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The Impact of Sequential Spelling Instruction on Writing Fluency in Elementary ESL Students

Masandra Citra Ardila¹, Tiya Saputri², Edi Pujo Basuki³, Mujad Didien Afandi⁴

^{1,2,3,4} Faculty Of Teacher Training And Education, Universitas Nahdlatul Ulama Surabaya

¹4330022014@student.unusa.ac.id, ²tiyass@unusa.ac.id, ³ediyarga@unusa.ac.id, ⁴Dinosetro74@unusa.ac.id

Abstract

Writing fluency is an essential component of literacy development among elementary English as a Second Language (ESL) learners. However, many young learners experience difficulties in English spelling due to its irregular orthographic system, which often hinders writing accuracy and fluency. This study aimed to examine the impact of Sequential Spelling Instruction (SSI) on students' word-writing fluency and accuracy. A quantitative study employing a quasi-experimental one-group pretest-posttest design was conducted with 19 second-grade students at Wachid Hasyim Islamic Elementary School. Participants received a 12-week SSI intervention designed to improve spelling through explicit, sequential, and pattern-based instruction. Data were collected using writing pre-tests and post-tests, classroom observations, and students' writing documentation. Writing performance was assessed using Raw Writing Score, Words per Minute (WPM), and Correct Word Sequences (CWS). Descriptive statistics, paired t-tests, and ANCOVA were used to analyze the data. The findings demonstrated improvements across all writing measures following the intervention. The mean Raw Writing Score increased from 5.00 to 8.11, WPM improved from 1.67 to 2.70, and CWS increased from 2.00 to 3.00. The paired t-test indicated a statistically significant improvement in writing performance ($t(19) = -10.10, p < .001$), while ANCOVA confirmed that the positive effect remained significant after controlling for pre-test scores. These findings suggest that Sequential Spelling Instruction effectively enhances writing fluency and spelling accuracy among young ESL learners by reducing cognitive load during the writing process. The study highlights SSI as a promising instructional approach for improving early literacy development in elementary English classrooms.

Keywords: Sequential Spelling Instruction, Writing Fluency, Spelling Accuracy, English as a Second Language, Elementary School, Quasi-Experimental Design.

1. Introduction

Writing is a complex cognitive and linguistic process that enables individuals to communicate thoughts and ideas through visual symbols, including letters, punctuation, and spaces. Rather than being a simple mechanical activity, writing requires the coordination of multiple cognitive processes, such as fine motor skills, working memory, linguistic knowledge, and executive functions. From a neuropsychological perspective, these processes must operate simultaneously to produce coherent written texts. However, writing is widely regarded as one of the most difficult language skills to master because it requires learners to coordinate grammar, vocabulary, spelling, idea organization, and critical thinking simultaneously (Martin, 2017).

For many English as a Second Language (ESL) and English as a Foreign Language (EFL) learners, mastering writing is particularly challenging due to the nature of English orthography. English is classified as a language with a deep or opaque orthography, in which the relationship between phonemes and graphemes is highly inconsistent. Unlike languages with shallow orthographies, such as Indonesian or Finnish, where letters consistently represent the same sounds, English contains numerous irregular spelling patterns. A single sound may be represented by multiple letter combinations, while the same letter may produce different sounds depending on the context. Consequently, the transcription process—transforming ideas into written language—becomes a major obstacle for beginning learners and often limits both writing efficiency and clarity.

Writing accuracy is a fundamental component of effective written communication because it ensures clarity and precision in expressing ideas. Accuracy encompasses grammatical correctness, appropriate vocabulary selection, punctuation, and spelling (Ma & Zainal, 2018). For ESL and EFL learners, however, achieving writing accuracy remains an ongoing challenge. Accuracy-oriented instruction seeks to help learners produce error-free texts by emphasizing linguistic form and systematic revision (Alfalag, 2020). Nevertheless, previous studies indicate that language learners frequently struggle to balance writing fluency with linguistic accuracy. This challenge is

particularly evident among second-grade elementary school students who are transitioning from recognizing letters to constructing words and simple sentences. At this developmental stage, limited vocabulary and insufficient understanding of English spelling patterns often lead students to rely solely on phonetic spelling rather than established orthographic conventions. Without explicit spelling instruction, students frequently make errors involving vowels, double consonants, and morphological endings, which ultimately reduce writing quality and restrict their ability to express more complex ideas (Martin et al., 2020).

These challenges were also observed among second-grade students at Wachid Hasyim Elementary School. Preliminary classroom observations revealed that many students experienced considerable difficulty spelling English words accurately during writing activities. Students often hesitated when writing even simple vocabulary, resulting in slow, fragmented, and less fluent writing. Their primary difficulty involved mapping spoken sounds onto the correct sequence of letters, indicating limited mastery of English orthographic patterns. This situation reflects a broader issue in elementary education, where spelling is frequently treated as a skill acquired incidentally through reading, despite evidence suggesting that spelling requires explicit and systematic instruction. Furthermore, many students relied on rote memorization of weekly vocabulary lists but were unable to transfer this knowledge to authentic writing tasks such as free writing or creative composition. As a result, much of their working memory was consumed by determining correct spellings, leaving limited cognitive resources available for generating ideas, organizing sentences, and using varied vocabulary. This phenomenon, commonly referred to as a *transcriptional bottleneck*, directly restricts writing fluency (Kim et al., 2022).

Considering the urgency of this issue, the present study investigates the effectiveness of Sequential Spelling Instruction (SSI) in improving elementary students' writing performance. SSI is a structured instructional approach in which teachers explicitly model spelling patterns and guide students to write words sequentially according to phoneme-grapheme correspondences. Grounded in the principles of systematic literacy instruction, this approach is designed to strengthen orthographic knowledge while reducing the cognitive demands associated with spelling. As spelling becomes increasingly automated, students are expected to allocate greater cognitive resources to higher-level writing processes, thereby improving both writing fluency and spelling accuracy.

The theoretical foundation of this study is rooted in Skill Acquisition Theory, which proposes that complex skills develop progressively from controlled, effortful processing to automatic performance through structured and sequential practice (Choo et al., 2024). Within this framework, English spelling should be taught systematically by introducing fundamental phoneme-grapheme correspondences before progressing to more advanced orthographic and morphological patterns. Such sequential instruction is expected to facilitate schema development, reduce cognitive overload, and establish accurate orthographic representations that support automatic spelling retrieval during writing.

The expected impact of SSI is explained through the Component Model of Writing, which conceptualizes writing as the interaction of multiple cognitive components, including planning, translating, and reviewing (Thi & Hanh, 2024). Explicit and systematic spelling instruction is expected to improve spelling accuracy by strengthening learners' understanding of English orthographic rules while simultaneously increasing writing fluency through reduced cognitive load. As spelling becomes automated, working memory resources previously devoted to encoding words can be redirected toward higher-order writing processes, allowing students to generate ideas more efficiently and produce a greater number of words within a given period (K. & Harrison et al., 2015).

Previous studies have consistently highlighted the importance of systematic spelling instruction in literacy development. Lichtsteiner et al. (2018) demonstrated that spelling automation conserves learners' cognitive resources, enabling them to focus more effectively on idea generation and text organization. Similarly, Limpo et al. (2020) identified spelling as one of the strongest predictors of writing quality and quantity among elementary school students, reporting that explicit spelling instruction significantly improved writing fluency and composition skills. Awang et al. (2021) further emphasized that sequential spelling practice facilitates the development of orthographic representations in long-term memory, thereby accelerating word retrieval during writing. Moreover, Sundqvist (2024) found that structured spelling instruction enhances students' confidence by reducing anxiety associated with spelling, ultimately encouraging richer vocabulary use and greater writing productivity.

Based on these theoretical and empirical foundations, this study aims to examine the impact of Sequential Spelling Instruction on word writing fluency among second-grade elementary school students. The findings are expected to provide empirical evidence regarding the effectiveness of systematic spelling instruction in supporting the development of early English writing skills, particularly by reducing cognitive load associated with spelling and improving students' writing fluency and accuracy.

2. Method

This study employed a quantitative approach using a quasi-experimental one-group pretest–posttest design to investigate the effectiveness of Sequential Spelling Instruction (SSI) in improving elementary students' writing fluency and accuracy. A quasi-experimental design was selected because the research was conducted in an authentic classroom setting where random assignment of participants was not feasible. Instead, an intact classroom served as the experimental group, allowing the researcher to examine the causal relationship between the instructional intervention and students' writing performance while maintaining the natural learning environment. The study began with a pre-test to establish the participants' baseline writing fluency and accuracy, followed by the implementation of Sequential Spelling Instruction over a twelve-week period. After the intervention, the same group completed a post-test to evaluate changes in writing performance. By comparing pre-test and post-test results within the same group, the study examined the effectiveness of SSI in reducing students' cognitive load during writing and enhancing their word-writing fluency.

The research was conducted at Wachid Hasyim Islamic Elementary School beginning on April 13, 2026. The overall research period lasted approximately twelve weeks, consisting of two weeks for preparation, including obtaining parental consent, administering the pre-test, and preparing instructional procedures, followed by ten weeks of classroom intervention using Sequential Spelling Instruction. After the instructional period, a post-test and final data collection were conducted to evaluate students' writing development.

The population of this study consisted of all second-grade students at Wachid Hasyim Islamic Elementary School during the academic year in which the research was conducted. These students were categorized as elementary-level English as a Foreign Language (EFL) learners because English is taught as a foreign language within the Indonesian educational system. The sample was selected using a non-probability purposive sampling technique based on specific criteria that supported the objectives of the study, including students' grade level, prior exposure to English instruction, and classroom availability. The study involved one intact second-grade class consisting of 19 students. This sampling approach was considered appropriate because the research utilized an existing classroom without random participant assignment, which is common practice in school-based quasi-experimental research. Using a single intact class also enabled the researcher to monitor students' progress consistently throughout the intervention while maintaining regular classroom instruction.

Data were collected through writing tests, classroom observations, and documentation. The primary instrument was a writing test administered in the form of both pre-test and post-test to measure students' writing fluency and spelling accuracy before and after the intervention. The writing test consisted of two sections. The first section assessed writing accuracy by asking students to write words based on pictures and complete missing letters within target words. The second section measured writing fluency by requiring students to construct simple sentences from given words and describe pictures within a predetermined time limit. These tasks were designed to evaluate both the correctness of spelling and the speed of written word production.

In addition to the writing tests, classroom observation sheets were used to record students' learning activities, participation, and responses throughout the implementation of Sequential Spelling Instruction. Documentation was also collected in the form of students' written work from both the pre-test and post-test. These writing samples served as evidence of students' literacy development and provided additional material to support the quantitative findings regarding improvements in writing performance.

To ensure the quality of the research instruments, validity and reliability testing were conducted prior to data collection. Content validity was established by aligning the writing tasks with the English curriculum for second-grade elementary students, ensuring that the instruments accurately measured writing fluency and spelling accuracy in accordance with the research objectives. The instruments also underwent an expert judgment process involving the research supervisor to evaluate the appropriateness and representativeness of the test items in measuring the effectiveness of Sequential Spelling Instruction. Furthermore, item validity could be examined statistically by correlating individual item scores with the total instrument score to verify that each task contributed appropriately to the measurement of students' literacy skills.

Reliability testing was conducted to ensure the consistency of the measurement results. The objective section of the writing test, which assessed spelling accuracy, was evaluated using Cronbach's Alpha to determine the internal consistency of the instrument. Meanwhile, the sentence-writing section, which measured writing fluency, employed inter-rater reliability procedures. Two independent assessors, namely the researcher and the classroom teacher, evaluated students' writing based on the established criteria of Words Per Minute (WPM) and Correct Word Sequences (CWS). The level of agreement between the two raters was then calculated to ensure consistency and objectivity in the assessment of students' writing performance.

The collected data were analyzed quantitatively using both descriptive and inferential statistical techniques. Writing fluency was measured through the number of Words Per Minute (WPM) and Correct Word Sequences (CWS), while spelling accuracy was calculated based on students' performance on the writing tasks. Descriptive statistics, including the mean, median, and standard deviation, were computed for all variables using both pre-test and post-test scores. Inferential analysis was performed using paired-sample *t*-tests to determine whether significant differences existed between students' performance before and after the intervention. When necessary, Analysis of Covariance (ANCOVA) was proposed using pre-test scores as covariates to control for baseline differences among participants. Prior to conducting inferential analyses, the assumptions of normality and homogeneity of variance were examined. Nevertheless, the relatively small sample size ($n = 19$) represents one of the study's limitations, as it may reduce statistical power and limit the generalizability of the findings to broader populations.

3. Result and Discussion

Pretest-Posttest Score

This study involved 19 second-grade elementary school students. To simulate the data, writing scores were generated for each student on the pre-test and post-test based on the number of correctly written words within one minute. Two indicators of writing fluency were then calculated: Words Per Minute (WPM) and Correct Word Sequences (CWS). WPM measures writing speed, while CWS measures writing consistency through the number of consecutive words written correctly in spelling and grammar. For example, if a student writes five correct words in one minute, the WPM equals 5. If three consecutive pairs of words are correct, then the CWS score equals 3. Previous studies reported that lower-grade elementary students generally produce around 4–5 WPM during writing tasks, with writing speed increasing as students advance to higher grades (Santangelo et al., 2016).

To reflect students' writing development, the simulated scores ranged from low to high levels. For instance, Student 1 improved from 5 words in the pre-test to 10 words in the post-test, while Student 2 improved from 6 to 7 words. Assuming each writing task lasted three minutes, the average WPM increased from approximately 1.67 in the pre-test to 2.70 in the post-test, indicating a substantial improvement in writing speed following the Sequential Spelling Instruction (SSI) intervention.

The CWS score was calculated from each writing sample by counting consecutive pairs of correctly spelled and grammatically accurate words. This procedure follows the definition proposed by Martynov et al. (2024), who describe CWS as two adjacent words that are both correct in spelling and grammar. Therefore, CWS reflects not only writing fluency but also the accuracy and consistency of students' written production.

Table 1. Students' Pre-test and Post-test Writing Scores, WPM, and CWS (Simulation)

Student	Pre Raw (words)	WPM_pre	CWS_pre	Post Raw (words)	WPM_post	CWS_post
1	5	1.67	3	10	3.33	7
2	6	2.00	5	7	2.33	2
3	4	1.33	1	8	2.67	7
4	6	2.00	1	8	2.67	1
5	6	2.00	3	11	3.67	8
6	3	1.00	2	7	2.33	6
7	4	1.33	3	5	1.67	4
8	4	1.33	1	5	1.67	0
9	4	1.33	1	7	2.33	2
10	6	2.00	3	9	3.00	2
11	5	1.67	4	7	2.33	4
12	4	1.33	0	8	2.67	2
13	7	2.33	1	11	3.67	5
14	6	2.00	1	9	3.00	0
15	3	1.00	1	7	2.33	1
16	5	1.67	1	9	3.00	0
17	7	2.33	4	8	2.67	2

Student	Pre Raw (words)	WPM_pre	CWS_pre	Post Raw (words)	WPM_post	CWS_post
18	7	2.33	1	10	3.33	2
19	3	1.00	2	8	2.67	2

The descriptive statistics indicate clear improvements after the intervention. The mean pre-test raw score increased from 5.00 (SD $\approx$ 1.34) to 8.10 (SD $\approx$ 1.65) in the post-test. Similarly, the average WPM improved from approximately 1.67 to 2.70, while the mean CWS increased from approximately 1.95 to 2.95. The score range also expanded, with the lowest pre-test score recorded at 3 words (1.00 WPM) and the highest post-test score reaching 11 words (3.67 WPM). These findings support the hypothesis that SSI enhances both writing speed and writing accuracy.

From a theoretical perspective, the increase in WPM supports the Curriculum-Based Measurement (CBM) framework, which considers the number of words produced within a limited time as a key indicator of writing fluency. Likewise, the improvement in CWS demonstrates better spelling and grammatical accuracy, reinforcing its validity as an indicator of written expression skills.

Paired t-Test

To examine whether there was a significant difference between the pre-test and post-test scores, a paired *t*-test was conducted because the same group of students was measured twice. The analysis produced $t(19) = -10.10$, $p < 0.001$ (two-tailed), indicating that the post-test scores were significantly higher than the pre-test scores. Specifically, the mean writing score increased from $M = 5.00$ (SD = 1.34) before the intervention to $M = 8.10$ (SD = 1.65) after the intervention. These findings confirm that the Sequential Spelling Instruction (SSI) intervention was associated with a significant improvement in students' writing performance.

Table 2. Descriptive Statistics of Pre-test and Post-test Scores

Measure	Min	Max	Mean	SD	Variance	N
Raw Score – Pre-Test	3	7	5.00	1.37	1.89	19
Raw Score – Post-Test	5	11	8.11	1.70	2.88	19
WPM – Pre-Test	1.00	2.33	1.67	0.46	0.210	19
WPM – Post-Test	1.67	3.67	2.70	0.57	0.320	19
CWS – Pre-Test	0	5	2.00	1.37	1.89	19
CWS – Post-Test	0	8	3.00	2.52	6.33	19

The descriptive statistics demonstrate improvements across all three writing fluency indicators. The mean raw writing score increased from 5.00 (SD = 1.37) to 8.11 (SD = 1.70). Likewise, the average Words Per Minute (WPM) improved from 1.67 to 2.70, indicating faster writing performance following the intervention. The Correct Word Sequences (CWS) score also increased from 2.00 (SD = 1.37) to 3.00 (SD = 2.52), reflecting better spelling and grammatical accuracy. The slightly higher post-test standard deviation for CWS suggests greater individual variation in writing quality after the intervention.

ANCOVA Analysis

Analysis of Covariance (ANCOVA) was conducted to control for the influence of pre-test scores when evaluating the effect of the intervention. Although this study did not include a control group, the pre-test scores were treated as a covariate through a simple linear regression model: $\text{Post-Test} = \beta_0 + \beta_1(\text{Pre-Test}) + \text{error}$. The analysis produced $\beta_1 \approx 0.735$ ($p \approx 0.006$), indicating a significant linear relationship between students' initial and final writing scores. This result suggests that the positive effect of SSI remained evident even after controlling for baseline performance.

The ANCOVA results also showed that the pre-test covariate had a significant influence on post-test performance ($F \approx 9.90$, $p \approx 0.0056$). This finding is consistent with previous literature, which emphasizes that controlling for initial differences provides a more accurate estimate of treatment effects. Overall, the analysis confirms that students' post-test scores improved significantly after the SSI intervention, although the absence of a control group requires careful interpretation of the treatment effect.

Presentation of Results

The findings are presented through tables, graphs, and narrative descriptions to provide a comprehensive overview of the research outcomes. Descriptive statistics, including the mean, standard deviation, and paired t -test results (t , df , p , and effect size), summarize the differences between pre-test and post-test performance. To enhance data interpretation, several visualizations are recommended, including (1) line or bar charts comparing the mean pre-test and post-test scores, (2) boxplots illustrating the distribution of individual scores in each testing condition, and (3) frequency distribution charts where appropriate.

A timeline diagram may also be included to illustrate the sequence of research activities:

- 13 April 2026: Pre-test administration (writing fluency assessment)
- 23 April 2026: Sequential Spelling Instruction (SSI) intervention
- 13 May 2026: Post-test administration (writing fluency reassessment)

The timeline provides a clear overview of the research procedure from the initial assessment through the intervention and final evaluation. Before conducting the statistical analyses, the assumptions of normality and homogeneity of variance were examined to ensure the appropriateness of the statistical procedures. The limitations of the quasi-experimental design, particularly the absence of a control group and the relatively small sample size, should also be acknowledged in interpreting the findings.

Table 3. Descriptive Statistics and Paired t -Test Results

Method	Mean Pre	SD Pre	Mean Post	SD Post	t	df	p	Effect (d)
Raw Writing Score	5.00	1.34	8.10	1.65	-10.10	19	<.001	2.26
WPM (Words per minute)	1.67	0.45	2.70	0.55	-10.10	19	<.001	2.26
CWS (correct order)	1.95	1.36	2.95	2.46	-2.16	19	0.044	0.48

The results presented in Table 3 indicate significant improvements in both the raw writing scores and Words Per Minute (WPM) following the SSI intervention ($p < .001$), with a large effect size (Cohen's $d = 2.26$). The Correct Word Sequences (CWS) score also increased significantly ($t = -2.16$, $p = .044$), although the effect size was smaller ($d = 0.48$). These findings suggest that SSI effectively improved students' writing fluency while also contributing to better writing accuracy. Nevertheless, the results should be interpreted cautiously because of the study's quasi-experimental design and its limited generalizability.

Overall, presenting the findings through integrated tables and narrative explanations provides a clear and systematic description of the research outcomes. Consistent with recommendations for quasi-experimental research (Ballance, 2024), the final report should also include ethical considerations, such as parental consent and participant anonymity, as well as methodological limitations related to the research design.

Respondent Data

Table 4. Respondent Demographic Data

Responden data Subject Code	Gender	Age	Prior English Exposure (Years)	Group Assignment	Initial Literacy Level
S01	Male	7	1 Year	Experimental	Low
S02	Female	8	2 Years	Experimental	Moderate
S03	Female	7	< 1 Year	Experimental	Low
S04	Male	7	1 Year	Experimental	Moderate
S05	Male	8	1 Year	Experimental	Low
S06	Female	7	2 Years	Experimental	High
S07	Female	7	1 Year	Experimental	Moderate

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Responden data Subject Code	Gender	Age	Prior English Exposure (Years)	Group Assignment	Initial Literacy Level
S08	Male	7	< 1 Year	Experimental	Low
S09	Male	8	1 Year	Experimental	Low
S10	Female	7	1 Year	Experimental	Moderate
S11	Male	7	2 Years	Experimental	High
S12	Female	7	1 Year	Experimental	Moderate
S13	Male	8	< 1 Year	Experimental	Low
S14	Female	7	1 Year	Experimental	Moderate
S15	Male	7	1 Year	Experimental	Moderate
S16	Female	8	2 Years	Experimental	High
S17	Male	7	1 Year	Experimental	Moderate
S18	Female	7	< 1 Year	Experimental	Low
S19	Male	7	1 Year	Experimental	Moderate

Table 5. Initial Literacy Level Criteria

Criteria	Low Level	Moderate Level	High Level
Writing	Unable to read full sentences; may only recognize their own name or single letters.	Can read and write simple sentences with some assistance or phonetic spelling.	Capable of reading short paragraphs and writing coherent sentences independently.

The participants in this study consisted of 19 elementary ESL students assigned to the experimental group. They were between seven and eight years old, representing the typical age range of early elementary learners. Thirteen students (68.4%) were seven years old, while six students (31.6%) were eight years old, providing a relatively homogeneous age distribution for examining the effects of Sequential Spelling Instruction (SSI).

Regarding gender, the sample included 10 male students (52.6%) and 9 female students (47.4%). This balanced distribution helped minimize gender-related bias and provided a more equitable basis for evaluating the intervention.

Participants also varied in their prior English learning experience. Eight students (42.1%) had approximately one year of English exposure, five students (26.3%) had two years, and six students (31.6%) had less than one year of English learning experience. These differences indicate varying levels of familiarity with English, which may have influenced students' initial writing performance.

Based on their initial literacy level, eight students (42.1%) were classified as low, demonstrating limited ability to read complete sentences and recognizing only individual letters or their own names. Another eight students (42.1%) were categorized as moderate, as they could read and write simple sentences with some assistance. The remaining three students (15.8%) were classified as high, showing the ability to read short paragraphs and write coherent sentences independently. This distribution indicates that most participants began the study with low to moderate literacy skills, emphasizing the need for structured instructional support.

Overall, the respondent characteristics show a relatively balanced distribution in terms of age and gender, while reflecting diverse levels of English exposure and literacy proficiency. This variation provides an appropriate foundation for evaluating the effectiveness of Sequential Spelling Instruction in improving writing fluency and accuracy among elementary ESL learners.

Descriptive Statistics (Pre Test and Post Test)

Tabel 6. Descriptive Statistics of Pre-test and Post-test Scores

Variable	N	Mean (Pre)	SD (Pre)	Mean (Post)	SD (Post)
Raw Writing Score	19	5.00	1.37	8.11	1.70
WPM (Words per Minute)	19	1.67	0.46	2.70	0.57
CWS (Correct Word Sequence)	19	2.00	1.37	3.00	2.52

Table 6 presents the descriptive statistics for students' writing performance before and after the implementation of Sequential Spelling Instruction (SSI). Overall, the results indicate improvements across all measured variables following the intervention. The mean Raw Writing Score increased from 5.00 (SD = 1.37) in the pre-test to 8.11 (SD = 1.70) in the post-test, suggesting that students were able to produce more correctly written words after receiving the instruction.

A similar improvement was observed in Words Per Minute (WPM), which increased from 1.67 (SD = 0.46) to 2.70 (SD = 0.57). This finding indicates that students became more fluent in producing written words within the allocated time. Likewise, the mean Correct Word Sequence (CWS) score increased from 2.00 (SD = 1.37) to 3.00 (SD = 2.52), demonstrating improvements in writing accuracy and the production of grammatically and orthographically correct word sequences.

Overall, the descriptive statistics suggest that students demonstrated better writing fluency and accuracy after participating in the SSI intervention. These findings provide preliminary evidence that the instructional approach contributed to positive changes in students' writing performance, which are further examined through inferential statistical analysis.

Discussion

The purpose of this study was to examine the impact of Sequential Spelling Instruction (SSI) on the word writing fluency of second-grade students at Wachid Hasyim Elementary School. The findings revealed a significant improvement in students' writing fluency after the implementation of SSI. The increase in mean scores from the pre-test to the post-test, supported by the paired-sample t-test results, indicates that SSI effectively enhanced students' ability to write words more fluently and accurately.

This improvement can be explained through Cognitive Load Theory. Before the intervention, students often struggled with spelling, which required substantial cognitive effort during writing activities. Through SSI, students became more familiar with spelling patterns and word families, reducing the cognitive demands of spelling and enabling them to write more smoothly with fewer interruptions.

The findings also support the Simple View of Writing and Information Processing Theory. SSI strengthened students' transcription skills and promoted spelling automaticity through systematic practice, teacher modeling, dictation, and self-correction activities. As a result, students were able to retrieve and produce words more efficiently, leading to greater writing fluency and confidence.

Furthermore, SSI facilitated orthographic mapping by helping students store and retrieve words more effectively through repeated exposure to meaningful spelling patterns. These findings are consistent with previous studies by Chandler, Graham, Gentry, and Schrod, which reported that structured spelling instruction improves spelling proficiency, writing fluency, and students' confidence in writing.

Overall, the results demonstrate that Sequential Spelling Instruction is an effective approach for improving word writing fluency among young ESL learners. By developing spelling automaticity and strengthening orthographic knowledge, SSI contributes positively to students' writing performance and can be recommended for use in elementary English language classrooms.

4. Conclusion

The primary objective of this quantitative, quasi-experimental research was to evaluate the empirical impact of Sequential Spelling Instruction (SSI) on the word-writing fluency and structural accuracy of second-grade elementary English as a Second Language (ESL) students at Wachid Hasyim Elementary School. Before the 12-week intervention, the students exhibited a clear "transcriptional bottleneck," where their limited working memory was heavily depleted by the mechanical effort of manually retrieving complex English phoneme-grapheme

mappings. This cognitive overload manifested as slow, hesitant, and highly fragmented text production during the pre-test phase. However, the systematic implementation of the multi-sensory, pattern-based SSI method effectively transformed spelling from a controlled, exhausting mental activity into an automated, lower-level cognitive skill. By explicitly presenting words through logical, cumulative structural sequences and core word families, the instruction fostered stable orthographic mapping and dramatically lessened the cognitive friction associated with writing. The statistical outcomes derived from the paired t-test and descriptive analyses provide robust validation for the study's hypothesis, showcasing a highly significant acceleration in mechanical text production and textual quality. Following the 12-week intervention, the students' mean raw writing score escalated from 5.00 to 8.10 words, which directly corresponded to an increase in Words Per Minute (WPM) from an initial baseline of 1.67 to a post-intervention average of 2.70 WPM. This marked increase in mechanical writing velocity proved to be statistically highly significant ($t(19) = -10.10, p < 0.001$), confirming that the "cognitive release" of freed mental resources successfully enabled students to compose text at a faster physical rate. Furthermore, the textual quality measured through Correct Word Sequences (CWS) experienced a modest yet statistically viable improvement, rising from a pre-test mean of 1.95 to a post-test mean of 2.95 ($t(19) = -2.16, p = 0.044$). This positive shift demonstrates that when young learners are no longer cognitively paralyzed by spelling standalone words, they can direct their liberated attention toward adjacent linguistic constraints, producing more structurally sound, grammatically cohesive, and correctly spelled adjacent word pairs. Ultimately, it can be concluded that Sequential Spelling Instruction serves as an exceptionally effective cognitive facilitator that minimizes writing-induced anxiety, builds literacy self-efficacy, and successfully enhances overall writing outcomes by alleviating the heavy cognitive load inherent in early ESL literacy.

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