City, to investigate the effects on student spelling achievement. This results in a significantly more significant spelling improvement in the active training group compared to the control group in general spelling ability (Holz et al., n.d.). Third, the phonetic strategy refers to a word decoding strategy that involves chunking words into known phonetic sounds. In her classroom research, Mentink (2022) found that after introducing the "chunking" strategy, students could eventually chunk the word in whatever way they wanted and figure out their own way to spell it. This strategy taught them how to chunk for future words when not working in small groups. In addition, Ravara (2020) found that when students use a phonetic strategy, they look for familiar sounds in words that can be applied to unfamiliar spelling words with similar sounds.

While these strategies are already research-based and have been conducted in the classroom setting, language teachers still struggle to identify which strategies would best fit the context of their students, as well as their knowledge of teaching spelling, for its conversion into an effective classroom pedagogy. This paper aims to investigate the effectiveness of tactile, digital, and phonetic strategies in developing spelling skills among Grade 6 students at Sacred Heart School-Ateneo de Cebu. Specifically, it aims to address the following: (1) students spelling performance after being exposed to the tactile strategy; (2) students' spelling performance after being exposed to the digital strategy; (3) students' spelling performance after being exposed to the phonetic strategy; and (3) whether or not there are statistically significant differences in the spelling performance of students after being exposed to the three different strategies; and highlights and lowlights of each strategy.

2.0 Methodology

2.1 Research Design

This research employed a counterbalanced quasi-experimental design, in which three groups were exposed to three different treatments, but in a different order than the other groups (Fraenkel et al., 2012). In this quantitative design, the number of groups was equal to the number of treatments, although the order in which the groups

received treatment was randomly determined (Gay et al., 2009) to describe the spelling performances of the Grade 6 students through three sets of researcher-made spelling tests. Additionally, it employed a qualitative method to identify the highlights and lowlights of the three strategies used, as determined through interview questions in the Focus Group Discussion (Nyumba et al., 2018).

2.2 Research Participants

Through A complete enumeration was conducted, and all 200 Grade 6 students at Sacred Heart School-Ateneo de Cebu were invited to participate in this study. This grade level was purposively chosen as this is the exit year for the Grade School level. Additionally, this batch will undergo pilot testing of the Matatag Curriculum during the 2024-2025 school year. Then, fourteen purposively selected students from the entire population. Seven of them were chosen from the highest-performing bracket, while the other 7 were chosen from the lowest-performing bracket. Individuals who did not meet these specifications or those unwilling to participate were excluded to ensure the integrity of the data collected.

2.3 Research Instrument

This study utilized 4 research-made instruments that at least two experts validated: The set A Spelling Test, which was administered after the Tactile strategy; Set B Spelling Test, which was administered after the Digital strategy; Set C Spelling Test, which was administered after the Phonetic strategy; and an Interview Questionnaire for the FGD. All the words in each set were randomly selected from the main list of 300 spelling words for 6th grade (Fisher, 2011).

2.4 Data Gathering Procedure

Pre-implementation

The six sections in Grade Six were purposively divided into three groups based on the composition of each section: Group A consisted of Loyola and Regis, Group B comprised Canisius and Bellarmine, and Group C included Claver and Gonzaga. They were oriented with the three different learning experiences to which they were exposed. Questions and clarifications were addressed to them before the implementation started.

Implementation

The implementation of the three learning strategies ran within nine cycles during the 2nd trimester of the school year 2023-2024. The table below shows the differentiated schedules of the three groups about the three strategies.

Table 1. *Schedule of Three Sets of Interventions for Three Groups*

Schedule		GROUP A (Loyola & Regis)	GROUP B (Canisius & Bellarmine)	GROUP C (Claver & Gonzaga)
Cycle 1	Session 1	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 2	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 3	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 4	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
Cycle 2	Session 5	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 6	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 7	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
	Session 8	Set A: Tactile (5 words)	Set B: Digital (5 words)	Set C: Phonetic (5 words)
Cycle 3	Session 9			
	Session 10	Set A Posttest	Set B Posttest	Set C Posttest
	Session 11			
	Session 12			
Cycle 4	Session 1	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 2	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 3	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 4	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
Cycle 5	Session 5	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 6	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 7	Set B: Digital (5 words)	Set C: Phonetic (5 words)	Set A: Tactile (5 words)
	Session 8	Set B: Digital	Set C: Phonetic	Set A: Tactile

		(5 words)	(5 words)	(5 words)
	Session 9			
	Session 10	Set B Posttest	Set C Posttest	Set A Posttest
Cycle 6	Session 11			
	Session 12			
	Session 1	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 2	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
Cycle 7	Session 3	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 4	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 5	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 6	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
Cycle 8	Session 7	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 8	Set C: Phonetic (5 words)	Set A: Tactile (5 words)	Set B: Digital (5 words)
	Session 9			
	Session 10	Set C Posttest	Set A Posttest	Set B Posttest
Cycle 9	Session 11			
	Session 12			

Implementation of Tactile Strategy

In this strategy, forty randomly selected words were equally distributed across the eight sessions. In every session, the teacher gave five words, which were said aloud twice. The students formed the given word using their manipulatives (i.e. Scrabble tiles)

Implementation of Digital Strategy

While class Group A is using the Tactile strategy, class Group B uses the Digital strategy. In this strategy, a second set of forty randomly selected words was also distributed equally across the eight sessions. This time, every set of words was preloaded into each student's iPad, and they played a pre-installed application or web-based game that contained the given words.

Implementation of Phonetic Strategy

This strategy was first utilized by class Group C. In this strategy, the students were first taught how the process of "chunking" a word works. It is for them to see how they can break down the words into pieces based on the sounds they hear within the word. Afterward, the teacher read the words aloud, and the students chunked the words on their own by putting every chunk in a box or circle or using dots or slashes. The students will be given the freedom to group the letters according to the sound of each word.

Two cycles were allotted for exposure of each strategy, and then on the 3rd cycle, they were given the posttest.

Post-implementation

During the posttest, ten randomly selected words derived from the forty given words were used. The teacher said every word twice, and the students spelled out the words by writing on a sheet of paper. Answers were checked and documented.

2.5 Data Analysis

In terms of quantitative analysis, this study employed the Kruskal-Wallis test to identify whether there were statistically significant differences in students' spelling performance after exposure to the three different strategies. For the qualitative analysis, the study utilized Braun and Clarke's (2006) Thematic Analysis through a Focused Group Discussion (FGD) to gather in-depth insights into the students' experiences with each strategy.

2.6 Ethical Considerations

Before the study, endorsements and approvals were sought from the Sacred Heart School-Ateneo de Cebu grade school principal's office and the institutional research council, respectively. Moreover, since the study involves minor participants (those under eighteen), a consent form explaining the purpose of the study, procedures, risk assessment, benefits, duration of participation, statement of confidentiality, voluntary participation, and termination of participation was sought from both the participants and their parents or guardians. By the Data Privacy Act of 2012, all data were gathered, analyzed, kept, and disposed of with utmost confidentiality.

3.0 Results and Discussion

3.1 Students' Spelling Performances

In this phase, the researchers investigated the impact of three different spelling strategies on students' spelling performance. The students were exposed to a tactile strategy, a digital strategy, and a phonetic strategy, each designed to support the development of their spelling skills. Then, posttests were administered to each group following the counterbalanced quasi-experimental research design.

The following dataset, presented in Table 2, suggests that the student's spelling performance was positively impacted by the use of the Tactile Strategy, yielding the highest mean score and falling within the "Satisfactory" range, as exhibited by Group A. However, the performance of Groups B and C fell within the "Fairly Satisfactory" limit, which is lower compared to Group A's performance. This means that the Tactile Strategy might have been more effective for one type of student over another, or, more likely, other factors, such as learning style and prior knowledge, may also affect students' performances. Further research identified that manipulatives, such as Scrabble tiles, allowed students to visualize and utilize letter combinations and phonemic blending while spelling (Ehri & Wilce, 1980). Other studies have established the need for spelling instruction to incorporate substantial time using multisensory approaches with activities that allow for both tactile and kinesthetic engagement, making many options for spelling development possible, including those with auditory processing difficulties.

Table 2. *Students' Spelling Performance after Exposure to Tactile Strategy*

Group	n	Mean (SD)	Transmuted Grade	Description
Group A	69	6.81 (0.896)	80	Satisfactory
Group B	60	6.38 (1.209)	77	Fairly Satisfactory
Group C	67	6.34 (1.388)	77	Fairly Satisfactory

Table 3. *Students' Spelling Performance after Exposure to Digital Strategy*

Group	n	Mean (SD)	Transmuted Grade	Description
Group A	69	7.83 (0.907)	87	Very Satisfactory
Group B	60	7.35 (1.459)	83	Satisfactory
Group C	67	7.51 (1.160)	84	Satisfactory

Table 4. *Students' Spelling Performance after Exposure to Phonetic Strategy*

Group	n	Mean (SD)	Transmuted Grade	Description
Group A	69	9.14 (0.692)	94	Outstanding
Group B	60	8.45 (1.199)	90	Outstanding
Group C	67	8.37 (1.358)	89	Very Satisfactory

According to the dataset presented in Table 3, the Digital Strategy has indeed helped improve the spelling performance of the students. Group A achieved the highest mean score within the "Very Satisfactory" range, while Groups B and C also performed exceptionally well, with their mean scores falling within the "Satisfactory" range. This suggests that the digital strategy may have been effective in improving their spelling skills across the three groups. A recent study highlighted that digital tools, such as educational software and online resources, enhance spelling development by enabling interactive and personalized learning (Qamariah & Wahyuni, 2018). The integration of technology-based approaches with traditional approaches can lead to improved spelling outcomes in students, as noted by Little et al. (2018).

Based on Table 4, it can be observed that the Phonetic Strategy was highly effective and achieved significant success in spelling for all three groups. The mean scores of the three groups fell within the categories "Outstanding" and "Very Satisfactory." This was far above the achievements in previous data, achieved through the use of Tactile and Digital Strategies. Research findings consistently indicate that a phonics-based approach effectively assists learners in developing strong spelling skills (Ehri, 2014; Torgesen & Hudson, 2006). Probably, the phonetic approach worked best in general for the students' spelling skills since it systematically devoted instructional time to letter-sound relationships and phonemic awareness. The findings underscore the inherent importance of incorporating multisensory, evidence-based approaches—such as phonics-based instruction—into spelling development supports.

Since the Shapiro-Wilk test reported a significant violation of normality in the dataset (p <), the Kruskal-Wallis test was performed to check for significant differences in mean spelling scores across the three different strategies employed by the students. In Table 5, the Kruskal-Wallis test statistic for the Tactile Strategy was $\chi^2 = 5.39$ with 2 degrees of freedom (df) and a p-value of 0.067. In the case of the Digital Strategy, the test statistic was 2.27 with two df and a p-value of 0.321. These p-values are above the standard level of significance, 0.05, indicating that the mean score differences between groups were not significant for the items assessing Tactile and Digital Strategies.

Table 5. *Kruskal-Wallis Test on Students' Mean Score Differences in Tactile, Digital, and Phonetic Strategies*

	χ^2	df	p	Pairwise comparisons	W	p
				Group A-Group B	-2.994	0.086
TACTILE Strategy	5.39	2	0.067	Group A-Group C	-2.636	0.149
				Group B-Group C	0.404	0.956
				Group A-Group B	-1.844	0.393
DIGITAL Strategy	2.27	2	0.321	Group A-Group C	-1.811	0.406
				Group B-Group C	0.121	0.996
				Group A-Group B	-5.513	< .001
PHONETIC Strategy	18.63	2	< .001	Group A-Group C	-5.067	< .001
				Group B-Group C	-0.145	0.994

However, the Kruskal-Wallis test of the phonetic strategy yielded a test statistic of 18.63 with two degrees of freedom and a p-value of less than 0.001. Thus, there was a statistically significant difference in average spelling scores across groups using the Phonetic Strategy. Pairwise comparisons were performed using the Wilcoxon rank-sum test with the Bonferroni correction. It showed that in the Phonetic Strategy, the mean scores of Group A were significantly higher than those of Group B ($W = -5.513$, $p < 0.001$) and Group C ($W = -5.067$, $p < 0.001$). No significant difference was, however, detected between Group B and Group C ($W = -0.145$, $p = 0.994$).

In summary, the Kruskal-Wallis test revealed a statistically significant difference among the students' average spelling scores for the Phonetic Strategy, with Group A outperforming Groups B and C. However, there was no significant difference between the groups in the use of either the Tactile or Digital Strategy. This would, therefore, indicate that the Phonetic Strategy may be more effective in improving spelling performance compared to both the Tactile and Digital strategies.

3.2 Highlights and Lowlights of Each Intervention

Results from the thematic analysis are highlighted in this phase, showcasing both the highlights and lowlights of each intervention based on the qualitative responses from participants during the focus group discussions.

Highlights

Tactile Strategy

Fun Factor in Gamification

Throughout, these gamification themes were described by participants like P5 as "fun" and "enjoyable," likened to "playing games." Hands-on, game-like, tactile approaches using physical tiles were described as innovative and exciting ways to learn how to spell. As P7 expressed, "Tactile was unique and fun; working with blocks was enjoyable." Another added, "It was so much fun and easy because it was like Scrabble." The idea of this as an enjoyable process appears to have been one of the motivating factors, as one respondent articulated, "It allowed me to have fun," referring to the process as "a fun experience." Research has repeatedly shown that multisensory instruction yields positive results in literacy skills, particularly in spelling. More crucial, concrete and kinesthetic activities typically lead to higher levels of engagement, motivation, and retention in learning, as noted by Boyer & Ehri (2011) and Ehri (2013). If such tactile approaches are further enriched with gamification, the benefits can become manifold, rendering the latter a highly effective technique for teachers in their endeavor to ensure spelling mastery.

Effectivity due to Ease of Manipulation

This theme is described as the view of strategy as helpful in the way students perceive it due to the ease with which one can manipulate the materials. The participants repeatedly indicated during the research that the

strategy "really helped me how to spell words" and "helped me develop my skills." Furthermore, the physical arrangement of the tiles facilitated better visualization and understanding of the structure of words, while P7 supported this, saying, "It helps figure out which letters go together." Moreover, with easy manipulation, students can visually see the components of words and quickly correct their spelling. Approaches that allow students to manipulate letters and words physically can make abstract concepts of phonemic blending and segmentation more concrete and tangible, thereby making them more accessible. Pullen & Lane, 2016). As P11 noted, "It allowed me to see the letters and easily change the spelling if it was wrong." Research has shown that the use of tiles or blocks with letters enables students to visually depict the letters and then phonetically provide the sound, which helps enhance word-letter association. Besides enhancing phonemic awareness, research has suggested that manipulability with ease, as provided by tactile materials such as letter tiles or blocks, makes spelling activities easier to enjoy and access. As one of these studies mentioned, "letter tiles hold a child's attention," thereby enabling them to "focus on the learning at hand" (Rippel, 2021). The results show that manipulative spelling instruction using letter tiles can effectively capture students' improvement in spelling skills by presenting word structures more concretely. This will surely enhance not only phonemic awareness but also make the learning process more interactive, leading to better retention and application of spelling concepts.

Digital Strategy

Fun Factor in Gamification Aids in Remembering

The participants consistently described the digital strategy as "fun," "enjoyable," and engaging, primarily due to the use of familiar technology presented in a game-like format. The participants mentioned that this strategy was more enjoyable because it included games (P4), and they felt like playing an online game while also learning (P6). The interactive element of the game was seen as a positive aspect, especially since the participants were already familiar with using devices like iPads or tablets, and they felt that "it is easier to navigate" (P3). As P5 expressed, "Most Grade 6 students are more used to using gadgets, and it is fun." The enjoyable experience not only made the learning process engaging, but it also appeared to enhance the student's ability to remember word spellings. P4 stated, "It uses online games, which helped me remember. When things are fun, you can remember them more, including the spelling of the words." Rippel (2021) expresses that "When students are enjoying the learning experience, the information is more likely to be encoded and stored in their long-term memory." These results suggest that creating a fun, interactive, and multisensory learning environment can be a helpful tool for heightening the engagement, attention, and focus of today's learners, who are accustomed to using technology in their daily lives.

Helpful Challenge

Albeit challenging, the participants testify that this strategy is effective in developing their spelling skills, particularly in the context of unscrambling and spelling challenging words. One reported that it "helped me unscramble words and figure out how to spell them. (P7) The most famous challenge was unscrambling the words, but that was perceived as a positive aspect because it allowed some fun and interactivity into the teaching process itself. According to one of the participants in a research study, "the digital strategy helped unscramble words that had been misspelled and correct them entirely," providing immediate feedback and reinforcement. This mix of challenge, interactivity, and immediate feedback will make learning more memorable, thereby helping students retain their spelling knowledge. One student summed it up this way: "Sometimes the words had odd spellings that added to the challenge and made it more fun." As another person added, "The digital strategy helped me unscramble hard-to-spell words, which developed my spelling skills." These judgments imply that the digital approach not only provides a fun and engaging way to learn to spell but also offers rigorous yet helpful activities that can enhance students' skills and even boost their confidence in their spelling abilities. By leveraging the engaging and interactive nature of technology, educators can create learning experiences that enhance student motivation, memory retention, and overall spelling skill development.

Motivation in Ranking System

The participants found the ranking system employed in this strategy to be an enjoyable and motivating feature. Participants noted that the strategy was "fun because there was a ranking system. (p. 10) This engages them in seeing who scored the highest or lowest. (P12) The competitive element introduced by the ranking system appears to have enhanced not only the fun factor but also the motivation of students to perform well. The motivational elements of the ranking systems and point-based rewards can help maintain the attention and investment of

students who may struggle with more traditional, teacher-directed instruction, providing a more enjoyable and rewarding learning experience (Pennington, 2015; Rippel, 2021). The activities that introduced a sense of challenge or competition likely helped these students remain focused and, in turn, showed their investment in spelling activities. Such findings suggest that the ranking system can be a potentially successful inclusion in the gamification elements of the digital intervention, enabling students to enjoy the activities more and motivating them to develop their spelling skills.

Phonetic Strategy

Chunking Based on Syllables/Sounds

The results of this study demonstrate the effectiveness of chunking words into syllables and individual sounds as a strategy for enhancing spelling skills. Indeed, participants consistently reported that breaking words into smaller, more manageable "chunks" helped them better understand and apply spelling concepts. This perspective was further shared by P7, "Chunking the words helps me divide them to know how to spell them and develop my spelling skills." Similarly, Pullen and Lane (2016) say that by segmenting words into their respective phonemes or syllables, such approaches make abstract concepts of phonemic blending and segmentation tangible and achievable. Chunking words by syllables enables learners to recognize meaningful patterns organized around vowel sounds, thereby helping to develop phonological awareness, which is essential for both reading and spelling. Similarly, the segmenting and manipulating of individual sounds within a word. As P12 explained, "helps me to know the spelling." Such segmentation and manipulation of sounds support students' knowledge of Grapheme-Phoneme Correspondences (GPC) and lead them to apply their learning to new words. Furthermore, P9 explained, "The dots depend on the syllables or if there are smaller words within the word." This leads to an awareness of how chunking sometimes will expose smaller words to larger ones. Phonetic strategies, when combined with chunking, can render structured and systematic content both more palatable and enjoyable to students, therefore significantly improving their spelling capabilities.

Effectivity in Learning About a Word

In this part, participants consistently stated that this strategy is the most effective one for them, noting that it teaches them syllables, pronunciation, and spelling in a clear and structured way. Since the chunking method involved breaking down words into simpler ones, it was praised for its simplicity and usefulness, with one student stating, “Chunking the words by syllable, rather than just focusing on one part, was very helpful. (P7)” Chunking will also allow the participants to "know the word more deeply" by understanding how syllables interact with each other. Dymock and Nicholson continue to suggest that phonetic strategies have also been shown to be effective in reinforcing spelling skills and facilitating the transfer of learning to new words. The phonetic strategy also requires adherence to "rules that were very simple and laid out, which allowed me to do it quickly, (P11)", making it more accessible and quicker to learn and apply. Participants also found chunking makes it "easy to know the spelling," and this is a strategy that best suits them to indicate its effectiveness in supporting participants' individual learning needs. These findings, therefore, indicate that the chunking method of teaching syllables, pronunciation, and spelling is among the most effective methods for students, as its simplicity and structured approach enhance understanding of word interactions and address the learning needs of each student to master spelling skills in a faster and more profound way.

Liberty to Divide Words

This theme highlights how this approach gives students a significant amount of autonomy and flexibility in the way they chunk and manipulate words. P1 commented that this approach enabled the students to "chunk a word on my own according to its pronunciation" rather than having one set method drilled into them. As one student further commented, "The chunking technique is interesting because I can chunk words in many different ways. (P2) The actual ownership of the chunking process seemed to be an empowering aspect of this phonetic strategy for themselves. Pullen and Lane (2016) state, "The freedom to chunk words in a manner that has meaning for them empowers students to use phonics knowledge more effectively." This freedom to experiment and find their ways to chunk words effectively likely gave them a sense of ownership in their learning process. These findings also confirm that given an opportunity, students will interact with spelling in a manner consistent with their unique learning preferences and strengths. If allowed to apply these rules and patterns in meaningful ways, this approach has the potential to provide the student with a toolset of approaches that can be generalized to a large number of words.

Lowlights

Tactile Strategy

Difficulty in Finding the Letters

This downfall, created by Tactile Strategy, involved searching for letters in a Scrabble set. They cited that "finding the correct letters to make the words (P8)" or "finding the letters in the Scrabble set (P12)" appears to be a challenge, given that letters were often hard to find quickly. One noted that "the teacher says the word, and I have to unscramble the letters" (P12), adding a complication over and above pure spelling. As Rippel (2021) mentioned, this difficulty can be particularly pronounced for students with limited fine motor skills or those who are not accustomed to working with physical manipulatives. Some participants also expressed concerns that "some blocks get lost, and it would not help" (P6), indicating that the potential drawbacks of the tactile materials could be significant if not correctly managed. In addition, the time required to set up the tactile activity often caused the teacher to start before the students were ready, leading to frustration. The participants remarked that they "kept looking for the letters, but it consumed much time" and that sometimes, "we could not flip them quickly." These limitations can undermine the overall impact of the tactile approach, as students may not be able to fully engage with the material due to physical constraints. Thus, educators should be aware of this limitation and consider alternative strategies to ensure that all students have equal opportunities to succeed in spelling instruction.

Limited Number of Letters

Another key theme that emerged in this study is the potential drawback of this strategy due to the limited number of available letters, particularly less common letters like X and Z. P2 highlighted that with "two of each letter", it was often "hard to find the ones needed." This leads to a word with "missing letters because there were so few available (P3)". This scarcity of letters led the students to "improvise by using alternatives, such as turning an N upside down for a Z" (P3). Working in partners intensified the problem, for "I cannot have the same letter as my partner (P3)" and "sometimes, my seatmate would form the word very fast. (P13)" This can be particularly problematic for students who require more targeted, individualized support (Adewunmi, 2023). This lack of individual access to the tiles can undermine the hands-on, multisensory benefits that make tactile strategies effective in the first place. If students are not able to actively manipulate the letters, they may not be as engaged or motivated to learn. Overall, the issue of letter availability should be considered when using this strategy to ensure that students can fully engage with the spelling activities without being deprived of equal opportunities due to a lack of necessary materials.

Level of Difficulty

This theme is evident in how, for some participants, it was "a little bit harder than the other strategies" (P10). As one study demonstrated, "The tactile strategy was less effective for students who struggled to manipulate the letter tiles or blocks, and it generalized poorly to untrained words" (Rippel, 2021). The fact that this might be limiting could reduce the overall effectiveness of the tactile strategy. In light of this, some participants suggested that the teacher should also review the words to be added so that an appropriate level of difficulty could be considered. In addition, P13 has said that "adding different levels" would better define the challenge and allow for considering students of differing spelling abilities. This multi-level Tactile Strategy can be beneficial in maintaining students' interest and catering to their learning needs, considering their varying capabilities, from basic spellers to proficient spellers. Given this fact, teachers can maximize the value of this activity, knowing that no individual child will be excluded from this classwork due to their spelling skill level.

Digital Strategy

Random Tapping or Placement of Letters

Another possible weakness of the strategy was that it would allow students to "tap random letters to form words" (P1). As P2 said, they can "randomly place letters until they get the word correct, w/o thinking." Another weakness was "spamming the buttons and clicking random ones (P8)" as this may result in getting the correct answer without knowing the spelling. This confirms that the ease of accessing information and tools, such as spell-check and autocorrect, on digital platforms can lead to a phenomenon known as Cognitive Offloading (Risko & Gilbert, 2016). This can reduce students' active engagement with the spelling process and their development of independent word analysis strategies. With this, participants recommended implementing a security system where kids cannot tap random letters (P1) and suggested features like a limited number of 'lives' or attempts,

where students would be 'knocked out' (P12) if they made too many incorrect guesses. This would encourage more thoughtful engagement with digital activities and prevent students from simply "cheating very fast (P13)" by clicking rapidly. Due to the impact of technology, students do not always recognize the importance of truly understanding the English language (Purcell et al., 2013), implying that learning spelling, grammar, and sentence structure is unnecessary because technology can do the task for them (Bromley, 2010; Purcell et al., 2013; Alhusban, 2016).

Technical Issues

Another downside of this strategy, as highlighted by the participants, is the occurrence of technical problems, such as internet issues and trouble logging in or out of accounts. (P3) Technical issues, such as software glitches, system crashes, or unreliable hardware, can directly interfere with the learning process, frustrating students and thereby undermining the potential benefits of digital game-based learning (Nadeem et al., 2023). Furthermore, P6 mentioned that "the only potential challenge was if the link was not working," highlighting the importance of ensuring that all digital resources are accessible and functional. If students repeatedly encounter technical problems during game-based learning activities, it can diminish their interest and motivation to participate.

Anagrammatic Words

The majority of the participants also emphasized a downside of the Digital Strategy in terms of Anagrammatic Words, mainly described as a word that can form another or many words using the same letters. As P5 stressed, "The challenge was having a hard time figuring out what the words were," suggesting that the process of unscrambling the letters and identifying the correct word was more difficult in the digital format. P14 also mentioned that the strategy was "difficult for me, and I do not like it because I had to apply various alphabets." Indicating that the need to manipulate and rearrange letters on a digital platform was not preferred. This process places additional cognitive demands on students, as they must manipulate and rearrange letters to identify the correct word (Ehri, 2005; Treiman, 2017). These comments highlight that while technology can provide engaging and interactive experiences, some students may struggle with tasks that require higher-level word analysis and decoding skills in a digital context. Students who struggle with these foundational skills may find tasks involving anagrammatic words particularly challenging, even in a digital context (National Reading Panel, 2000).

Level of Difficulty

In this strategy, some participants also felt that the level of difficulty could be improved to better challenge the students. Suggestions included 'including more challenging words, such as" onomatopoeia, "so students can practice spelling them (P7)' and 'making them more difficult.' (P8)" P9 also expressed that "I did not find the Digital Strategy challenging." This is supported by a study that states, "Tasks that are neither too easy nor too difficult tend to be the most effective for learning" (Vygotsky, 1978; Csikszentmihalyi, 1990; Chaiklin, 2003; Hong & del Busto, 2020). When activities are too easy, students may become bored and disengaged, limiting the potential for skill development. P13 felt that this strategy "became too easy, and I no longer learned anything from it." To address this, P14 recommended "having different levels" of difficulty, which "may help improve my spelling skills and ability to remember spellings." Providing digital strategies with multiple levels of difficulty can help ensure that all students are appropriately challenged and can progress at their own pace (Tomlinson, 2014).

Phonetic Strategy

Single or Multiple Syllables

In this strategy, some participants encountered challenges when dealing with words that did not form the expected patterns due to the number of syllables present in a word. The primary issue highlighted was "not knowing if a word has one or more syllables, (P1)" which made it challenging to apply the chunking method effectively. P3 mentioned, "The main problem in Phonetics is trick questions (words) that do not require chunking." According to (Treiman & Kessler, 2014), "some words do not follow the expected syllable patterns or may have unexpected syllable divisions," resulting in some participants expressing "difficulty in separating the syllables, (10)" even for words that did have multiple divisions. Through these findings, it can be stated that educators should also be mindful of incorporating a range of word types, including single-syllable words and words with irregular or unexpected syllable structures. Providing practice on identifying the number of syllables in a word and strategies for handling words that do not fit the typical chunking pattern may help address these challenges and ensure that students can fully benefit from this approach.

Level of Difficulty and Effectivity

In this strategy, most students expressed that "there is not much challenge in the chunking technique" (P10), suggesting that this strategy may have been too simplistic for some learners. P3 further suggested "inclusion of more challenging words which are difficult to chunk into syllables" and "longer words so that students have a bigger challenge in chunking them. (P7)". Whereas P4 added that it was "simple but less enjoyable" and just "similar to the old way of writing words, (P9)", suggesting that maybe the technique was not that interesting or novel compared to the other strategies. Research documented that the difficulty level of words within the phonetic strategy impacts its effectiveness and level of engagement (Ehri, 2005; Graham & Santangelo, 2014). P4 also added that this strategy was "not as effective as normal spelling" for those who "know the words already". Hence, it might suggest that although chunking was perceived as easy and straightforward to use, the total lack of challenge and engagement in this method may reduce its effectiveness for some learners, and it should incorporate more complex words to enhance both motivation and learning outcomes.

Silent or Double Letters

Some also experienced problems with words with silent or double letters: "My only problem was that sometimes these words were awkward to repeat because they included silent letters," said P11. This suggests that the unusual letter combinations made chunking these words into syllable units problematic. This "separating syllables" problem indicated that chunking was less effective for the monosyllabic words. This may be due to the complex nature of the English language's orthographic system. Many words have letter patterns that do not align with the typical phonetic rules. (Treiman, 1993; Venezky & Wagner, 1999; Treiman & Kessler, 2014). To address the challenge, participants recommended "additional things to be added, such as signs or the teacher explaining silent letters" (P11), emphasizing the need for explicit instruction on letter patterns that do not follow typical phonetic rules. If addressed, educators can help the student navigate the complexities of the English language and apply the chunking technique more effectively, even when encountering words with silent or double letters.

3.3 Combination with Other Strategies

This study also highlights the benefits that arise from combining these strategies. The participants noted that combining strategies can be beneficial, as incorporating tactile strategies with other approaches enables students to benefit from both methods (P11). For example, when tactile is combined with phonetic strategy, which involves breaking words into chunks, it can "make it easier in some situations because they are somewhat similar, allowing you to use both at once to spell and fix words" (P7). Moats (2005) and Birsh (2018) even mentioned that combining tactile strategies, such as using letter tiles or blocks, with other approaches allows students to engage multiple senses, reinforcing the concepts learned through phonics instruction.

Similarly, combining digital strategy with other approaches, such as utilizing both auditory and visual features like hearing the word chunked and seeing it presented digitally, "may help me understand more and see what would happen (P11 According to Mangen (2013) and Shamir & Korat (2015), "the combination of digital strategies with other approaches, like the use of both auditory and visual features, can lead to fuller comprehension and retention of spelling concepts in students.

Participants also noted that integrating phonetic strategy with tactile strategy provided an outlined framework through which word structure and pronunciation are learned. At the same time, the hands-on, multisensory nature of the tactic heightened the concepts learned through the phonics instruction. This helped students "really learn how to spell" (P3). This evidence highlights the effectiveness of a multimodal approach to spelling instruction, which engages students' senses while providing explicit phonics instruction and offering practice opportunities in both hands-on and digital formats.

Research has suggested that multi-faceted strategies and activities for spelling instruction create student motivation and engagement more robustly than single-instruction curriculum design (Patall et al., 2010; Gambrell, 2011). By engaging students' senses, providing them with structured frameworks, and differentiating teachers' support, they will develop robust spelling skills and a solid foundation to support them throughout their lifelong literacy.

4.0 Conclusion

It is thus concluded from this study that the different interventions to which the Grade Six students are exposed result in a variation in their performance records. The Phonetic Strategy was found to be the to be most effective, resulting in *Outstanding* performance. Given the superior effectiveness of the Phonetic Strategy, as evidenced by significantly higher mean spelling scores ($p < 0.001$), this study underscores the critical importance of prioritizing and strengthening phonics-based instruction in elementary spelling curricula. Meanwhile, the Digital Strategy achieved satisfactory performance, and the Tactile Strategy yielded reasonably satisfactory results. Highlights for the Tactile Strategy include a fun factor in gamification effectivity due to ease in manipulation, while the Digital Strategy includes a fun factor in gamification aids in remembering, helpful challenge, and motivation in the ranking system; and the Phonetic Strategy includes chunking based on syllables/sounds, effectivity in learning about a word, and liberty to divide words. While the Tactile and Digital Strategies offered certain benefits, particularly in terms of engagement and motivation, their limitations suggest that they should be considered supplementary tools rather than primary methods for spelling instruction. Lowlights for the Tactile Strategy include difficulty in finding the letters, a limited number of letters, and level of difficulty, while the Digital Strategy includes random tapping or placement of letters, technical issues, and anagrammatic words; and for the Phonetic Strategy includes single or multiple syllables, level of difficulty and effectivity, and silent or double letters. Moving forward, future research should investigate how to effectively integrate elements of gamification and personalized learning, as observed in the Digital and Tactile strategies, into the phonics-based approach to enhance engagement and cater to diverse learning styles without compromising instructional efficacy. This might involve designing digital phonics games or incorporating tactile manipulatives to reinforce phonetic concepts.

5.0 Contributions of Authors

Mary Eugenie Joy C. Orozco led the conceptualization and design of the study, oversaw data collection and analysis, wrote and edited the manuscript, and provided overall supervision of the research.

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7.0 Conflict of Interests

The author indicates that she has no conflict of interest.

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