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The Effects of Interactive Writing Strategy on Lexical Complexity in EFL Students' Written Performance

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Abstract: The aim of this study is to explore the impact of using interactive writing strategy on EFL students' written outputs. This investigation involved 100 EFL students, comprising an experimental group (N = 50), which practiced writing skills through interactive writing sessions, and a control group (N = 50), which received traditional writing instruction. The research methodology included the administration of a pretest/post-test, and the analysis of essays was conducted using the L2 Lexical Complexity Analyzer to calculate lexical complexity scores. The study's findings revealed a significant progress in EFL learners' overall writing performance after using interactive writing strategies (p =.000).The results also revealed statistically significant differences in lexical density and lexical sophistication scores for the experimental group, indicating that students wrote denser and more sophisticated essays after participating in the interactive writing sessions. However, no differences were detected for lexical variation. The findings of this study highlighted the importance of using interactive writing in EFL writing classrooms, with implications for teachers.

Keywords: Interactive Writing, lexical complexity, Writing Performance, EFL Students.

1. Introduction

Over the course of second language acquisition (SLA), several teaching approaches have appeared. The Communicative Approach, which was introduced in Second Language Acquisition, has highlighted the importance of interaction in the learning process and the interactive nature of language. According to Swain (1985), learning is more productive when the target language is practised dynamically and interactively. Moreover, interaction in EFL classes fosters the development of communicative skills and enhances students' abilities to express themselves accurately and fluently. Additionally, interaction promotes a dynamic learning classroom where students actively participate in language learning and receive immediate feedback on their performance. Furthermore, according to Carson (1994), vocabulary learning occurs when learners engage in conversations with others that demonstrate the target words' uses. Effective conversation and discussion are essential for learners to understand and apply word rules in various contexts (Kowal & Swain, 1994). The context in which learners interact significantly influences the effectiveness of language learning. Meaningful contexts are essential for promoting functional language use, along with offering opportunities for practice and application to reinforce learning (Dutro & Moran, 2003).

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1.1. Interactive Writing

The concept of instructional interaction, which is often used to explain activities that occur between the learner and his environment, highlights the significance of providing the learner with a degree of autonomy over the learning process. Interactive writing is a teaching strategy based on the social constructivist theory by Vygotsky (1978) and Clay's Emergent Literacy Approach Clay (1975), which enables teachers and students to "share the pen" to construct texts during writing lessons. Interactive writing, as described by Roth and Dabrowski (2016), involves the teacher acting as an expert writer for students, fostering collaboration to create meaningful texts (pp. 44–45). Encouraging students to actively participate in creating written materials enhances their grasp of grammar, spelling, and sentence structure. Moreover, interactive writing fosters collaborative learning as students work together to brainstorm ideas and improve their writing skills.

According to McCarrier, Pinell, and Fountas (2000), interactive writing is a teaching strategy in which both the teacher and students collaborate to compose texts, and where they frequently "thinks aloud" to demonstrate the writing process. Furthermore, the teacher and the students "share the pen" (McCarrier, Pinell, and Fountas, 2000; p. xv, cited in Correia, 2007, p. 5). Actively engaging in the writing process by sharing the pen leads to an interactive learning environment. During interactive writing sessions, students actively participate in the writing process by sharing the pen with the teacher. Moreover, during interactive writing lessons, the role of the teacher shifts as he scaffolds and explains the students' emerging writing skills (Correia, 2007, p. 6). In addition, his role is crucial in guiding pupils during interactive writing lessons, ensuring their understanding and engagement. Throughout these sessions, the teacher actively guides students in brainstorming, drafting, and revising their writing assignments. Students are empowered to engage actively in the writing process as the teacher provides tailored levels of support to meet their individual needs. Rubadue (2002) highlights the collaborative nature of writing sessions where both the teacher and students contribute to the composition of texts. Tailoring guidance to match every student's level of text engagement is a key aspect of effective teaching practices (Hall et al., 2013, p. 1).

1.2. Lexical Complexity

A plethora of studies have called for new methods of measuring and assessing student written performance. According to Larsen-Freeman (2009, p. 1), there have been numerous proposals to assess language development other than standardized tests. Researchers such as Ai & Lu (2010), AlQahtani (2015), Bulté & Housen (2014), Lu (2012), Nation (2011), and Zhou & Dai (2016) have focused on the development of learners' lexical knowledge. Current studies are shifting their focus from estimating vocabulary size to measuring lexical complexity through frameworks that analyse traits like the richness of vocabulary and dimensions such as lexical density, lexical sophistication and lexical variation.

Lexical density, which measures the proportion of lexical words in a text, is calculated by dividing the number of content words by the sum of content words and function words (Ure, 1971). According to Halliday (1989), lexical density refers to how densely information or ideas are presented through content words, as opposed to grammatical items. Put simply, lexical density measures the proportion of content words in a text, indicating the complexity and depth of information communicated through the language. A higher lexical density indicates that there is more information in the discourse, which increases the cognitive load required for information processing. Plevoets and Defrancq (2018) found lexical density in interpreted texts to be a strong factor in the occurrence of the disfluency

marker "uh(m),which suggests that interpreters experience cognitive load during interpretation. (Cited in Liu and Dou, 2023, p. 4).

Several studies have shown the importance of analysing of lexical density in EFL students' written performance. When writing skills are the focus of linguistic analysis, lexical density is viewed as an instrument for characterizing the text. According to Li and Zhang (2021), a text has a higher lexical density when it contains more distinctive words and a broader vocabulary. This indicates that texts with a higher lexical density contain a greater variety of distinctive words and a broader vocabulary. Furthermore, Gregori-Signes and Clavel-Arroitia (2015) conducted a comparative analysis of lexical density across written performance from different groups of students at various levels. The study found that students could consistently demonstrate a similar level of lexical richness in their writing, indicating a stable development of vocabulary over time. These findings highlight that reliable qualitative and quantitative assessments of lexical richness knowledge play a crucial role in giving instructors a thorough understanding of students' lexical progress.

Furthermore, lexical sophistication is another key component of assessing writing development and proficiency. It is the proportion of advanced words (Read, 2000). Kyle and Crossley (2014) argue that the concept of sophistication encompasses both the depth and breadth of lexical knowledge. In other words, lexical sophistication encompasses not only the use of uncommon words, but also using them correctly in the context. This displays a student's mastery of the language and improves the overall quality of writing. Several lexical metrics have shed light on the concept of lexical sophistication and its relationship to second language (L2) acquisition and writing. These indices offer a deep understanding of lexical sophistication than simply the number of words used. They emphasize the breadth and depth of vocabulary knowledge required for proficient writing in a second language.

According to several studies on lexical sophistication, proficient writers use fewer frequent words when responding to independent tasks. Laufer and Nation (1995) observed that proficient L2 students used less words with higher frequencies, such as the top 1000 words in English. Other studies have revealed identical findings regarding the corpus frequency of words in independent L2 compositions, indicating that more competent L2 students use fewer words than less competent ones (Crossley & McNamara, 2012; Crossley et al., 2013; Guo et al., 2013).

The third lexical complexity metric is lexical diversity. It refers to the extent to which texts reuse words, typically assessed by counting words and adjusted to account for text features. It refers to the various terms and phrases employed to refer to the same items or concepts. Studies on lexical diversity use different measures as illustrative metrics for Lexical Diversity assessment such as the the measure of textual lexical diversity (MTLD). MTLD is defined as "the average length of sequential word strings in a text that maintains a given [type-token ratio] value" (McCarthy & Jarvis, 2010, p. 384). Because Lexical Diversity can be investigated from different perspectives, researchers should use several benchmarks, such as MTLD, rather than a single yardstick (McCarthy and Jarvis, 2010). The type-token ratio (TTR), one of the most effective measures of lexical variation in discourse (Wolfe-Quintero, Inagaki, & Kim, 1998), is frequently used to assess each student's overall language proficiency. TTR is calculated by dividing the number of unique words in a text by its total number of words. A high TTR indicates that learners use a diverse range of linguistic forms, resulting in a significant change in the individual's writing style or register. This is particularly useful in second language acquisition research because it reveals information about the learner's language development and proficiency level. TTR can also be used to compare various learners or groups of learners in order to identify patterns or trends in their language use. González (2017) also

investigated how lexical diversity affected tertiary level writing with 104 multilingual English learners and 68 monolingual English-speaking students, using data from their essays. The results indicated that lexical diversity significantly lowered the essay scores of the students. Moreover, the analysis suggested that the incorporation of mid-frequency vocabulary had a more pronounced effect on enhancing writing proficiency levels compared to less-frequency vocabulary. Vidal and Jarvis (2020) investigated the effects of English-medium instruction on third-year Spanish university students' writing LD scores, including MTLD: the students significantly improved their target language proficiency and essay quality, but did not show improvement in their LD scores in writing. Thus, definitive conclusions regarding the effectiveness of second language writing approaches for learners with LD types remain elusive.

The above-mentioned studies demonstrate that lexical complexity significantly enhances EFL writing performance. The current study aims to gather additional evidence by tracking students' performance development after implementing the interactive writing approach and measuring changes in their lexical complexity. The purpose of this research is to contribute to the existing literature by exploring the changes in lexical complexity resulting from interactive writing activities and their implications for enhancing EFL writing skills.

The motivation and significance of this research stem from a variety of previous studies. According to Elgobshawi and Aldawsari (2022), writing skill instruction emphasizes reinforcing grammatical complexity in the learning process when an individual is learning new language structures or advanced text patterns. As a result, learners are more likely to focus on determining whether a given structure is well-formed or not for accuracy rather than emphasizing creativity. Writing is expected to depict the frequency of lexical words, which are crucial for language proficiency, rather than focusing on structure or function words. They also argue that there is a dearth of research on how learners' writing skills are affected by lexical complexity and how much this can signal improvements in writing proficiency (Elgobshawi and Aldawsari, 2022; p.182). However, scarce research have scrutinized the impact of interactive writing instruction on the improvement of lexical complexity in students' written output. Assuming that lexical complexity can detect students' progress, this research measures the lexical complexity metrics of the EFL students' written performance after receiving the interactive writing treatment.

2. Research Question

This research assesses lexical complexity in the written composition of Tunisian EFL undergraduates after participating in interactive writing sessions. It explores the association between lexical complexity and interactive writing strategy in terms of the scores attained by the participants. The research aims to achieve the following objective:

- To detect the effect of interactive writing on the lexical complexity in students' writing

Arising from this research gap, the research question is as follows:

- To what extent does implementing interactive writing lead to significant gains in the measures of lexical complexity in the written performance of EFL undergraduate students?

3. Methodology

3.1. Research Design

In this study, a before-and-after study research design was used in response to the above-mentioned research question. This design compares a group or an individual before and after an intervention or treatment. The primary goal is to evaluate the intervention's impact or effect by tracking changes over time. Kumar (2011) states that this design "is the most appropriate design for measuring the impact or effectiveness of a programme. A before-and-after design can be described as two sets of cross-sectional data collection points on the same population to find out the change in the phenomenon or variable(s) between two points in time" (p.107)

The goal of this research was to explore the impact of interactive writing strategy on students' written performance through measuring lexical complexity metrics. The aim of this study was to inspect whether interactive writing, which includes collaborative writing activities and real-time feedback, would result in better-written performance and help students write denser essays, with more complex and sophisticated words, than traditional instruction.

3.2. Participants

This study's sample size consisted of 100 Tunisian EFL undergraduate students from the management department at the Higher Institute of Business Administration in Sfax, Tunisia, chosen using a non-probability convenience sampling technique. Participants were divided into two groups: experimental (50 students) and control (50 students). The two groups were selected at random from the institute's seven existing classes. The experimental group participated in interactive writing lessons, whereas the control group received traditional instruction. As part of the interactive writing lessons, the instructor gave real-time feedback, held group discussions, and assigned practical exercises.

3.3. Instruments of Data Collection

3.3.1. Essay Writing Tests

Essay writing tests are a valuable data collection tool in a variety of educational, and research settings. These tests provide a one-of-a-kind way to assess students' knowledge and skills. Essay writing tests, when carefully designed and administered, can yield rich and nuanced data that goes beyond the scope of multiple-choice or short-answer assessments. This research employs a pre-post test in the form of essays to evaluate students' writing performance. At the beginning of the scholastic year 2022-2023, the teacher assigned a writing task for her students as the pre-test writing essay. After four months, the researcher assigned another writing task for the participants as the post-test essay.

3.3.2. The lexical Complexity Analyzer

After collecting the data, lexical complexity measures were evaluated using an automation process called the Lexical Complexity Analyzer (LCA), which is part of the L2 Syntactic Complexity analyzer (L2SCA). It is a comprehensive instrument that considers a variety of lexical complexity factors in English text, providing a thorough analysis of language use that includes variables like lexical density. The L2LCA also provides detailed feedback on specific areas of improvement for language learners, making it an invaluable resource for language instructors. Its user-friendly

interface and customizable features make it both accessible and useful for second language acquisition researchers. The researcher opted to use this software for its accessibility and the quality of the findings it generates for the analysis. As per Lu (2010), the tool demonstrates a high level of reliability in identifying units and structures, with F-scores ranging from 0.846 to 1.000 for different types of data. The multidimensional approach of this software is instrumental in assisting researchers to gain a deeper understanding and enhance lexical complexity in second language acquisition.

4. Results

To determine whether there were significant differences between the two groups before and after the intervention, this research performed paired sample t-tests on the data obtained using SPSS with an alpha level of 0.05 as the significance threshold. A series of paired sample t-tests comparing pre- and post-tests were used to determine whether students' lexical complexity improved significantly after the intervention phase. This method enabled a direct comparison of students' performance, providing useful insights into the effectiveness of the interactive writing strategy. The results of the descriptive statistics and paired sample t-tests are summarised in Table 1.

Table 1: Paired samples t-test, investigating the differences between the pre- and post-tests of the interactive writing strategy on the lexical complexity measures

		Pre-test		**Post-test**			
		Mean	**SD**	**Mean**	**SD**	**T**	**P**
Lexical Density	Control group	46,79	5,36	52,82	6,69	-5,858	,000
	Experimental group	45,68	4,62	53,96	4,00	-9,021	,000
Lexical Sophistication	Control group	,8544	0,27	,8538	0,26	,103	,918
	Experimental group	,8484	0,25	,8650	0,29	-3,085	,003
Lexical Variation	Control group	,0416	0,11	,0470	,009	-2,641	,011
	Experimental group	,0406	0,14	,0366	0,12	1,661	,103

Regarding lexical density, a significant difference was found in the control group between the pre-test and post-test scores, t (49) = -5.858, p < .001, which indicates a statistically significant progress in lexical density for the control. The paired sample t-test results also showed that there was a significant difference between the pre-test and post-test scores in lexical density for the experimental group, t (49) = -9.021, and the p-value is 0.000, suggesting a highly significant increase in lexical density for the experimental group as well.

Regarding lexical sophistication, the results of the control group indicated no statistically significant difference after implementing the interactive writing strategy, indicating no noticeable change with t (49) = 0, 0103, p =.918. However, the results of the experimental group revealed a statistically significant increase in sophistication, with a positive change with t (49) = -3,085, p

=.003. While lexical sophistication did not change significantly for the control group, the experimental group indicated a significant progress.

The analysis of lexical variation produced contradictory results. The paired sample T-test for the control group revealed a statistically significant increase in lexical variation (t-value -2.641, p-value 0.011). However, the results of the experimental group indicated that the t-value is 1.661 and the p-value is 0.103, showing no statistically significant change in lexical variation for the experimental group.

The normality of the variable distribution was evaluated using Shapiro-Wilk tests both before and after the test. The findings revealed mixed results because some variables were normally distributed whereas others were not. Moreover, to explore the effects of interactive writing strategy on the lexical complexity, a set of Wilcoxon signed rank tests was carried out. Table 2 shows the results for the lexical density measure.

Table 2: Wilcoxon signed rank test, investigating the differences between the pre- and post-tests of the interactive writing regarding the EFL students' lexical density**.**

	Pretest		**Posttest**		**Wilcoxon signed rank test**	
	Mean	**SD**	**Mean**	**SD**	**Z**	**P**
Lexical Density	46,2376	5,01	53,3971	5,51	-7,496	,000

As Table 2 indicates, the Z-value of -7.496 indicates the direction and magnitude of change. The p-value of.000 indicates that the change in lexical density from pre-test to post-test is statistically significant. The results of Wilcoxon signed rank tests were all significant, indicating that the interactive writing strategy had a positive impact on the participants' lexical density. These results emphasise the findings of the paired sample t-test. Table 3 presents the descriptive statistics and the Wilcoxon signed rank tests for the lexical sophistication measure.

Table 3: Wilcoxon signed rank test, investigating the differences between the pre- and post-tests of the interactive writing regarding the EFL students' lexical sophistication

	Pre test		**Post test**		**Wilcoxon signed rank test**	
	Mean	**SD**	**Mean**	**SD**	**Z**	**P**
Lexical sophistication	,8505	0,26	,8594	,028	-2,158	,031

As shown in Table 3, There was a statistically significant improvement in lexical sophistication (p-value = 0.031). Although the change in mean values is small (0.8505 to 0.8594), it is significant. This indicates that the interactive writing intervention had a positive effect on the participants' vocabulary use.

Table 4: Wilcoxon signed rank test, investigating the differences between the pre- and post-tests of the interactive writing regarding the EFL students' lexical variation.

	Pre test		Post test		Wilcoxon signed rank test	
	Mean	**SD**	**Mean**	**SD**	**Z**	**P**
Lexical variation	0,411	0,13	0,418	,012	-,416	,678

However, the findings from Wilcoxon signed rank tests in Table 4 indicated not significant change for the lexical variation measure. Therefore, it can be summarised that the interactive writing intervention do not influence the lexical variation of the students. One possible reason for the lack of improvement in lexical variation could be the varying levels of prior exposure to a diverse range of vocabulary among students. The duration and intensity of the program may also have had an impact on the intervention's effectiveness. The study was brief, and students had limited exposure to the interactive writing method, which may have limited the potential for significant improvement in lexical variation

5. Discussion

The current study traced the effect of implementing interactive writing on the lexical complexity measures in the EFL undergraduate students' written performance. The results indicated a statistically significant difference in the results obtained before and after the intervention for lexical density and lexical sophistication. However, the results showed no statistically significant difference for lexical variation.

The results are consistent with Elgobshawi and Aldawsari (2020) study. According to them, students' written performance improved by using more densely composed words as they progressed through their studies. They stated that " the findings from the current study show some evidence of improvement in lexical density in the written performance of respondents as they moved up to a higher study level" (Elgobshawi and Aldawsari ,2020; p.189). González (2017) suggests that lexical density may also play an important role in writing proficiency, which lends credence to this finding. Nevertheless, the findings do not support previous research. Kim (2014) discovered no significant correlation between students' lexical density and L2 proficiency levels. This discrepancy may be attributed to variations in the methodologies, such as data collection techniques or sample sizes, employed in the studies. The findings of this study are in line with those of Moqadasizadeh et al. (2023). According to their findings, the group of students that used interactive writing strategies outperformed the independent and collaborative writing groups in syntactic complexity. The researchers concluded that the use of interactive writing strategies led to more precise and complex writing performance based on their study results (Moqadasizadeh et al., 2023, p.109).Similarly, Jafari and Ansari (2012) discovered that learners who participated in interactive writing produced more accurate texts than those in the independent writing group.

However, the results contradicts the results of Dobao (2012). Dobao (2012) found no statistically significant differences in syntactic or lexical complexity between the writing samples produced interactively and independently. The study by Dobao (2012) produced conflicting results attributed to variations in group size and the learners' second language (Spanish). Additionally, Watanabe (2014) identified conflicting results, suggesting that learners generated a significantly higher number

of words when writing independently compared to writing interactively. These conflicting results indicate that the impact of interactive versus independent writing on syntactic and lexical complexity may vary based on factors such as group size and language background.

The findings from Wigglesworth and Storch (2012), Adams and Ross-Feldman (2008), and Lee (2016) all support the idea that interactive writing tasks enhance lexical sophistication. Wigglesworth and Storch (2012) examined the impact of collaborative writing tasks on lexical sophistication. The results indicate that when students collaborate, they create texts with higher lexical sophistication due to the sharing of knowledge and negotiation of meaning. Adams and Ross-Feldman (2008) proposed that the provision of scaffolding and peer support motivates learners to incorporate a wider range of vocabulary and complexity in their language use.

In his study, Lee (2016) delved into the mechanism through which collaborative writing enhances lexical sophistication by motivating learners to employ more advanced vocabulary. The research outcomes highlighted that the negotiation of meaning during collaborative tasks significantly contributes to the improvement of lexical development.

Even though the results from the lexical density and lexical sophistication provided support for the benefits of interactive writing, the results of lexical variation reported contrary findings. The results for lexical variation are inconsistent with Kim (2008). This study emphasizes the importance of peer-to-peer interactive writing in lexical acquisition, demonstrating how this specific form of interaction improves vocabulary learning and usage. According to the study, learners' lexical variation increases as they negotiate meaning, such as through collaborative writing tasks or group discussions. This emphasizes the significance of engaging students in interactive tasks, such as vocabulary games or role-playing exercises, to promote lexical proficiency.

6. Conclusion

This research explored the effect of implementing the interactive writing strategy of the lexical complexity measures on EFL undergraduates' written performance. The study found that interactive writing sessions improved the written performance of Tunisian EFL undergraduate students in terms of lexical density and sophistication. The results showed that lexical density and lexical sophistication improved in the posttests for both groups. Students who received the interactive writing strategy intervention showed a greater improvement in lexical density and sophistication measures than the control group. In conclusion, the study suggests that integrating interactive writing activities can enhance the written performance of EFL students.

This research offers evidence for potential progress of the written performance of Tunisian EFL students after receiving interactive writing sessions. These findings, however, cannot be generalized. First, despite being well-controlled and identified, the study sample is insufficiently large. Small sample sizes reduce the study's statistical power, making it more challenging to detect subtle effects. Given the limited sample size, the findings may not be generalizable to a larger population of Tunisian EFL students. This could be a foundational starting point for more extensive research. Future studies should prioritize expanding the sample size to improve the generalizability of the results. Second, the intervention short duration presents another study limitation. Writing skills, such as fluency, complexity, and lexical variation, usually take time to develop. A brief intervention period may not have allowed students to fully benefit from the interactive writing sessions, particularly in terms of syntactic improvement. Conducting long-term follow-up studies would be instrumental in determining improvements in writing performance. Incorporating other measures of writing performance, such as syntactic complexity, could also provide a more comprehensive assessment of writing development.

The results of this research have pedagogical implications for the implementation of interactive writing strategies in the EFL classroom, implying that learners can address their linguistic challenges more effectively with help and guidance than when working independently. For example, collaborative writing activities not only enhance students' writing skills but also foster effective communication and collaboration in a foreign language. Teachers can incorporate collaborative writing tasks such as pair and group work or role-based collaboration. Moreover, integrating peer feedback, such as structured peer reviews and teacher guidance throughout the writing process, is instrumental in enhancing students' language proficiency. Teachers should think about incorporating interactive writing sessions into their curriculum to assist students in improving their writing skills. Finally, digital tools such as Google Docs and Padlet can help with real-time collaborative writing. These platforms enable seamless collaboration and instant feedback.

References

[1] Adams, R., & Ross-Feldman, L. (2008). Does writing influence learner attention to form? In R. Ellis, S. Loewen, & C. Elder (Eds.), Implicit and explicit knowledge in second language learning, testing and teaching (pp. 283–302). Multilingual Matters.

[2] Ai, H., & Lu, X. (2010). A Web-based System for Automatic Measurement of Lexical Complexity. In 27th Annual Symposium of the Computer Assisted Language Consortium (CALICO-10). (pp. 8–12). Amherst.

[3] Alqahtani, M. (2015). The importance of vocabulary in language learning and how to be taught. International Journal of Teaching and Education, III(3), 21–34. https://doi.org/10.20472/te.2015.3.3.002

[4] Bulté, B., & Housen, A. (2014). Conceptualizing and measuring short-term changes in L2 writing complexity. Journal of Second Language Writing, 26, 42–65. https://doi.org/10.1016/j.jslw.2014.09.005

[5] Carson, J. G. (1998). Cultural backgrounds: What do we need to know about the background of L2 writers? Journal of Second Language Writing, 3(1), 67–81.

[6] Clay, M. M. (1975). What did I write? Heinemann.

[7] Crossley, S. A., & McNamara, D. S. (2012). Predicting Second language writing proficiency: The roles of cohesion and linguistic sophistication. Journal of Research in Reading, 35(2), 115–135. https://doi.org/10.1111/j.1467-9817.2010.01449.x

[8] Crossley, S. A., Cobb, T., & McNamara, D. S. (2013). Comparing count-based and band-based indices of word frequency: Implications for active vocabulary research and pedagogical applications. System, 41(4), 965–981. https://doi.org/10.1016/j.system.2013.08.002

[9] Dobao, A. (2012). Collaborative writing tasks in the L2 classroom: Comparing group, pair, and individual work. Journal of Second Language Writing, 21(1), 40–58. https://doi.org/10.1016/j.jslw.2011.12.002

[10] Dutro, S., & Moran, C. (2003). Rethinking english language instruction: An architectural approach. English Learners: Reaching the Highest Level of English Literacy, 227–258. https://doi.org/10.1598/0872074552.10

[11] Elgobshawi, A. E., & Aldawsari, M. (2022). Lexical density as improvement indicator in the written performance of EFL majors. International Journal of English Language and Literature Studies, 11(4), 181–190. https://doi.org/10.55493/5019.v11i4.4668

[12] González, M. C. (2017). The contribution of lexical diversity to college-level writing. TESOL Journal, 8(4), 899–919. https://doi.org/10.1002/tesj.342

[13] Gregori-Signes, C., & Clavel-Arroitia, B. (2015). Analysing lexical density and lexical diversity in university students' written discourse. Procedia - Social and Behavioral Sciences, 198, 546–556. https://doi.org/10.1016/j.sbspro.2015.07.477

[14] Guo, L., Crossley, S. A., & McNamara, D. S. (2013). Predicting human judgments of essay quality in both integrated and independent Second language writing samples: A comparison study. Assessing Writing, 18(3), 218–238. https://doi.org/10.1016/j.asw.2013.05.002

[15] Hall, A. H., Toland, M. D., Grisham-Brown, J., & Graham, S. (2013). Exploring interactive writing as an effective practice for increasing head start students' alphabet knowledge skills. Early Childhood Education Journal, 42(6), 423–430. https://doi.org/10.1007/s10643-013-0594-5

[16] Halliday, M. A. K. (1989). Spoken and written language (2nd ed.). Oxford University Press.

[17] Jafari, N., & Ansari, D. N. (2012). The effect of collaboration on Iranian EFL Learners' writing accuracy. International Education Studies, 5(2). https://doi.org/10.5539/ies.v5n2p125

[18] Kim, Y. J. (2014). Predicting L2 writing proficiency using linguistic complexity measures: A corpus-based study. English Teaching, 69(4), 27–51. https://doi.org/10.15858/engtea.69.4.201412.27

[19] Kim, Y. (2008). The contribution of collaborative and individual tasks to the acquisition of L2 vocabulary. The Modern Language Journal, 92(1), 114–130. https://doi.org/10.1111/j.1540-4781.2008.00690.x

[20] Kowal, M., & Swain, M. (1994). Using collaborative language production tasks to promote students' language awareness. Language Awareness, 3(2), 73–93. https://doi.org/10.1080/09658416.1994.9959845

[21] Kumar, R. (2011). Research methodology: A step-by-step guide for beginners. Sage.

[22] Kyle, K., & Crossley, S. A. (2014). Automatically assessing lexical sophistication: Indices, tools, findings, and application. TESOL Quarterly, 49(4), 757–786. https://doi.org/10.1002/tesq.194

[23] Larsen-Freeman, D. (2009). Adjusting expectations: The study of complexity, accuracy, and fluency in second language acquisition. Applied Linguistics, 30(4), 579–589. https://doi.org/10.1093/applin/amp043

[24] Laufer, B., & Nation, P. (1995). Vocabulary Size and Use: Lexical Richness in L2 Written Production. https://doi.org/10.26686/wgtn.12560396.v1

[25] Lee, M.-K. (2016). Peer feedback in Second language writing: Investigating junior secondary students' perspectives on inter-feedback and intra-feedback. System, 55, 1–10. https://doi.org/10.1016/j.system.2015.08.003

[26] Li, X., & Zhang, H. (2021). Developmental features of lexical richness in English writings by Chinese beginner learners. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.665988

[27] Liu, Z., & Dou, J. (2023). Lexical density, lexical diversity, and lexical sophistication in simultaneously interpreted texts: A cognitive perspective. Frontiers in Psychology, 14. https://doi.org/10.3389/fpsyg.2023.1276705

[28] Lu, X. (2010). Automatic analysis of syntactic complexity in second language writing. International Journal of Corpus Linguistics, 15(4), 474–496. https://doi.org/10.1075/ijcl.15.4.02lu

[29] Lu, X. (2012). The relationship of lexical richness to the quality of ESL learners' oral narratives. The Modern Language Journal, 96(2), 190–208. https://doi.org/10.1111/j.1540-4781.2011.01232_1.x

[30] McCarthy, P. M., & Jarvis, S. (2010). MTLD, vocd-D, and HD-D: A validation study of sophisticated approaches to lexical diversity assessment. Behavior Research Methods, 42(2), 381–392. https://doi.org/10.3758/brm.42.2.381

[31] Moqadasizadeh, Z., Tabatabaee Lotfi, S. A., Sarkeshikian, S. A. H., & Afshari, A. (2023). The Effects of Shared, Interactive, and Independent Writing Strategies on EFL Learners' Writing Accuracy and Complexity. ISELT: Interdisciplinary Studies in English Language Teaching, 2(1), 109–1026.

[32] Nation, P. (2012). Research into practice: Vocabulary. Language Teaching, 44(4), 529–539. https://doi.org/10.26686/wgtn.12552143

[33] Read, J. (2000). Assessing vocabulary. Cambridge University Press.

[34] Roth, K., & Dabrowski, J. (2016). Interactive writing across grades a small practice with big results. Taylor & Francis Group.

[35] Rubadue, M. (2002). Sharing the pen. Teaching PreK-8, 32(6), 58–60.

[36] Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensive output in its development. In S. Gass & C. Madden (Eds.), Input in second language acquisition (pp. 235–253), Newbury House. .

[37] Ure, J. (1971). Lexical density and register differentiation. Applications of Linguistics, 23(7), 443–452.

[38] Vidal, K., & Jarvis, S. (2020). Effects of English-medium instruction on Spanish students' proficiency and lexical diversity in English. Language Teaching Research, 24(5), 568–587. https://doi.org/10.1177/1362168818817945

[39] Vygotsky, L. S. (1978). Mind in society: The development of Higher Psychological Processes. Harvard University Press.

[40] Watanabe, Y. (2014). Collaborative and independent writing: Japanese University English Learners' processes, texts and opinions. University of Toronto.

[41] Wigglesworth, G., & Storch, N. (2012). What role for collaboration in writing and writing feedback. Journal of Second Language Writing, 21(4), 364–374. https://doi.org/10.1016/j.jslw.2012.09.005

[42] Wolfe-Quintero, K. (1998). Second language development in writing: Measures of fluency, accuracy, and complexity. University of Hawai'i Press.

[43] Zhou, U., & Dai, Z. (2016). Empirical studies on correlations between lexical knowledge and English proficiency of Chinese EFL learners in Mainland China over the past two decades. Journal of Education and Practice, 7(26), 152–158