

## Research Article

# Developing Productive Language Skills Using Artificial Intelligence Tools

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### ABSTRACT

The use of technological tools, particularly during the pandemics has become a widespread practice, and as for the EFL contexts, it is not surprising to see a wide range of applications. In this context, the present study aims to increase the quality of productive skills through the provision of cohesive and coherence devices, which is a significant problem for non-native speakers. Therefore, in order to enable a learner to create qualified utterances or texts, a sound background information for the use of cohesive devices such as lexical synonyms, pronouns, parallelism and linking words is needed. With this problem on the agenda, this study used artificial intelligence tools (see the References) to let the learners create good quality paragraphs bearing the features mentioned. The participants of the study are 60 freshman students, whose written documents were investigated to identify the source of the missing items leading to the creation of poor portions of language deprived of linguistic devices. Moreover, the participants took part in the application which aimed to teach the use of mechanical devices for the purpose of unity, coherence and cohesion. The pre and post test results of the students indicated that there is a statistically significant difference between the results. After taking part in such a study, the participants reported that using AI-powered cohesive devices helped them to create effective oral and written productions.

### KEYWORDS

Cohesion, coherence, writing skill, speaking skill, AI tools



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## INTRODUCTION

English, as a global language, is an educational need in the 21<sup>st</sup> century. Emphasizing the role of English, Warschauer (2000) points out that English language teachers need to pay attention to the social, economic, cultural, and linguistic results of global English in their classroom settings. In this respect, developing learners' productive skills such as writing and speaking is an educational need in order to enhance their communication in English. Improving the flow (cohesion) and the logic (coherence) in a paragraph is of utmost importance for the transfer of the items needed for an uninterrupted and sensible communication. In this respect, it can be said that cohesive devices work as the glue to connect the sentences to each other securely, while coherence, as the blueprint of any given architecture, can be attained thanks to some linguistic elements such as parallelism, signposts, relevance, logical order, tense consistency, etc. In this regard, the emergence of the need for the 4Cs (clarity, coherence, conciseness, and consistency) also come to stage for the creation of an effective content that will accord with the audience or the reader.

On the other hand, when research related to coherence and cohesion-key elements for textuality-are considered, it can be understood that teaching coherence in its classical form is rather challenging. In a case study, Lee (2002) pointed out that students found the coherence lessons boring because of the heavy academic load in a communication class. As for Trebits (2009), students often use a small set of simple transition words. While their writing was "glued together" (cohesive), it often lacked the "logical depth" (coherence) found in expert writing because they didn't use a wide enough variety of logical connectors. In this regard, writing and speaking as productive skills has been the concern of many studies so far. With the advancement of technology, the voices from the classroom often ask for the incorporation of technology into the daily practice of the teachers.

From the early days of the integration on, technology has always contributed to language classrooms. Genç-Ilter (2009) stated that EFL students would like their teachers to employ technology in the classrooms. Most students claimed that using technology increased their motivation, and they pointed out that the most important equipment was computer-connected projector in the classrooms. Furthermore, the studies in the literature highlighted the effects of using technology on writing skills. Mak & Coniam (2008) pointed out that thanks to wikis, students could write more coherent and accurate texts. In another study, Al-Jarf (2004) noted that web based instruction had positive effects on developing

writing skills. In a recent study, Song & Song (2023) stated that the research they conducted as for the role of AI in improving language competence and instructional practices in EFL education produced fruitful results and that AI-assisted learning leads to significantly better writing outcomes and higher student engagement than traditional teaching methods. A study in a similar vein, Perez and Altamirano Carvajal (2025) indicated that there were improvements in learners' language abilities, with average gains in receptive skills slightly higher than in productive ones, and student satisfaction was at high level. In terms of teachers' perspective, integrating such AI tools might also pave the way for teachers to build confidence about instructional tools to be used for productive skills (Williyan et al., 2025).

Besides coherence, cohesion is stated to be a problem in the course of writing skill, as one of the important standards of textuality (Witte & Faigley, 1981; Ahmed, 2010; McNamara, 2010; Tuan, 2010; Zergollern-Miletić & Horváth, 2010). Though the students try to use some cohesive devices, learners make mistakes and have difficulty in using them. On this issue, Witte & Faigley (1981) pointed out that students needed to go across "sentence boundaries" to create a whole text. Therefore, in order to make the students connect the sentences coherently, they need to be taught some cohesive devices. To teach those cohesive devices effectively, this study used AI tools (see the References). The reason for using this tool lies behind the potential of technological tools to teach conjunctions and many other language skills as well as teaching grammar and particularly conjunctions (Lacina, 2005; Hegelheimer & Fisher, 2006; Chomchiawchan & Khampusean, 2012; Amyatun and Kholis, 2023 among others). The research questions are as follows:

1. Is there a significant difference in the scores of the students after using AI?
2. To what extent does AI help them to foster their productive skills?

## METHOD

The present study applied the one-group pre test-post test design (Creswell and Creswell, 2018). The design was adopted to measure the effect of an instruction for the appropriate use of discourse competence within a single group before and after the implementation of AI powered tools.

### Participants

The participants of the study are 60 freshman students, and they learnt the textuality standards via AI. Their level is B2, and they study at a state university in Türkiye.

## Procedure

As the first step, the study group was chosen in line with purposive sampling. The students were taking oral communication skills course at the period of the study, and they were having presentations in which they were presenting a genre such as a documentary programme and a music programme. While they were having those presentations, the lecturer observed that they were not using cohesive or coherence devices not only in their presentations but also in their slides. Therefore, the instructor used a wall to teach how to use such devices with the group. Since Granger & Tyson (1996) emphasized the use of authentic texts in teaching connectors, the texts with target cohesive devices obtained from various magazines were also shared on the wall. The screenshots in Figure 1 show these cohesive devices.

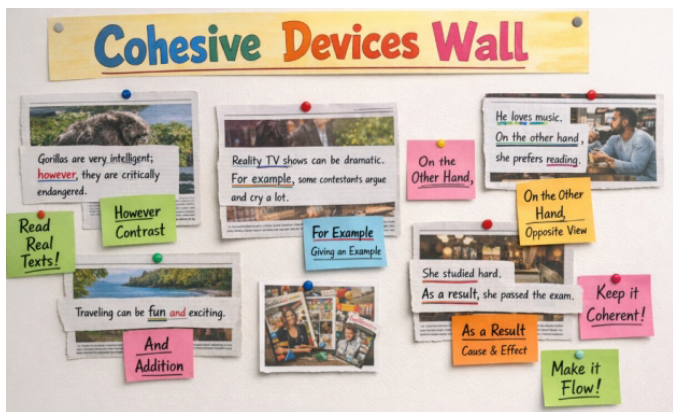


Fig. 1: The screenshot from the wall prepared via AI tools to teach cohesive devices in a paragraph (see the References)

After that, at the end of the term, before they had discussions or debates, the lecturer asked them to write down a paragraph about the following week's topic so that they can brainstorm and use some devices. The lecturer analyzed those paragraphs not only by a rubric traditionally but also with the AI program (See the References). Getting feedback from the lecturer and AI tutor, the students got ready for the discussions and debates, and these paragraphs were evaluated as post test.

In line with the steps in Figure 2, as already mentioned above, the participants noted down paragraphs. Figure 3 below shows one of these paragraphs with the feedback of AI and the lecturer.

## FINDINGS

Findings are going to be presented under the research questions section individually.

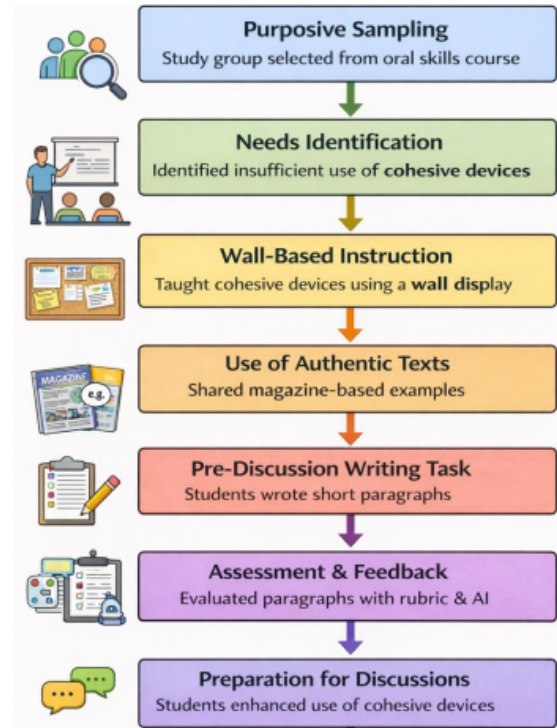


Fig. 2: Steps followed in the study

### Scoring by the Lecturer

Criterion	Score
Content	3 / 4
Organization	2 / 4
Grammar & Accuracy	2 / 4
Vocabulary Use	3 / 4
Cohesion & Coherence	2 / 4
<b>Total Score</b>	<b>12 / 20</b>

### Entry O: Fish

Criterion	Score	Rationale
Content & Task Achievement	3 (Good)	Focuses clearly on history as essential identity, using effective metaphor: forgetting means "deleting our essence".
Organization & Cohesion	3 (Good)	Logical cause-and-effect structure.
Vocabulary (Lexical Resource)	3 (Good)	Good vocabulary: "essence," "accomplish," "snatch it away".
Grammar (Grammatical Range & Accuracy)	3 (Good)	Good control, relies mostly on simple conditional sentences.
Mechanics (Punctuation, Spelling, Capitalization)	2 (Satisfactory)	Errors in spelling and punctuation ("human," "dont," missing articles).
Inferred AI Plausibility	2 (Low Plausibility)	Handwritten, uses several minor errors typical of student work. The ideas are sound but execution has slips.
<b>Total Score</b>	<b>16/24</b>	
<b>Error Analysis (Entry O):</b>		
• Spelling/Mechanics: "human" (human); "dont" (don't).		

Fig. 3: Writing rubric scoring by the lecturer and AI

Research Question 1: Is there a significant difference in the scores of the students after using AI?

Students' speaking and writing performances were assessed via rubrics adapted from the frameworks in language assessment (Brown, 2004; Jacobs et al., 1981; Luoma, 2004). The speaking rubric evaluated fluency, pronunciation, grammatical accuracy, vocabulary range, and coherence, while the writing rubric focused on content, organization, grammatical accuracy, vocabulary use, and cohesion. Each criterion was rated through a four-point scale, yielding a maximum score of 20 for each skill, later converted into 100 points range according to the faculty's grading rules. The pre and post test results (gathered via the to assess paragraph) of the students indicate that there is a statistically significant difference between their results. The data was analyzed via a statistical package program (see the References). Table 1 below shows the paired samples test results for the writing achievement scores of the group.

Table 1: Paired Samples t-test results for writing scores

	Mean	T	Sig. (2-tailed)
Pre test	78.735	.124	.736
Post test	81.325	7.686	.000

In line with Table 1, the class can be said to demonstrate a higher level of achievement in writing skill, as revealed by the improved mean scores in the final assessment. There is a statistically significant difference between pre and post test scores ( $p = .000$ ). The rise in post-test mean scores shows that the integration of AI tools might have been an effective instructional policy to boost the

learners' productive skills as for standards of textuality. This means that the group utilized the instruction provided by AI, which empowered a remarkable boost in productive skills. In addition to the quantitative data analysis, the ideas of the students, collected in semi structured interviews, were evaluated through content analysis. Table ... below displays the content analysis results with themes, categories, codes and example quotes.

Table 2: Paired Samples t-test results for speaking scores

	Mean	T	Sig. (2-tailed)
Pre test	68.150	.087	.645
Post test	74.039	8.098	.004

In line with Table 2, the class can be said to demonstrate a higher level of achievement in writing skill, as revealed by the improved mean scores in the final assessment. There is a statistically significant difference between pre and post test scores ( $p = .000$ ). The rise in post-test mean scores shows that the integration of AI tools might have been an effective instructional policy to boost the learners' productive skills as for standards of textuality. This means that the group utilized the instruction provided by AI, which empowered a remarkable boost in productive skills.

### Research Question 2: To what extent does AI help them to foster their productive skills?

In addition to the quantitative data analysis, the ideas of the students, collected in semi structured interviews, were evaluated through content analysis. Table 3 below

Table 3: Codebook for Content Analysis

Theme	Category	Code	Example Quote
Affective Impact	Reduced Anxiety	Lowered Performance Pressure	"I could express my thoughts without pressure."
	Self-Confidence	Enhanced Learner Confidence	"This technique improved my self confidence."
Feedback& Scaffolding	Multimodal Feedback	AI and Teacher Feedback Synergy	"AI and my lecturer was so helpful."
Learner Autonomy	Learning Monitoring	AI-supported Learning Tracking	"AI kept a record of what I learnt daily."
Productive Skills	Speaking Fluency	Reduced Dependence on Prompts	"I could speak without dependence to a piece of paper."
Language Accuracy	Grammar Development	Improved Grammar Accuracy	"It even improved my grammar skills."
Textual Competence	Cohesion& Coherence	Academic Use of Cohesive Devices	"Now, I use more academic one."
Instructional Design	Cognitive Load	Task Timing Fatigue	"It was tiring to write something at the end of the class."

displays the content analysis results with themes, categories, codes and example quotes.

In accordance with Table 3, it is possible to note down that affective impact theme represents reduced anxiety and lowered performance pressure. This result is in consistent with many studies in the literature which highlight that using technology or AI leads to a decrease in anxiety (Kang and Han, 2015; Lee, 2016; O'Neill and Russell, 2019 among others) along with confidence (Li et al., 2025). In terms of feedback and scaffolding, the students expressed their content about having multimodal feedback, and feedback by AI has already proved to be effective for the development of writing skill (Zhang, 2025). Furthermore, the participants reported their content about the tracking options of them via AI which was also a positive effect on learner autonomy.

Taking productive skills, language accuracy and textual competence into consideration, the participants also pointed out the positive effects of AI about cohesion, grammar development and fluency. This result aligns with studies in the literature demonstrating that AI-assisted feedback supports learners in identifying linguistic errors, refining sentence structure, and improving overall textual organization (Mekheimer, 2025). AI tools were found to be good at reducing cognitive load during the revision process which makes learners focus more effectively on meaning construction and discourse level coherence. Moreover, consistent with the findings of Youn and Salam (2025), AI-generated feedback contributes to the development of writing fluency by enabling learners to revise their texts more autonomously and confidently. The study conducted by Yener and Selçuk (2004) reported that AI-assisted feedback positively affected grammatical development and accuracy which made learners to produce more structurally sound and coherent texts over time (Yener & Selçuk, 2024). From a pedagogical perspective, it is possible to assert the idea that AI-based feedback might work as a complementary support mechanism rather than a replacement for teacher feedback.

## DISCUSSION AND CONCLUSION

Taking the findings of the present case study into consideration, it can be said that AI tools are very important and effective in teaching textual elements for the creation of texts, the messages of which can be transmitted to the addressee as exactly as coded by the addresser. Since the content of the intended linguistic portion can be delivered in the ideal way, the communication breakdowns or misinterpretations of the

given idea can be avoided. Thanks to the nature of the cohesive devices, if used appropriately, the flow of the ideas can be maintained as proposed by Geva (1992) who states "Conjunctions make explicit the logical relations between propositions and signal text structure." A study in a similar vein, Ramasawmy (2004) states that cohesion devices need to be attached importance to create functional relations.

On the one hand, according to the results of the present study, in order to teach those cohesive devices to improve cohesion, AI tools could be used. On the other hand, compared to the AI powered tools, the advantages of using human means are countless. It is undeniable that a human mind is superior to that of AI as for decoding and interpreting a message. First of all, in terms of the rhetorical depth, the involvement of human speakers during a communication brings about the key elements of social awareness. Unlike mechanical means, human commentators use emotional intelligence and background knowledge, determining the addresser's core purpose and the socio-cultural context of the discourse. While the main goal of the AI tools is to ensure grammatical accuracy, the human element focuses on the communicative authenticity in the first place. Secondly, the focus of the AI tools is to ensure grammaticality, yet the human element underlines the importance of meaning and emotional impact. The knowledge that the author or the speaker is a living being introduces the notion of intentionality and situationality. Besides, the fact that the human mind has a holistic interconnection, the new ideas can be linked to the previously mentioned textual elements, thus making the discourse more communicative. Finally, human involvement introduces a moral compass to avoid any mechanical interference into the language, establishing a more natural link between the addresser and the addressee.

In conclusion, it can be said that the most effective way is to seek a hybrid method, in which AI element works as a fast builder, who guarantees the robustness and sturdiness of a building, while human element acts as the aesthetic and creative features as often skipped by AI. In this way, AI can be employed for teaching or checking the mechanical items while a human being could be utilized for a different role to maintain the unparalleled resonance of the human intention. The research revealed that AI tools take their strength from technical precision and instant feedback. On the other hand, a human teacher or interlocutor is indispensable in terms of rhetorical depth analysis. As for the future projections and educational implications, some ethical concerns about the overuse of AI feedback leads to the standard expressions of the self. The role of the teacher could



shift from the mechanical “grammar-checker” to that of a “mentor”, relieved from the workload, therefore, focusing on the more “humane” function of the process. In that sense, the results of the present study shed light onto the possible use of a technological tool to develop coherence and teach cohesive devices.

Ethics committee approval was taken in the 8<sup>th</sup> meeting of Mersin University Educational Sciences Ethical Committee in 26.6.2025 with the decision number 178.

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Idea or Notion (100%)	Dönercan Dönük & Özge Kutlu Demir
Literature Review (100%)	Dönercan Dönük & Özge Kutlu Demir
Method (100%)	Dönercan Dönük & Özge Kutlu Demir
Data Collecting (100%)	Dönercan Dönük & Özge Kutlu Demir
Data Analysis (100%)	Dönercan Dönük & Özge Kutlu Demir
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Discussion and Commentary (100%)	Dönercan Dönük & Özge Kutlu Demir

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