



A Microgenetic Development Study of the Complexity, Accuracy, and Fluency of Iranian Intermediate EFL Learners' Writing Performance

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ABSTRACT

This study aimed to investigate the microgenetic development of participants in terms of complexity, accuracy, and fluency in writing. Out of 80 students, twenty eight male and thirty two female participants at an intermediate level of proficiency were selected. The participants were recruited through convenience sampling. The final sample consisted of students who achieved intermediate band scores. These selected participants underwent 10 teaching and testing sessions. They chose two out of three suggested topics and wrote two compositions to be assessed by their teacher. Writing performance was evaluated in the first and tenth sessions for fluency, accuracy, and complexity. Repeated measures MANOVA and post-hoc comparison tests were used to explore writing development over time. The results highlighted students' progress in writing over time. The multivariate analysis of variance showed significant differences in mean scores for poor, average, and high language learners across the sections of complexity, accuracy, and fluency. The implications of these findings could be significant for both educators and curriculum developers and will be discussed.

KEYWORDS: Accuracy, Complexity, Fluency, Microgenetic development, Writing performance

INTRODUCTION

One of the crucial skills for English as a foreign language (EFL) learners is writing (Teng, 2020), which is considered vital for effective communication in learning English (Rusmiyanto et al., 2023). Numerous scholars and educators have highlighted the significance of writing in language acquisition (Farooq et al., 2020). While most individuals may easily master other language skills in their mother tongue, achieving proficiency in writing, especially in a second language, poses a significant challenge (Zhan, Sun, & Zhang, 2021). For instance, within the Iranian context as an EFL environment, numerous scholars (Hasani & Moghadam, 2012; Mirzaii, 2012) have observed that the writing proficiency of foreign language learners is below expectations. On the basis of these factors, English language teaching circles focus more on writing skill (Farooq et al., 2020).



Researchers have emphasized the importance of complexity, accuracy, and fluency (CAF) in second language (L2) writing over the past decade (Phuoc & Barrot, 2022). Generally, CAF measures play an important role in L2 writing research and acts as valid and reliable indices of L2 learners' language development and global proficiency (Lu, 2011; Ortega, 2003). Researchers in the realm of second language acquisition (Ellis, 2003; Ellis & Barkhuizen, 2005; Skehan, 1998) have recognized that second language proficiency, in general, and writing proficiency, in particular, are characterized by multiple components. It is argued that the key dimensions of complexity, fluency, and accuracy can effectively and thoroughly encapsulate these aspects (Hasnain & Halder, 2024). Practically speaking, utilizing CAF measures can serve as a framework for enhancing comprehension of L2 writing performance in classroom settings. (Barrot & Agdeppa, 2021).

The development of writing skills among Iranian EFL learners holds significant importance within the realm of language education. However, the absence of direct and explicit research on the microgenetic development of writing complexity, fluency, and accuracy among Iranian intermediate EFL learners, coupled with the neglect of the role of language proficiency in this domain, presents a notable gap in the existing body of knowledge. Besides, inconsistent results in the previous research studies in the area of writing development through dynamic systems was the main impetus to conduct this study. The main purpose of the present study was, thus, to investigate the participants' microgenetic development in the complexity, accuracy, and fluency in writing. Furthermore, this study aimed to figure out the significant differences in the development of fluency, accuracy, complexity in the written production of intermediate EFL learners across proficiency levels. In order to do this, the following research questions were proposed.

RQ1: Are there any statistically significant differences in the development of complexity, accuracy, and fluency in the written production of intermediate EFL learners across language proficiency?

RQ2: What microgenetic changes do EFL learners' writing performance undergo at different points in time during instruction?

In essence, by addressing these research gaps and objectives, this study sought to contribute to the broader understanding of writing skills development among Iranian EFL learners, thereby enriching the existing knowledge base in this domain.

REVIEW OF THE RELATED LITERATURE

The study of L2 writers, writing, and writing instruction has a relatively short but prolific history that dates back at least to the 1960s (Matsuda et al., 2003). Although formal research on L2 writing has been around since the 1960s, it was about 20 years later that the study of L2 writing became a significant force in teaching English to speakers of other languages.

By the mid-1920s, Werner developed the term microgenesis in order to explain an experimental technique to provoke the genesis and development of percepts in the laboratory (Chen, 2021), so leading improvement as an object of the observation for the researcher (Catan, 1986). Werner (1948) developed some techniques for scaling down developmental phenomena of different extensions in time and at various developmental levels to experimentally reconstruct 'microgenesis', that is the activation and the developmental process of a specific competence in a miniaturized, fast form.



MICROGENETIC DEVELOPMENT

The theory of social culture is a theory of mental development that makes extensive use of the work of Vygotsky (Ageyev, 2003; Taber, 2020). Developmental or genetic analysis of mental functions, the importance of social interaction in individual mental function, and the mediating nature of human action are the three main concepts in Vygotsky-inspired socio-cultural theory (Ellis, 2008). In the genetic study of psychological processes, Vygotsky (1987) distinguishes four areas: (1) phylogenesis, which is related to the evolution of human species; (2) The socio-cultural history that relates to the development of human beings and a particular culture throughout history; (3) ontogenesis, which refers to the growth of a person during his life; and (4) microgenesis, which focuses on cognitive changes that occur in a relatively short period of time in a particular interaction and in a particular socio-cultural environment (Birjandi & Ebadi, 2012).

The most important contributions to Vygotsky-inspired socio-cultural theory have led to second language learning and teaching (Lantolf et al., 2006; Shrestha & Shrestha, 2020). The microgenetic approach is one of these promising contributions that has the potential to deepen the appreciation of SLA researchers and scholars for L2 acquisition and can be used in both laboratory and classroom settings (Hwang et al., 2024). Microgenetic development pertains to the psychological dynamics of a process that can unfold over a span ranging from a few seconds to several hours, or even weeks (Hadidi, 2023).

A number of studies on the genetic development of learners have focused on interlinguistic pragmatism. For example, Van Compernelle and Williams (2012), in a case study, examined the microgenetic development of L2 pragmatic community knowledge in a one-hour concept-based instruction. The results of the microgenetic analysis of the cognitive function (e.g., conceptual knowledge) of an intermediate level French-American language learner in collaboration with an expert instructor demonstrate the positive potential of a concept-based approach to teaching L2 French sociopragmatics.

MICROGENETIC DESIGNS AS EFFECTIVE TOOLS

Microgenetic designs have proposed a promising approach in trying to study processes of change and individual differences in development (Brock et al., 2023). They seek to enable the researcher to look closely at the process of change rather than products. Microgenetic designs focus on micro-development (Fossa et al., 2022). Most of the time, the observation time is almost short (e.g., weeks, months), but it changes the growth periods.

The use of microgenetic designs underlie two main factors. First, only by emphasizing the microgenetic details of children's behavior in specific settings (e.g., communication and /or task-based settings) the type of fine information needed to understand change processes can be obtained. The second assumption is that observing and understanding real-time micro-level changes is essential to understand macro-level changes in growth time. This assumption goes back to Werner (1948) hypothesis about the fundamental commonalities of changes that occur at different time scales and are reinforced by current advances in dynamic systems in the development sciences.

However, the term "microgenetic approach" is largely associated with research into a more cognitive process; researchers who are theoretically different have also supported and combined microgenetic designs. However, only in the last decade, the use of microgenetic designs to explore a wide range of different domains is increasing and expanding. Some of these domains include initial emotional attention (Harris & Pashler, 1996), memory development (Messinger et al., 1999), mother-infant communication (Hsu & Fogel, 2003; Lavelli & Fogel, 2002), motor development (Thelen et al., 1993), primary language development (Ruhland & van Geert, 1998), social writing (Jones, 1998), the impact of instructional practices (Siegler, 2002) and problem-solving strategies in young



children (Chen et al., 2000). It can be argued that this type of "explosion" is perhaps due to advances in both theoretical perspectives and data analysis strategies for studying change processes.

In the context of this study, the focus on microgenesis development involves analyzing the specific moments and stages in which Complexity, Accuracy, and Fluency emerge and progress within the English writing performance of Iranian intermediate EFL learners. This analysis allows researchers to understand not only the overall proficiency level but also the dynamic interplay between different linguistic components as learners produce written English.

In Iran there is a dearth of research specifically focused on the microgenetic development of writing skills among Iranian EFL learners. A copule of researchers have used microgenetic development in their studies. For example, Kazemi et al. (2022) conducted a study which aimed to investigate how the focus of e-collaborative writing tasks and mediation modalities (teacher-led and Google Docs automated) affected the attributes of written language episodes. Findings revealed that form-focused writing tasks generated more written language episodes, grammatical focus dominated in these episodes, and Google Docs automated mediation resulted in more successful resolution of these episodes compared to teacher-led mediation. These results suggest that the focus and mode of mediation can significantly influence the attributes of written language episodes in EFL learners' collaborative writing tasks. In another study, Mohammad Hosseinpur and Parsaeian (2023) investigated the effects of EFL learners' participation in online informal activities on their spoken production skills, particularly fluency and accuracy. Findings indicated that EFL learners' spoken fluency and accuracy can be enhanced through interaction with online informal contexts. Additionally, the study confirmed that each learner follows a unique developmental trajectory, which is shaped by individual usage patterns and dynamic systems. This finding highlights the importance of considering individual differences in language learning and development.

By studying microgenesis development alongside CAF, researchers gain insights into how learners navigate linguistic challenges, refine their language structures, and improve their ability to communicate effectively in written English over time. This approach provides a nuanced understanding of language acquisition processes and informs instructional practices aimed at fostering the development of complexity, accuracy, and fluency in EFL learners.

METHODOLOGY

PARTICIPANTS

The initial count of participants for the study totaled 120 students. However, 60 participants were subsequently excluded from the data analysis due to instances of careless coding and incomplete responses. As a result, the final number of participants consisted of 60 undergraduate EFL learners pursuing degrees in English language and literature, as well as English translation at Islamic Azad University of Zahedan, Iran. Notably, the participants were both male and female students, with 28 males and 32 females. All participants shared Farsi as their native language and fell within the age range of 20 to 35 years old. In order to ensure homogeneity among the EFL learners, the Oxford Quick Placement Test (OQPT) was utilized for assessment. Participants achieving an intermediate level band score on the language proficiency test were subsequently selected for inclusion in the study. Furthermore, it is imperative to note that these individuals had previously completed a paragraph writing course under the supervision of the first researcher conducting the study. The selection of participants was carried out through non-probability sampling, specifically employing convenience sampling, owing to the ease of access to the participants by the researchers. This approach facilitated the efficient and practical inclusion of participants in the study.



INSTRUMENTS

The following instruments were used in this study:

OXFORD QUICK PLACEMENT TEST

The Oxford Quick Placement Test (OQPT) served as a standard assessment with established validity and reliability (Moradi Koochi et al., 2022). In the context of this study, the OQPT was utilized to facilitate the categorization of participants into homogeneous proficiency levels and to ascertain their general language proficiency. Prior to the commencement of the intervention, the OQPT version 2 was administered to ensure the homogeneity of the selected participants in terms of their overall language proficiency in English. It is noteworthy that the OQPT was developed collaboratively by Oxford University Press, University of Cambridge, and Local Examinations Syndicate in 2001 (Tabatabaei & Heidari Shahreza, 2022). This comprehensive assessment can be suitable for English learners across diverse levels and age groups, offering both computer-based and paper-pencil versions. For the purposes of the present study, the paper-pencil version was employed due to its ease of administration and practical considerations.

The OQPT, comprising 60 multiple-choice items focusing on grammar and vocabulary, required an estimated duration of 30 to 45 minutes for completion. Notably, the test was designed to identify participants who achieved the intermediate band score, ranging from 30 to 47, thereby selecting them to partake in the main study. The reliability and validity of the OQPT have been rigorously assessed and reported to be high, rendering it suitable for use as a placement test. In summary, the meticulous utilization of the OQPT in this study serves to ensure the uniformity of participant proficiency levels and contributes to the rigorous assessment of their general language proficiency in English, aligning with the overarching objectives of the research.

WRITING TESTS

The writing proficiency of the participants was evaluated based on predetermined rubrics for writing complexity, accuracy, and fluency, utilizing measures such as T-units, defined as minimal terminal units or independent clauses with attached or embedded dependent clauses, phrases, and words (Wu & Lu, 2024). In order to evaluate their writing capabilities, participants were tasked with selecting and composing two pieces from a choice of three topics aligned with their course book. Specifically, the study employed 'Touchstone 3' by McCarthy et al. (2006), designed for intermediate learners, as the primary course material. Each composition required between 150 to 250 words and the participants were allotted 1 hour to complete the two compositions. The compositions had to contain enough information related to the topic and they had to follow the instruction taught by the teacher.

The assessment of the students' writing performance was conducted at specific intervals throughout the study, specifically during the second, fourth, sixth, eighth, and tenth sessions. This systematic evaluation approach allowed for a comprehensive analysis of their progress and development in writing proficiency over the course of the study.

THREE COMPOSITIONS

The participants were asked to write two compositions on three different predetermined topics based on their course book in descriptive and exploratory types, namely:

1. Covid 19 is a problem facing many countries today. Explain how the governments can possibly reduce the rate of Prevalence.
2. Describe the characteristics of a successful English language teacher in Iran.
3. Explain how motivation can affect teacher burnout in teachers



The compositions consisted of 150 to 250 words. The participants had 50 minutes to write about each predetermined topic. The compositions had to have three parts: introduction, body paragraphs, and conclusion.

T-UNIT GUIDELINE

Polio (1997) generated and issued a guideline by which the systematic determination of T-units and errors was viable. Moreover, Hunt (1970, p. 20) expounded the notion of T-unit as “one main clause with all subordinate clauses attached to it”. Furthermore, other scholars (Ellis & Barkhuizen, 2005; Wolfe-Quintero et al., 1998) argued that T-units were usually used for scrutinizing written and spoken discourse since it had been approved that T-units were in a strong relationship with language proficiency. In sum, the first researcher employed this guideline in order to ascertain T-units and then utilized the rating scale, Profile of Larsen-Freeman (2006) to verify the scores of CAF by the participants.

PROFILE OF LARSEN-FREEMAN

For objective scoring of the compositions written by EFL learners, the first researcher applied the Profile of Larsen-Freeman (2006) that could be an acceptable and reliable rating scale. Larsen-Freeman (2006) explored English language learners' performance by means of an objective assessment. She propounded a profile which used T-units in gauging production language in terms of the three components of accuracy, fluency, and complexity. Furthermore, Larsen-Freeman (2006) gave a precise definition of accuracy, fluency, and complexity in writing respectively as follows:

- 1) Accuracy: The proportion of error-free T-units to total T-units (in terms of lexical, morphological, and syntactic errors);
- 2) Fluency: The average number of words per T-unit; and
- 3) Complexity: The total number of clauses divided by the total number of T-units.

PROCEDURE

To carry out this study, the following steps were taken into consideration: First, before the instruction, the first researcher described the goal of the research to 120 undergraduate students from Islamic Azad University of Zahedan and obtained their consent in order to participate in the study. To have a homogenous sample, the OQPT was distributed among the students. The students who got the band score of intermediate level were chosen as the final samples of the present study. After that, the selected participants ($n = 60$) received 10 sessions of teaching and testing. In other words, the study was done in 10 sessions so that after one session of instruction, the learners could take a test in the next session. Each session lasted 1 hour and 30 minutes. The allotted time to complete the writing tasks was 80 minutes, each task 40 minutes. Furthermore, in the first session the students selected a topic among the suggested topics and wrote a composition. This composition was used as the pre-test of the study. Afterwards, in the tenth session the students selected two topics out of three topics suggested to them and they were required to write two compositions in order to check their writing development. This composition was used as the post-test of the study. Finally, the collected data was analyzed statistically in order to measure CAF in writing.

DATA ANALYSIS

In this study, the participants' written performance was assessed by measuring T-units to evaluate writing complexity. This involved dividing the total number of clauses by the total number of T-units to score writing complexity. Additionally, the proportion of error-free T-units to the total T-units was calculated to estimate the



writing accuracy of EFL learners. Moreover, the average number of words per T-unit was computed to gauge the writing fluency of the students. Subsequently, the collected data underwent analysis using Statistical Package for Social Sciences (SPSS) version 25. The normality assumption of the tests was assessed through the Kolmogorov-Smirnov test. Descriptive statistics were employed to investigate the participants' writing performance. Furthermore, repeated measures MANOVA and post-hoc comparison tests were utilized to explore the complexity, fluency, and accuracy of writing development over time.

RESULTS

COMPARISON OF MEAN POST-TEST SCORES OF COMPLEXITY, ACCURACY AND FLUENCY IN TERMS OF LANGUAGE PROFICIENCY

In examining the interdependent facets of complexity, accuracy, and fluency within the language skills test, multivariate analysis of variance (MANOVA) was employed to conduct comparisons.

As an initial step and in order to assess the normality of the data, the Kolmogorov-Smirnov test was run. As can be seen in Table 1, the mean post-test scores for the variables complexity, accuracy and fluency for language learners who were at a poor level were 6.20, 2.30 and 21.40, respectively, for language learners who were at an average level were 7.21, 3.17 and 22.43, respectively, and for language learners who were at the higher level, it was 8.31, 3.70 and 24.34, respectively. Also, the values of skewness and elongation for all three variables in the three groups are between 2- and +2, which indicates that the distribution of data are normal.

Table 1
Kolmogorov-Smirnov Normality Test

final.group		post.complexity	post.accuracy	post.fluency
1.00	Mean	6.2000	2.3000	21.4000
	Std. Deviation	1.39841	.98658	2.95146
	Skewness	1.085	.115	.580
	Kurtosis	.265	-.484	-1.403
2.00	Mean	7.2131	3.1721	22.4262
	Std. Deviation	1.77120	.59976	2.23203
	Skewness	-.353	-.520	-.504
	Kurtosis	-.759	-.235	-.603
3.00	Mean	8.3103	3.7000	24.3448
	Std. Deviation	1.28462	.50427	1.56470
	Skewness	-.740	-.946	-.742
	Kurtosis	.368	1.444	-.479
Total	Mean	7.4300	3.2380	22.8800
	Std. Deviation	1.71891	.72971	2.34103
	Skewness	-.402	-.884	-.556
	Kurtosis	-.747	.829	-.650

The main results of MANOVA are shown in Table 2. It is observed that the significance level of the group variable for the three variables complexity, accuracy and fluency is 0.001, 0.000 and 0.000, respectively, which are less than 0.05. Therefore, it can be said that in the post-test, there was a significant difference between the mean scores of poor, average and high language learners in the three sections of complexity, accuracy and fluency.



Table 2
Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	post.complexity	40.474 ^a	2	20.237	7.788	.001
	post.accuracy	15.253 ^b	2	7.626	19.747	.000
	post.fluency	96.690 ^c	2	48.345	10.518	.000
Intercept	post.complexity	3127.787	1	3127.787	1203.776	.000
	post.accuracy	557.596	1	557.596	1443.754	.000
	post.fluency	30802.028	1	30802.028	6701.053	.000
final.group	post.complexity	40.474	2	20.237	7.788	.001
	post.accuracy	15.253	2	7.626	19.747	.000
	post.fluency	96.690	2	48.345	10.518	.000
Error	post.complexity	252.036	97	2.598		
	post.accuracy	37.463	97	.386		
	post.fluency	445.870	97	4.597		
Total	post.complexity	5813.000	100			
	post.accuracy	1101.180	100			
	post.fluency	52892.000	100			
Corrected Total	post.complexity	292.510	99			
	post.accuracy	52.716	99			
	post.fluency	542.560	99			

a. R Squared = .138 (Adjusted R Squared = .121)

b. R Squared = .289 (Adjusted R Squared = .275)

c. R Squared = .178 (Adjusted R Squared = .161)

The Bonferroni test was conducted to discern differences between groups. The outcomes are shown in Table 3. Notably, items marked with * denote a significant distinction between the two groups. Specifically, in terms of complexity and accuracy variables, the mean scores of excellent learners exhibit a significant elevation compared to those of average and poor learners. Furthermore, regarding accuracy, the scores of excellent learners markedly surpass those of average learners, and the mean score of the average learners notably exceeds that of the poor learners.



Table 3
Bonferroni Test for Pairwise Comparisons

Dependent Variable	(I) final.group	(J) final.group	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
						Lower Bound	Upper Bound
post. complexity	1.00	2.00	-1.013	.550	.205	-2.353	.327
		3.00	-2.110*	.591	.002	-3.550	-.670
	2.00	1.00	1.013	.550	.205	-.327	2.353
		3.00	-1.097*	.364	.010	-1.983	-.211
	3.00	1.00	2.110*	.591	.002	.670	3.550
post. accuracy	1.00	2.00	1.097*	.364	.010	.211	1.983
		3.00	-1.400*	.228	.000	-1.955	-.845
	2.00	1.00	-.872*	.212	.000	-1.389	-.356
		3.00	1.400*	.228	.000	.845	1.955
	3.00	1.00	1.400*	.228	.000	.845	1.955
post. fluency	1.00	2.00	-.528*	.140	.001	-.869	-.186
		3.00	.528*	.140	.001	.186	.869
	2.00	1.00	-1.026	.731	.491	-2.808	.756
		3.00	-2.945*	.786	.001	-4.860	-1.029
	3.00	1.00	1.026	.731	.491	-.756	2.808
		3.00	-1.919*	.484	.000	-3.097	-.740
		1.00	2.945*	.786	.001	1.029	4.860
		2.00	1.919*	.484	.000	.740	3.097

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Finally, exact examination of participants' gradual progression or microgenetic development in complexity, accuracy, and fluency was central to this study. By investigating students' writing, the researchers figured out the total number of omissions, sentence combinations, generalizations, inventions, verbatim copying used by students in writing sessions. Most of the participants (55 ones) used deletion in their compositions, but deletion was used by 37 participants after receiving treatment. Approximately 15 students used sentence combination strategies before instruction in their first composition. This trend steadily increased to 59 students in the tenth session. The low frequency of syntactic transformation in the first writing, 11 cases, indicates that learners were reluctant or unable to use this strategy. This trend steadily increased to 48 students in the tenth session. So, it is clear that Treatment has slightly improved students' ability to use this strategy.

Also, the low frequency of paraphrasing in the first writing, 15 cases, indicates that learners were reluctant or unable to use this strategy. This trend steadily increased to 53 students in the tenth session. So, it is clear that Treatment has slightly improved students' ability to use this strategy.



Table 4
Writing Sessions Frequencies

Row	Deletion	Sentence combination	syntactic transformation	Paraphrasing
Pretest	85	15	11	15
post test	37	59	48	53

DISCUSSION

The main purpose of this study was to carefully examine the microgenetic development of the participants in writing. The results of the study highlighted students' writing progress over time. As shown in Table 4, all participants were successful in using the deletion strategy, even before the instruction in the first session; they used deletion strategy to write the source text. This finding supports previous findings (Brown & Day, 1983; Brown, Day, & Jones, 1983;) that eliminating redundant information is a simple strategy in writing. This result can be further justified by research in text comprehension and summarization strategies, which suggests that deletion is a fundamental cognitive skill used to distill information into its essential components (Hosseinpour, 2015). The ease with which participants employed this strategy aligns with findings by Graham and Perin (2007), who argued that simpler strategies like deletion form the building blocks of more advanced writing skills. Additionally, the intuitive use of deletion prior to instruction may reflect the participants' ability to recognize and focus on relevant information, as supported by cognitive processing theories that emphasize the role of selective attention in effective writing (Pressley & Afflerbach, 1995). These findings highlight the significance of incorporating deletion strategies in writing instruction to foster students' ability to summarize and organize information effectively.

According to previous research findings (Saddler & Graham, 2005; Saddler & Saddler, 2010), the results of this study also showed that strategies were used during participants' sentence combination training. It increased from 15 to 59 students in the tenth session. During the course of learning English, EFL learners are usually trained through separate grammar sections to understand sentence structure. However, this type of training does not seem to be effective in improving the writing ability of language learners (Graham & Perin, 2007). Sentence combination, as supported by Saddler and Graham (2005), is a more integrative approach that emphasizes syntactic complexity and coherence, allowing learners to develop better control over sentence variety and complexity in writing. This is in line with findings by Myhill et al. (2012), showing that explicit instruction in sentence combination strategies can enhance both syntactic variety and overall text quality in student writing.

Consistent with the findings of previous studies (Saddler & Graham, 2005; Saddler & Saddler, 2010), the results of this study also showed that in the course of instruction the participants' sentence combination strategy use instances increased steadily from 15 to 59 students in the tenth session. However, it seems that this kind of instruction is effective in improving learners' writing ability (Graham & Perin, 2007). Sentence combination instruction encourages learners to actively engage with syntactic structures, which supports Swain's (1995) output hypothesis, emphasizing the role of language production in language development. Moreover, Hillocks (1986) argues that teaching sentence combining as a strategy enhances students' syntactic maturity and writing fluency, making it an indispensable tool for developing complex writing abilities.

Through the paraphrasing strategy, learners were taught to copy from a source text and then delete some words, altering grammatical structures, or plugging in one synonym for another. The performance of the participants



indicated that the process of using this strategy had increased in ten collection sessions. Encouraging learners to use synonyms and familiarize them with paragraph structures during training can be the main reason for this progress. This finding is still a step forward for the novice writers and supports previous studies (Gebril & Plakans, 2009; Keck, 2006). This is in line with research by McCarthy and McNamara (2021). Their results revealed that paraphrasing fostered deeper engagement with the text and helped learners develop a more nuanced understanding of linguistic structures. Additionally, research by Hyland (2003) emphasized that strategies like paraphrasing were critical for EFL learners as they helped in both avoiding plagiarism and improving their ability to express ideas with linguistic variation. This progress demonstrates the value of paraphrasing as an instructional tool to enhance both lexical diversity and structural variety in learners' writing.

CONCLUSION AND IMPLICATIONS

In conclusion, this study aimed to investigate the microgenetic development of participants in writing, with a focus on the strategies employed and their progress over time. The findings revealed the success of all participants in employing the deletion strategy, even prior to instruction, which is consistent with previous research indicating its effectiveness in eliminating redundant information in writing. Furthermore, the results demonstrated an increase in the use of sentence combination strategies throughout the instructional sessions, suggesting its effectiveness in improving writing ability, contrary to the traditional separate grammar-based instruction. The progressive increase in the use of the paraphrasing strategy among participants over the course of the study indicates its efficacy in enhancing learners' familiarity with paragraph structures and synonym usage. These findings align with earlier studies and signify a positive step forward for novice writers. Overall, the study sheds light on the importance of explicit instruction in writing strategies and their impact on learners' writing abilities.

Based on the findings of this study, teachers and instructional designers can implement several strategies to improve learners' writing abilities. One such strategy is to utilize explicit instruction in writing strategies, specifically deletion, sentence combination, and paraphrasing. Providing opportunities for learners to practice these strategies in authentic writing tasks and receiving feedback can help them identify areas for improvement. Furthermore, encouraging learners to reflect on their own writing process can assist them in recognizing where they can eliminate redundant information or combine sentences for greater clarity and coherence. These strategies, informed by the findings of this study, can significantly enhance learners' writing abilities and overall proficiency.

Also, the present study offers several important findings that could provide agendas for further research. Given the consistent success of the deletion strategy across participants, it would be worthwhile to investigate whether it is equally effective in different genres of writing, such as academic and creative. Additionally, further research could explore the potential impact of combining the sentence combination and paraphrasing strategies on writing development. Moreover, individual differences, such as prior writing experience and motivation, could be examined to understand how these factors influence the effectiveness of explicit instruction in writing strategies.

The implications of the findings of this study are significant for both educators and curriculum developers. The successful utilization of strategies such as deletion, sentence combination, and paraphrasing by the participants underscores the importance of explicitly teaching writing strategies to students. Instructors can take advantage of these insights to design instructional approaches that prioritize the development of these strategies, thereby enhancing students' writing skills and fostering their ability to effectively convey their ideas.

Furthermore, the study's findings indicating that traditional grammar-based instruction may not be effective in improving language learners' writing abilities suggest the need for a reevaluation of pedagogical methods. Educators may consider incorporating more integrated and strategy-focused approaches to teaching writing, providing learners with opportunities to practice and refine their use of strategies such as sentence combination and paraphrasing.



Additionally, the observed progress in participants' utilization of the paraphrasing strategy highlights the potential benefits of training students to utilize synonyms and become familiar with paragraph structures. This finding supports the idea that instruction focused on encouraging the use of synonyms and developing an understanding of paragraph structures can contribute to the advancement of novice writers (Cheung, 2016).

REFERENCES

- Ageyev, V. S. (2003). Vygotsky in the mirror of cultural interpretations. In A. Kozulin, B. Gindis, V. S. Ageyev, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 432-449). Cambridge, Cambridge University Press.
- Barrot, J. S., & Agdeppa, J. Y. (2021). Complexity, accuracy, and fluency as indices of college-level L2 writers' proficiency. *Assessing Writing*, 47, 100510. doi.org/10.1080/17404620802382680
- Birjandi, P., & Ebadi, S. (2012). Microgenesis in dynamic assessment of L2 learners' socio-cognitive development via web 2.0. *Procedia-Social and Behavioral Sciences*, 32, 34-39. doi.org/10.1016/j.sbspro.2012.01.006
- Brock, R., Taber, K. S., & Watts, D. M. (2023). Assembly required: a microgenetic multiple case study of four students' assemblages when learning about force. *International Journal of Science Education*, 1-21. doi.org/10.1080/09500693.2023.2269616
- Brown, A. L., & Day, J. D. (1983). Macrorules for summarizing texts: The development of expertise. *Journal of Verbal Learning and Verbal Behavior*, 22(1), 1-14. doi.org/10.1016/S0022-5371(83)80002-4
- Brown, A. L., Day, J. D., & Jones, R. S. (1983). The development of plans for summarizing texts. *Child Development*, 968-979. doi.org/10.2307/1129901
- Brown, J. W. (2015). *Microgenetic theory and process thought*. Exeter: Imprint Academic.
- Catan, L. (1986). The dynamic display of process: Historical development and contemporary uses of the microgenetic method. *Human Development*, 29, 252-63. doi.org/10.1159/000273062
- Chen, L. (2021, November). A brief review of microgenetic method in second language acquisition research. In *7th International Conference on Social Science and Higher Education (ICSSHE 2021)* (pp. 100-106). Atlantis Press.
- Chen, Z., Siegler, R. S., & Daehler, M. W. (2000). Across the great divide: Bridging the gap between understanding of toddlers' and older children's thinking. *Monographs of the Society for Research in Child development*, i-viii+1-105.
- Cheung, Y. L. (2016). Teaching writing. In W. A. Renandya, & H. P. Widodo (Eds.), *English language teaching today: Linking theory and practice* (pp. 179-194). Springer International.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.
- Ellis, R. (2008). *The study of second language acquisition*. Oxford: Oxford University Press.
- Ellis, R., & Barkhuizen, G. (2005). *Analyzing learner language*. Oxford: Oxford University Press.
- Farooq, M. S., Uzair-Ul-Hassan, M., & Wahid, S. (2012). Opinion of second language learners about writing difficulties in English language. *South Asian Studies*, 27(1), 183-194.



- Fossa, P., Cortés, C., Molina, M. E., Barros, M., Marcotti, C. M., Sprovera, I., & Novoa, J. T. (2022). Microgenetic analysis of thought trajectories: A mixed design. *Integrative Psychological and Behavioral Science*, 56(3), 630-652. doi.org/10.1007/s12124-021-09633-9
- Gebril, A., & Plakans, L. (2009). Investigating source use, discourse features, and process in integrated writing tests. *Spain Fellow Working Papers in Second or Foreign Language Assessment*, 7, 47–84
- Graham, S., & Perin, D. (2007). What we know, what we still need to know: Teaching adolescents to write. *Scientific Studies of Reading*, 11(4), 313-335. doi.org/10.1080/10888430701530664
- Hadidi, A. (2023). Comparing summative and dynamic assessments of L2 written argumentative discourse: Microgenetic validity evidence. *Assessing Writing*, 55, 100691. doi.org/10.1016/j.asw.2022.10069
- Harris, C. R., & Pashler, H. (2004). Attention and the processing of emotional words and names: Not so special after all. *Psychological Science*, 15(3), 171-178. doi.org/10.1111/j.0956-7976.2004.0150300
- Hasani, M. T., & Moghadam, C. R. (2012). The effect of self-assessment on Iranian EFL learners' writing skills. *The Iranian EFL Journal*, 8(5), 371-388.
- Hasnain, S., & Halder, S. (2024). Intricacies of the multifaceted triad-complexity, accuracy, and fluency: A review of studies on measures of oral production. *Journal of Education*, 204(1), 145-158. doi.org/10.1177/00220574221101377
- Hillocks, G. (1986). *Research on written composition: New directions for teaching*. Urbana, IL: National Council of Teachers of English.
- Hosseinpour, R. M. (2015). The impact of teaching summarizing on EFL learners' microgenetic development of summary writing. *The Journal of Teaching Language Skills*, 5(1), 71–90.
- Hsu, H. & Fogel, A. (2003). Stability and transitions in mother–infant face-to-face communication during the first 6 months: A microhistorical approach. *Developmental Psychology*, 39, 1061–82. doi.org/10.1037/0012-1649.39.6.1061
- Hunt, K. W. (1970). Syntactic maturity in schoolchildren and adults. *Monographs of the Society for Research in Child Development*, 35(1), iii-67.
- Hwang, G. J., Rahimi, M., & Fathi, J. (2024). Enhancing EFL learners' speaking skills, foreign language enjoyment, and language-specific grit utilizing the affordances of a MALL app: A microgenetic perspective. *Computers & Education*, 105015. doi.org/10.1016/j.compedu.2024.105015
- Hyland, K. (2003). *Second language writing*. Cambridge University Press.
- Jones, I. (1998). Peer relationships and writing development: A microgenetic analysis. *British Journal of Developmental Psychology*, 68, 229–41. doi.org/10.1111/j.2044-8279.1998.tb01286.x
- Kazemi, P., Pourdana, N., Famil Khalili, F., & Nour, P. (2022). Microgenetic analysis of written languaging attributes on form-focused and content-focused e-collaborative writing tasks in Google Docs. *Education and Information Technologies*, 27(8), 1-24. doi.org/10.1007/s10639-022-11039-y
- Keck, C. (2006). The use of paraphrase in summary writing: A comparison of L1 and L2 writers. *Journal of Second Language Writing*, 15(4), 261-278. doi.org/10.1016/j.jslw.2006.09.006
- Lantolf, J. P., & Thorne, S. (2006). *Sociocultural theory and the genesis of second language development*. Oxford: Oxford University Press.
- Larsen-Freeman, D. (2006). On the need for a new understanding of language and its development. *Journal of Applied Linguistics*, 3(3), 281–304. doi.org/10.1558/japl.v3.i3.281



- Larsen-Freeman, D. (2006). The emergence of complexity, fluency and accuracy in the oral and written production of five Chinese learners of English. *Applied Linguistics*, 27(4), 590-619. doi.org/10.1093/applin/aml029
- Lavelli, M. & Fogel, A. (2002). Developmental changes in mother–infant face-to-face communication: Birth to 3 months. *Developmental Psychology*, 38, 288–305. doi.org/10.1037/0012-1649.38.2.288
- Lu, X. (2011). A corpus-based evaluation of syntactic complexity measures as indices of college-level ESL writers' language development. *TESOL Quarterly*, 45(1), 36-62. doi.org/10.5054/tq.2011.240859
- McCarthy, M., McCarten, J., & Sandiford, H. (2006). *Touchstone level 3 student book with audio CD/CD-ROM*. Cambridge: Cambridge University Press.
- McCarthy, K. S., & McNamara, D. S. (2021). The multidimensional knowledge in text comprehension framework. *Educational Psychologist*, 56(3), 196-214. doi.org/10.1080/00461520.2021.1872379
- Messinger, D. S., Fogel, A., & Dickson, K. L. (1999). What's in a smile? *Developmental Psychology*, 35, 701–8. doi.org/10.1037/0012-1649.35.3.701
- Mirzaii, M. (2012). Consciousness-raising instruction and its effect on Iranian EFL learners' use of the mechanics of writing. *The Iranian EFL Journal*, 8(5), 139-156.
- Mohammad Hosseinpour, R., & Parsaeian, Z. (2023). Accuracy and fluency development of spoken English through online informal activities: A microgenetic analysis. *Journal of Modern Research in English Language Studies*, 10(2), 1- 25. doi.org/10.30479/jmrels.2022.17417.2082
- Moradi Koochi, A., Rahimi Esfahani, F., & Shafiee, S. (2022). Effects of competency-based approach on enhancing complexity, accuracy, and fluency of writing among Iranian Upper-intermediate pre-service teachers. *Iranian Journal of Educational Sociology*, 5(4), 9-22. doi.org/ 10.61186/ijes.5.4.9
- Myhill, D. A., Jones, S. M., Lines, H., & Watson, A. (2012). Re-thinking grammar: The impact of embedded grammar teaching on students' writing and students' metalinguistic understanding. *Research Papers in Education*, 27(2), 139-166. doi.org/10.1080/02671522.2011.637640
- Nosratinia, M., & Razavi, F. (2016). Writing complexity, accuracy, and fluency among EFL learners: Inspecting their interaction with learners' degree of creativity. *Theory and Practice in Language Studies*, 6(5), 1043-1052. doi.org/10.17507/tpls.0605.19
- Ortega, L. (2003). Syntactic complexity measures and their relationship to L2 proficiency: A research synthesis of college-level L2 writing. *Applied Linguistics*, 24(4), 492–518. doi.org/10.1093/applin/24.4.492
- Phuoc, V. D., & Barrot, J. S. (2022). Complexity, accuracy, and fluency in L2 writing across proficiency levels: A matter of L1 background?. *Assessing Writing*, 54, 100673. doi.org/10.1016/j.asw.2022.100673
- Polio, C. G. (1997). Measures of linguistic accuracy in second language writing research. *Language Learning*, 47(1), 101-143. doi.org/10.1111/0023-8333.31997003
- Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Hillsdale, NJ: Erlbaum.
- Ruhland, R. & van Geert, P. (1998). Jumping into syntax: Transitions in the development of closed class words. *British Journal of Developmental Psychology*, 16, 65–95. doi.org/10.1111/j.2044-835X.1998.tb00750.x
- Rusmiyanto, R., Huriati, N., Fitriani, N., Tyas, N. K., Rofi'i, A., & Sari, M. N. (2023). The role of artificial intelligence (AI) in developing english language learner's communication skills. *Journal on Education*, 6(1), 750-757. doi.org/10.31004/joe.v6i1.2990
- Saddler, B., & Graham, S. (2005). The effects of peer-assisted sentence-combining instruction on the writing performance of more and less skilled young writers. *Journal of Educational Psychology*, 97(1), 43-54.



- Saddler, K., & Saddler, B. (2010). Planning instruction and self-regulation training: Effects on writers with autism spectrum disorders. *Exceptional Children*, 77(1), 107-124. doi.org/10.1177/001440291007700105
- Shrestha, P. N (2020). Sociocultural theory, dynamic assessment and academic writing. In P. N. Shrestha (2020). *Dynamic assessment of students' academic writing. vygotskian and systemic functional linguistic perspectives* (pp.35-58). Switzerland: Springer.
- Siegler, R. S. (2002). Microgenetic studies of self-explanation. In N. Granott & J. Parziale (eds.), *Microdevelopment. Transition processes in development and learning* (pp. 31–58). Cambridge, MA: Cambridge University Press.
- Skehan, P. (1998). *A cognitive approach to language learning*. Oxford: Oxford University Press.
- Swain, M. (1995). Three functions of output in second language learning. In G. Cook & B. Seidlhofer (Eds.), *Principle and practice in applied linguistics* (pp. 125–144). Oxford University Press.
- Tabatabaei, O., & Heidari Shahreza, M. A. (2022). Using the STAD model of instruction to enhance learners' general achievement and creativity. *Journal of Language and Translation*, 12(1), 125-139. doi.org/10.30495/tlt.2022.688344
- Taber, K. S. (2020). Mediated learning leading development: The social development theory of Lev Vygotsky. In B. Akpan & T. Kennedy (Eds.), *Science education in theory and practice: An introductory guide to learning theory* (pp. 277–291). Switzerland: Springer.
- Teng, F. (2020). The role of metacognitive knowledge and regulation in mediating university EFL learners' writing performance. *Innovation in Language Learning and Teaching*, 14(5), 436-450. doi.org/10.1080/17501229.2019.1615493
- Thelen, E., Corbetta, D., Kamm, K., Spencer, J. P., Schneider, K., & Zernicke, R. F. (1993). The transition to reaching: Mapping intention and intrinsic dynamic. *Child Development*, 64, 1058–98. doi.org/10.1111/j.1467-8624.1993.tb04188.x
- Van Compernelle, R. A., & Williams, L. (2012). Promoting sociolinguistic competence in the classroom zone of proximal development. *Language Teaching Research*, 16(1), 39-60. doi.org/10.1177/1362168811423340
- Van der Veer, R. (1996). The concept of culture in Vygotsky's thinking. *Culture & Psychology*, 2(3), 247-263. doi.org/10.1177/1354067X9600200302
- Vygotsky, L. S. (1987). *The collected works of LS Vygotsky: Problems of the theory and history of psychology* (Vol. 3). Springer Science & Business Media.
- Werner, H. (1948). *Comparative psychology of mental development*. New York: International Universities Press.
- Wolfe-Quintero, K., Inagaki, S., & Kim, H.-Y. (1998). *Second language development in writing: Measures of fluency, accuracy & complexity* (Technical Report #17). Honolulu: University of Hawai'i, Second Language Teaching and Curriculum Center.
- Wu, J., & Lu, X. (2024). Noun phrase complexity and second language Chinese proficiency: An analysis of narratives by Korean learners of Chinese. *Assessing Writing*, 59, 100810. doi.org/10.1016/j.asw.2024.100810
- Zhan, J., Sun, Q., & Zhang, L. J. (2024). Effects of manipulating writing task complexity on learners' performance in completing vocabulary and syntactic tasks. *Language Teaching Research*, 28(3), 1011-1032. doi.org/10.1177/13621688211024360