

The Level of Spelling Proficiency Skills of Grade 2 Learners in Darigayos Elementary School: Master V.I.N.C.E.'s Interactive Game-Based Materials

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Abstract

This study determined the spelling proficiency skills of Grade 2 learners at Darigayos Elementary School and developed Master V.I.N.C.E.'S Interactive Game-Based Materials as intervention materials based on identified learning gaps. The study was anchored on Multisensory Learning Theory, Constructivist Theory, Vygotsky's Sociocultural Theory, Paivio's Dual Coding Theory, Behaviorist Theory, and the Input–Process–Output Model. It employed a quantitative one-group pretest–posttest quasi-experimental design involving 25 Grade 2 learners from Grade 2 Dahlia and Grade 2 Daisy during School Year 2025–2026. A researcher-made spelling test was used to measure phonemic awareness, phoneme–grapheme correspondence, orthographic knowledge, and word encoding accuracy before and after the six-week intervention. Data were analyzed using mean, standard deviation, frequency, percentage, and paired sample t-test. Findings showed that learners obtained a pretest mean score of 4.20, interpreted as Low, indicating weak spelling proficiency before the intervention. After the implementation of game-based and manipulative-based spelling strategies, the posttest mean increased to 9.08, interpreted as Very High. The paired sample t-test yielded a computed t-value of -13.65 with a p-value of 0.00, confirming a significant difference between pretest and posttest scores. The study concluded that Master V.I.N.C.E.'S Interactive Game-Based Materials effectively improved learners' spelling proficiency through visual, interactive, tactile, collaborative, and experiential learning activities. It recommended the integration of game-based and manipulative materials in classroom spelling instruction, teacher training, curriculum planning, home reinforcement, and further studies with larger samples. The study supports SDG 4, Quality Education, and SDG 10, Reduced Inequalities, by promoting accessible and learner-centered literacy support. Its sustainability impact lies in strengthening educational, institutional, and socio-economic sustainability through low-cost, localized, and adaptable instructional materials for public elementary schools.

Keywords: Early Literacy, Game-Based Learning, Grade 2 Learners, Intervention Materials, Manipulative-Based Strategies, Multisensory Instruction, Spelling Proficiency

1. Introduction

Spelling proficiency is a foundational component of early literacy because it connects reading, writing, phonological awareness, vocabulary development, and written communication. For Grade 2 learners, spelling is particularly important because they are transitioning from basic phonics to more complex literacy tasks such as reading longer texts, constructing sentences, and writing short paragraphs. However, spelling remains a persistent difficulty among young learners, especially when they struggle with phoneme–grapheme correspondence, orthographic patterns, and word formation. This study focuses on the spelling proficiency skills of Grade 2 learners in Darigayos Elementary School and the development of Master V.I.N.C.E.'S Interactive Game-Based Materials as localized intervention materials designed to address identified spelling gaps through multisensory, game-based, and manipulative-based strategies.

Spelling serves as a critical link between reading and writing. In the early elementary years, learners begin to establish sound–letter relationships while developing the ability to decode words, comprehend texts, and express ideas in written form. Recent studies emphasize that spelling proficiency supports reading fluency, vocabulary development, and written communication, while persistent spelling difficulties may negatively affect learners' academic performance and self-confidence (Kim et al., 2020; Graham & Santangelo, 2021). Globally, research from 2020 to 2025 shows that spelling remains challenging for young learners because many still struggle with phoneme–grapheme correspondence, orthographic patterns, and emerging morphological awareness. According to Treiman and Kessler (2022), learners often find it difficult to apply phonics knowledge to spelling tasks when instruction focuses mainly on rote memorization rather than conceptual understanding. Similarly, Joshi et al. (2021) reported that traditional spelling methods often fail to address learners' individual needs, resulting in limited long-term retention and transfer of skills. Contemporary literacy research increasingly supports multisensory approaches in spelling instruction. Multisensory learning engages visual, auditory, tactile, and kinesthetic modalities to support deeper cognitive processing. Studies show that multisensory instruction enhances spelling

accuracy, phonological awareness, and learner engagement in the primary grades (Sadoski & Paivio, 2021; Denton et al., 2023). Manipulatives such as letter tiles, word cards, magnetic letters, and word-building kits are especially useful because they allow learners to physically construct words, test sound–letter combinations, and self-correct spelling errors. Mentink (2022) explained that manipulatives transform abstract linguistic concepts into concrete learning experiences, while Gillespie (2024) found that word boxes and letter manipulatives improve spelling accuracy by strengthening phonological processing and orthographic mapping. Schrodt et al. (2024) also reported that tactile spelling activities support invented spelling and phonemic segmentation skills.

The related literature consistently recognizes spelling as a core literacy skill because it supports reading fluency, written expression, and academic success. According to Kilpatrick (2021), spelling contributes to orthographic mapping, which enables learners to store written words in long-term memory by connecting sounds, letters, and meanings. Snow and Matthews (2022) emphasized that early spelling mastery contributes to long-term academic achievement because learners with strong spelling skills are more capable of organizing ideas, comprehending texts, and communicating effectively. Despite its importance, spelling remains difficult for early-grade learners because they are still developing phonemic awareness and phoneme–grapheme correspondence. Hall et al. (2022) explained that young learners commonly experience letter reversals, omitted sounds, incorrect vowel representations, and invented spelling patterns due to incomplete orthographic knowledge. Traditional spelling instruction, especially rote memorization and repetitive copying may support temporary recall but often fails to establish long-term retention and conceptual understanding. Foreign and local studies support manipulative-based instruction because it makes spelling more concrete, interactive, and meaningful. Mentink (2023) explained that manipulatives such as magnetic letters, alphabet tiles, flashcards, movable word strips, and sound boxes allow learners to construct and deconstruct words physically. Gerde et al. (2023) found that concrete scaffolds reduce the cognitive burden associated with handwriting, allowing learners to focus more on phonemic patterns and spelling structures. Graham et al. (2024) emphasized that tactile “touch-and-spell” activities provide immediate sensory feedback that helps learners recognize word structures and spelling patterns more effectively. The cognitive basis of spelling instruction also supports multisensory and manipulative-based strategies. Kilpatrick (2021) explained that orthographic mapping becomes stronger when learners hear sounds, see letters, pronounce words, and manipulate language components. Hall et al. (2022) reported that learners who engaged in tactile letter-sound integration activities demonstrated higher retention in spelling irregular words compared to learners exposed to traditional “look-cover-write-check” approaches. Mayer (2020) also stated that learners understand and retain concepts more effectively when information is processed through multiple sensory channels simultaneously.

International studies show that multisensory spelling interventions support learners at risk of literacy difficulties. Salvador et al. (2024) found that multisensory spelling interventions were particularly effective for learners with weak phonological skills because they provide multiple pathways for reinforcing sound–symbol connections. McNeill and Kirk (2023) likewise emphasized that hands-on spelling activities promote learner motivation and engagement, which are essential for sustaining literacy progress in the early elementary years. In the Philippine context, studies from 2020 to 2025 support the use of multisensory and manipulative-based spelling instruction. Alagenio et al. (2024) reported significant improvements in spelling accuracy among elementary pupils who used letter blocks during spelling lessons. Orozco (2025) concluded that tactile and phonetic spelling strategies are effective and practical in public schools, especially in classrooms with limited technological resources. Jison (2025) found that structured spelling interventions improved Grade 2 learners’ spelling performance, while Acebedo et al. (2025) noted that interactive and multisensory strategies produced better learning outcomes than purely paper-based activities. Local studies further emphasize the need to assess spelling gaps before designing interventions. Incognito et al. (2023) found that word awareness and phonemic recognition significantly influence spelling performance among Grade 2 learners. Cullamar and Maghuyop (2024) explained that many pupils in Philippine public schools experience difficulty mastering orthographic patterns due to limited exposure to interactive literacy instruction. Orozco (2025) also noted that memorization-based spelling instruction often fails to produce long-term retention because learners are not actively engaged in the learning process. At Darigayos Elementary School in Luna, La Union, the researcher observed that many Grade 2 learners experience difficulty spelling basic words, applying sound–letter relationships, spelling unfamiliar words, and writing complete and accurate sentences. These difficulties are further affected by the learners’ transition from the Mother Tongue-Based Multilingual Education program, as many learners struggle to adjust from the phonetic consistency of their native language to the irregular spelling patterns of English. The baseline spelling profile revealed that 12 learners failed the 10-item spelling activity, 8 barely reached the passing mark, and only 5 demonstrated high proficiency, showing a clear need for targeted spelling intervention.

The study is grounded in Multisensory Learning Theory, Constructivist Theory, Vygotsky’s Sociocultural Theory, Paivio’s Dual Coding Theory, and Behaviorist Theory. Multisensory Learning Theory posits that learning becomes more effective when visual, auditory, tactile, and kinesthetic senses are engaged simultaneously. Learners retain information better when they can see, hear, touch, and manipulate objects (Kucirková, 2023). In spelling instruction, this supports the use of manipulatives that allow learners to connect phonemes with graphemes through hands-on activities. Research indicates that multisensory approaches improve spelling accuracy and cognitive engagement among young learners (Kunasegran &

Subramaniam, 2024). Constructivist Theory emphasizes that learners actively build knowledge rather than passively receive information (Bruner, 1991). Manipulatives allow learners to construct words, manipulate letters, and discover spelling patterns independently or collaboratively. Hand et al. (2024) found that pupils who actively manipulate letters or word cards demonstrate better spelling mastery than those who rely only on rote memorization. Vygotsky's Sociocultural Theory highlights social interaction, guidance, and the Zone of Proximal Development in learning (Vygotsky, 1978). In manipulative-based spelling activities, teachers scaffold learning by modeling letter arrangements, prompting learners to sound out words, and providing corrective feedback. Peer collaboration also supports spelling development by allowing learners to check and construct words together. Paivio's Dual Coding Theory proposes that learning improves when information is processed through both verbal and non-verbal channels (Paivio, 1986). Manipulatives support this process because learners articulate letter sounds, read words aloud, physically manipulate letters, and visualize word structures. Recent studies confirm that multisensory and tactile approaches using manipulatives improve early literacy outcomes (Lin et al., 2025). Behaviorist Theory emphasizes reinforcement, repetition, and feedback in skill acquisition (Skinner, 1953). Spelling proficiency develops through repeated practice and immediate correction of errors. Manipulatives provide instant visual feedback that allows learners to self-correct, while teachers reinforce correct responses through praise and additional practice. Sénéchal et al. (2024) demonstrated that repeated, scaffolded manipulative activities enhance spelling automaticity and accuracy among early elementary learners.

Conceptually, the study is anchored on the Input–Process–Output Model. The inputs include the learners' spelling skills before and after the use of spelling strategies and the significant difference between pretest and posttest performance. The process involves analysis and interpretation of these spelling results. The output is Master V.I.N.C.E.'S Interactive Game-Based Materials, which are intended to improve spelling performance through guided, activity-based, and learner-centered instruction.

The reviewed literature confirms that spelling is essential to reading, writing, communication, and academic success. Foreign studies emphasize orthographic mapping, multisensory integration, dual coding, and tactile learning, while local studies emphasize contextualized, low-cost, and teacher-made intervention materials suited to Philippine public schools. Aspiranti et al. (2024) found that Word Box interventions improved learners' ability to recognize letter placement patterns and correct spelling errors. Alagenio et al. (2024) reported that letter block interventions increased spelling accuracy and motivation among Grade 2 pupils. Jison (2025) concluded that tactile learning tools remain practical and sustainable instructional alternatives in Philippine public schools where digital resources are limited. Local literature also supports contextualized learning materials. Dela Cruz (2023) observed that localized manipulatives made from recycled and indigenous materials make learning more culturally meaningful, engaging, and accessible in rural schools. Bautista and Santos (2022) found that low-cost tactile kits made from cardboard, bottle caps, and sand trays produced better spelling outcomes than digital applications in areas with unreliable internet connectivity. Villanueva (2024) emphasized that teacher-made manipulatives provide flexibility because teachers can modify activities based on learners' specific spelling difficulties. Pascua (2024) further emphasized that post-pandemic learning disruptions affected foundational literacy skills, particularly spelling, decoding, and reading fluency. Despite these findings, limited research has focused specifically on designing customized intervention materials based on the assessed spelling proficiency profiles of Grade 2 learners in rural Philippine contexts. Most existing studies focus on general literacy instruction rather than targeted spelling interventions grounded in actual learner assessment data. This study addresses that gap by using the spelling proficiency profiles of Grade 2 learners at Darigayos Elementary School as the basis for developing customized, contextualized, and developmentally appropriate intervention materials.

This study directly aligns with SDG 4 – Quality Education because it aims to strengthen foundational literacy through inclusive, learner-centered, and developmentally appropriate spelling intervention materials. By developing low-cost, accessible, and localized instructional materials based on learners' actual spelling needs, the study supports equitable learning opportunities for young learners in a public elementary school setting. UNESCO (2023) explained that frugal innovation in education involves creating practical, sustainable, and affordable instructional solutions using locally available materials and resources. The study also supports SDG 10 – Reduced Inequalities because it promotes low-cost, high-impact intervention materials for learners in rural or resource-limited environments. Teacher-made manipulatives such as cardboard letter tiles, bottle-cap word builders, laminated flashcards, and movable sound chips can help address learning gaps without requiring expensive technology. In this way, the study contributes to reducing literacy-related learning inequalities by making spelling intervention more accessible to struggling learners.

The study contributes to educational sustainability by strengthening early literacy instruction through practical, localized, and evidence-based intervention materials. It supports learners by addressing weaknesses in phonics, word formation, and letter sequencing through engaging, multisensory activities. It supports teachers by providing a diagnostic basis and a practical instructional toolkit that moves beyond rote memorization toward visual, auditory, tactile, and kinesthetic learning. The study also contributes to socio-economic and institutional sustainability by promoting low-cost instructional materials that can be implemented in public schools with limited technological and financial resources. Instead of depending on expensive digital tools, the intervention uses accessible, teacher-made, and context-responsive materials that

can be adapted by teachers, supported by school administrators, and reinforced by parents at home. Through this approach, the study strengthens community-based literacy support, improves instructional practice, and advances inclusive quality education for young learners.

2. Material and methods

2.1 Research Design

The study used a quantitative one-group pretest–posttest quasi-experimental design to assess the effectiveness of game-based and manipulative-based spelling activities. The same group of learners took a pretest to determine baseline spelling proficiency and a posttest after the intervention to measure improvement. This design was appropriate because random assignment was not feasible in the classroom setting and allowed the researcher to compare learners' performance before and after the intervention (Creswell & Creswell, 2021; Cranmer, 2021; Choueiry, 2022). The instructional materials served as the independent variable, while spelling accuracy served as the dependent variable, consistent with studies emphasizing the usefulness of this design in classroom-based literacy research (Gay, Mills, & Airasian, 2022; Tabieh et al., 2021; Duran & Aquino, 2024).

2.2 Locale of the Study

The study was conducted at Darigayos Elementary School in Barangay Darigayos, Luna, La Union. The school was selected because it was accessible to the researcher and served as the site where the intervention was implemented. The school administration and faculty also showed willingness to cooperate in the six-week intervention program. The locale represented a typical public elementary school setting, with learners coming from varied socio-economic backgrounds and from both the local barangay and nearby municipalities.

2.3 Respondents of the Study

The respondents were the Grade 2 learners of Darigayos Elementary School enrolled during School Year 2025–2026. The group consisted of 25 learners from Grade 2 Dahlia and Grade 2 Daisy. Specifically, 13 learners came from Grade 2 Dahlia, while 12 learners came from Grade 2 Daisy.

2.4 Sample and Sampling Procedure

The study used total enumeration because all 25 Grade 2 learners enrolled in the identified classes were included as respondents. This approach was appropriate because the population was small and manageable, allowing the researcher to include all qualified participants in the pretest, intervention, and posttest phases.

2.5 Research Instrument

The study used a researcher-made spelling test as the pretest and posttest instrument. The test consisted of grade-level appropriate English words aligned with the Grade 2 curriculum. It measured phonemic awareness, phoneme–grapheme correspondence, orthographic knowledge, and accuracy in encoding words. The study also used game-based spelling activities as intervention materials. These included traditional and ICT-integrated spelling activities designed to teach spelling patterns, blending, segmenting, and word formation. The traditional activities included Letter Order and manipulative-based spelling activities, while the ICT-integrated activity was Word Factory. These activities were used during the intervention sessions to provide learners with visual, tactile, and interactive spelling practice.

2.6 Data Gathering Procedure

The data gathering process began with the preparatory and ethical phase, where the researcher secured official approval from the school principal and the Division Superintendent. Written informed consent was obtained from the parents or guardians of participating learners, and an orientation was conducted with the fellow Grade 2 teacher to standardize the lesson implementation protocols. During the pre-intervention phase, the researcher administered the pretest to determine the learners' baseline spelling performance. The learners were also oriented on the use of manipulatives. After this, the six-week intervention was implemented through guided and independent game-based spelling sessions. The learners participated in activities such as Letter Order, Unscrambling Figures, Manipulative-Based Spelling, and Word Factory. These activities involved word-building, blending, rearranging, and phoneme manipulation. After the intervention, the posttest was administered using a parallel version of the spelling assessment. The pretest and posttest scores were compared to determine improvement in spelling performance. Observation data were also collected to supplement the quantitative results.

2.7 Data Analysis Techniques

The study used mean and standard deviation to describe the learners' spelling performance before and after the intervention. The learners' scores were interpreted using performance levels ranging from Very Low to Very High. A paired sample t-test was used to determine whether there was a significant difference between the pretest and posttest scores because the

two sets of scores came from the same group of learners. Frequency and percentage were also used to describe the distribution of the respondents. The results were interpreted at the 0.05 level of significance.

2.8 Ethical Considerations

The study observed ethical standards in conducting research involving young learners. Since the participants were Grade 2 pupils, written informed consent was obtained from their parents or legal guardians before data collection. The purpose, procedure, duration, and nature of the manipulative-based spelling activities were explained clearly. Verbal and age-appropriate assent was also sought from the learners to ensure that they understood their voluntary participation and their right to withdraw at any time without consequences. Confidentiality was maintained throughout the study. Codes or pseudonyms were used instead of learners' names during data recording, analysis, and reporting. Test results, worksheets, observations, and other research records were stored securely and were accessible only to the researcher and adviser. No identifiable information was included in the final manuscript. The intervention involved educational activities using instructional materials and posed minimal to no physical or psychological risk. The researcher ensured a supportive and non-threatening learning environment where no learner was embarrassed, compared negatively, or pressured based on performance. All activities were developmentally appropriate for Grade 2 learners and were coordinated with the classroom teacher to avoid disruption of regular instruction. The researcher also ensured honesty and accuracy in reporting the findings and complied with ethical guidelines for research involving minors under the Department of Education and institutional standards.

3. Results and Discussion

3.1 Spelling Proficiency of Grade 2 Learners

3.1.1 Spelling Skills Before the Use of Spelling Strategies

The pretest results showed that the Grade 2 learners obtained a mean score of 4.20, interpreted as Low. Most learners demonstrated weak spelling proficiency before the intervention, with 64% obtaining Very Low scores. Only 12% reached the High level, while 8% reached the Very High level. These results indicate that many learners had difficulty spelling grade-level words correctly, particularly in phoneme-grapheme correspondence, word formation, and recognition of spelling patterns. The low pretest performance suggests that the learners had limited mastery of foundational spelling skills prior to the intervention. This implies the need for structured, engaging, and developmentally appropriate materials that go beyond traditional spelling instruction. The finding is consistent with Incognito et al. (2023), who noted that spelling proficiency among early-grade learners is often limited due to insufficient mastery of sound-letter relationships. Similarly, Cullamar and Maghuyop (2024) found that many elementary pupils in Philippine public schools demonstrate low spelling performance when instruction relies mainly on rote memorization rather than interactive learning approaches. Orozco (2025) also emphasized that early-grade learners commonly experience spelling difficulties when instruction lacks multisensory engagement.

3.1.2 Spelling Skills After the Use of Spelling Strategies

The posttest results showed that the learners obtained a mean score of 9.08, interpreted as Very High. Compared with the pretest results, the learners demonstrated clear improvement after the implementation of spelling strategies. Learners who previously obtained Very Low and Low scores improved to Moderate and High levels, while 24% achieved Very High scores. This indicates better mastery of spelling skills after participating in the game-based and manipulative-based activities. The improvement shows that structured, interactive, and multisensory spelling instruction helped learners participate more actively in the learning process. The use of manipulatives such as letter tiles, word cards, and word-building activities allowed learners to see, hear, and physically manipulate letters while forming words. These findings support Multisensory Learning Theory, which states that learners retain information more effectively when multiple senses are involved. The results are consistent with Aspiranti et al. (2024) and Schrodtt et al. (2024), who found that multisensory spelling instruction significantly improves spelling accuracy among elementary learners. Alagenio et al. (2024) also reported that tactile learning tools such as letter blocks increased both motivation and spelling performance among young learners.

3.1.3 Significant Difference Between Pretest and Posttest Scores

The paired sample t-test results showed that the mean score increased from 4.20 in the pretest to 9.08 in the posttest. The computed t-value was -13.65 with a p-value of 0.00, which is lower than the 0.05 level of significance. This confirms a statistically significant difference between the pretest and posttest scores. Therefore, the null hypothesis stating that there is no significant difference in the spelling skills of Grade 2 learners before and after the use of intervention materials was rejected, while the alternative hypothesis was accepted. The significant difference indicates that the improvement in learners' spelling proficiency was not due to chance but may be attributed to the intervention materials. The game-based and manipulative-based materials supported active engagement, repeated practice, immediate feedback, and stronger retention of spelling patterns. This result supports Sénéchal et al. (2024), who reported that repeated practice combined with interactive learning activities enhances spelling accuracy among young learners. Likewise, Kunasegran and

Subramaniam (2024) emphasized that multisensory instructional approaches improve phonological awareness and spelling performance in early elementary education.

3.2 Development of Intervention Materials

3.2.1 Master V.I.N.C.E.'S Interactive Game-Based Materials

Based on the findings, the learners needed engaging, interactive, and developmentally appropriate materials to improve spelling proficiency. As a response, Master V.I.N.C.E.'S Interactive Game-Based Materials was developed. The acronym V.I.N.C.E. represents Visual, Interactive, Navigating, Collaborative, and Experiential learning approaches. The materials included Weaving Figures, Bayanihan Builders, and Dikit-Dikta, which were designed to support spelling development through visual, tactile, kinesthetic, collaborative, and interactive activities. The development of these materials was directly aligned with the learners' spelling needs. Weaving Figures supported visual recognition, phonics, spelling patterns, and word recognition. Bayanihan Builders allowed learners to construct words using letter cards, promoting kinesthetic engagement, letter sequencing, confidence, and participation. Dikit-Dikta encouraged learners to manipulate letters, form words, work independently or with peers, and strengthen letter-sound relationships. Overall, the materials provided a holistic approach to spelling instruction by integrating visual, kinesthetic, tactile, collaborative, and experiential learning strategies.

3.2.2 Structured Weekly Use of the Intervention Materials

The intervention materials were designed for organized weekly implementation. Each week, five target words were introduced and practiced through a structured schedule. Monday was allotted for the pretest to determine prior knowledge. Tuesday focused on Weaving Figures to strengthen visual recognition and spelling patterns. Wednesday used Dikit-Dikta to enhance kinesthetic recall. Thursday implemented Bayanihan Builders to promote collaborative learning. Friday was used for the posttest to assess learners' improvement and mastery of the target words. This structured schedule supports consistency in spelling instruction and ensures that learners receive repeated exposure to target words through varied learning modalities. The weekly sequence also allows teachers to assess baseline knowledge, provide guided practice, reinforce spelling through interactive tasks, and measure learning gains. Through this approach, Master V.I.N.C.E.'S Interactive Game-Based Materials may serve as a practical classroom tool for sustaining spelling improvement among Grade 2 learners.

4. Conclusion & Recommendations

The study concluded that the Grade 2 learners of Darigayos Elementary School had low spelling proficiency before the intervention, particularly in phoneme-grapheme correspondence, word formation, and recognition of spelling patterns; however, their spelling performance significantly improved after the implementation of game-based and manipulative-based instructional strategies. The integration of visual, auditory, tactile, interactive, and collaborative learning experiences helped learners retain and apply correct spelling patterns more effectively. The significant difference between the pretest and posttest results confirmed that Master V.I.N.C.E.'S Interactive Game-Based Materials was effective in improving the spelling proficiency of Grade 2 learners.

Teachers are encouraged to incorporate game-based spelling strategies and manipulative materials into classroom instruction to make spelling lessons more engaging and meaningful. School administrators may support this effort by providing training, workshops, and instructional materials that promote multisensory approaches to literacy instruction. Curriculum planners may consider integrating interactive and manipulative-based spelling activities into the elementary English curriculum, while parents may reinforce classroom learning through simple home-based activities such as word games, letter blocks, and spelling exercises. Future researchers may conduct similar studies using larger samples, longer intervention periods, or different grade levels to further examine the effectiveness of game-based spelling strategies in improving literacy skills.

The study was limited to the use of intervention materials for enhancing the spelling skills of Grade 2 pupils at Darigayos Elementary School during School Year 2025–2026, with spelling skills as the main variable of interest. Its findings were based on the performance of the identified Grade 2 learners within the specific school context, intervention period, and instructional conditions; therefore, broader application to other grade levels, schools, or regions may require further validation through studies with larger samples and longer implementation periods.

Compliance with ethical standards

The study complied with institutional ethical standards and the ethical guidelines for research involving minors by securing approval from the school head, fellow Grade 2 adviser, and the appropriate division or institutional research committee before implementation. Participation of the Grade 2 learners was voluntary, with informed consent obtained from parents or guardians and assent observed from the learners. Confidentiality was maintained by using data only for research

purposes, reporting results in aggregate form, and protecting the identities of the participants. The researcher ensured fairness, respect, non-discrimination, and a non-threatening learning environment throughout the intervention. The author declares no conflict of interest, acknowledges the contributions of school officials, teachers, learners, parents, and advisers, and affirms responsibility for the originality, accuracy, and copyright ownership of the research manuscript.

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