



Role of corpus based online tools in analysis, assessment and teaching academic writing

Nasirdinova Dildoraxon Maxsudaliyevna –

Associate professor, Military security and defense university

E-mail: dildoranasirdinova26@gmail.com

ORCID: <https://orcid.org/0009-0002-4848-8239>

Annotation. This article presents a comparative linguistic analysis of student-written and AI-generated essays composed in English based on identical prompts. Three tools were used for the analysis: LIWC, Versatile/VersaText, and Grammarly. The results revealed differences in linguistic accuracy, lexico-grammatical organization, readability, analytical nature, and cognitive characteristics. AI-generated texts demonstrated higher formal accuracy and a more pronounced analytical style, whereas human-written texts were characterized by a higher number of linguistic errors and a greater degree of authenticity. The study demonstrates that the combined use of multiple tools allows for the identification of distinct linguistic features distinguishing human and AI-generated writing and can be valuable for the analysis, assessment and teaching of academic writing.

Keywords: academic writing, assessment, analysis, online tools, corpus approach, chatbots, linguistic features.

Роль корпусных онлайн-инструментов в анализе, оценивании и обучении академическому письму

Аннотация. В данной статье представлен сравнительный лингвистический анализ эссе, написанных студентами и сгенерированных искусственным интеллектом на английском языке на основе идентичных заданий. Для проведения анализа использовались три инструмента: LIWC, Versatile/VersaText и Grammarly. Результаты исследования выявили различия в лингвистической точности, лексико-грамматической организации, читабельности, аналитическом характере и когнитивных особенностях текстов. Тексты, сгенерированные искусственным интеллектом, продемонстрировали более высокий уровень формальной точности и более выраженный аналитический стиль, тогда как тексты, написанные студентами, характеризовались большим количеством языковых ошибок и более высокой степенью аутентичности. Исследование показывает, что комплексное использование нескольких онлайн-инструментов позволяет выявить характерные лингвистические особенности, отличающие тексты, созданные человеком, от текстов, сгенерированных искусственным интеллектом, и может быть полезным для анализа, оценивания и обучения академическому письму.

Ключевые слова: академическое письмо, оценивание, анализ, онлайн-инструменты, корпусный подход, чат-боты, лингвистические особенности.

Akademik yozuvni tahlil qilish, baholash va o'qitishda korpusga asoslangan onlayn vositalarning o'рни

Annotatsiya. Ushbu maqolada bir xil topshiriqlar asosida ingliz tilida talabalar tomonidan yozilgan va sun'iy intellekt yordamida yaratilgan esselarning qiyosiy lingvistik tahlili amalga oshirilgan. Tahlil jarayonida uchta vositadan LIWC, Versatile/VersaText va Grammarly dasturlaridan foydalanilgan. Tadqiqot natijalarida lingvistik aniqlik, leksik-grammatik tuzilish, matnning o'qish uchun qulayligi, tahliliy xususiyati hamda kognitiv ko'rsatkichlari bo'yicha muayyan farqlar aniqlangan. Sun'iy intellekt tomonidan yaratilgan matnlar yuqori darajadagi formal aniqlik va aniqroq ifodalangan tahliliy uslub bilan ajralib turgan bo'lsa, talabalar tomonidan yozilgan matnlarda lingvistik xatolar soni ko'proq bo'lishiga qaramay, ular da autentiklik darajasi yuqoriroq ekanligi kuzatilgan. Tadqiqot bir nechta onlayn vositalardan kompleks foydalanish inson va sun'iy intellekt tomonidan yaratilgan yozma matnlarni farqlovchi o'ziga xos lingvistik xususiyatlarni aniqlash imkonini berishini hamda akademik yozuvni tahlil qilish, baholash va o'qitishda samarali bo'lishi mumkinligini ko'rsatadi.

Kalit so'zlar: akademik yozuv, baholash, tahlil, onlayn vositalar, korpus yondashuvi, chatbotlar, lingvistik xususiyatlar.

KIRISH

Corpus linguistics provides a methodological framework for the systematic study of linguistic patterns based on large or specially curated text collections. Unlike traditional qualitative analysis, the corpus approach allows the researcher to quantitatively compare the frequency of lexical, grammatical, syntactic, and discourse features in different types of texts. Biber (1988), for example, demonstrated the feasibility of using computerized analysis to identify multidimensional differences between different registers of the English language. This approach is particularly relevant for the study of AI-generated writing, since texts created by humans and artificial intelligence can be compared across a whole set of measurable linguistic parameters. In modern applied linguistics, corpus analysis is also used to study the written language of learners of English as a foreign language (EFL). McEnery and Hardie consider corpus linguistics as a method for identifying patterns of language use through the systematic analysis of authentic text data. This approach allows us to consider student essays and AI-generated text essays as two comparable corpora and, analyzes them not only in terms of overall linguistic correctness, but also in terms of lexical diversity, syntactic organization, readability, functional words, cognitive and discursive characteristics. Later studies confirmed that differences between AI-generated and human-written texts can manifest themselves on several levels at once. Berber Sardinha (2024) applied multivariate analysis to compare AI-generated and human-authored texts and found significant differences in the language profiles of the two types of texts.

This problem is particularly significant in teaching English as a foreign language. For EFL students, written assignments traditionally allow teachers to assess not only grammatical accuracy but also the student's ability to independently express ideas, organize arguments, use academic vocabulary, and create coherent text. The advent of generative AI complicates this assessment, as modern language models are capable of producing texts that meet the formal requirements of the academic genre.

METHODS

In this study AP English language composition essays written by cadets and ChatGPT were selected to analyze, assess and compare. Both cadets and AI Chabot were given the same instructions and the works were collected for discourse analysis since AI- generated and student-written Texts can vary in lexical diversity, syntactic complexity, academic vocabulary, readability, discourse markers, cognitive and social characteristics, and the number of superficial errors. However, no single indicator can be considered a reliable and universal marker of AI authorship. Therefore, multivariate corpus analysis using multiple tools appears to be a more valid approach for studying the differences between human and AI- generated texts. Hence, for this analysis online corpus tools like LIWC, Versatile/VersaText, and Grammarly were used for instant results.

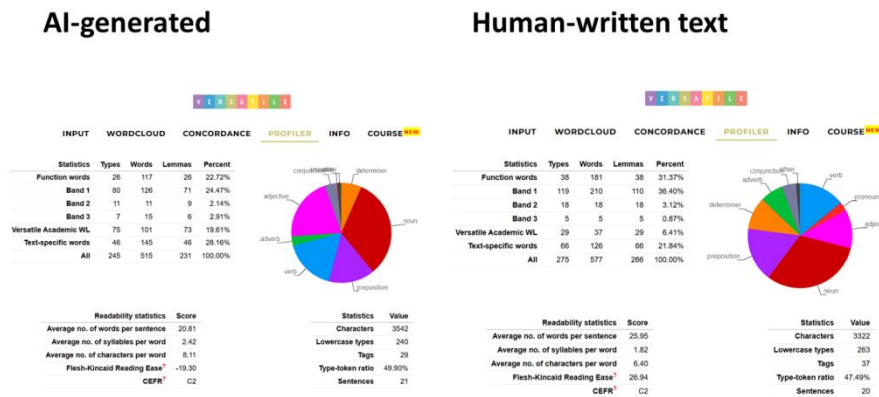


Figure 1

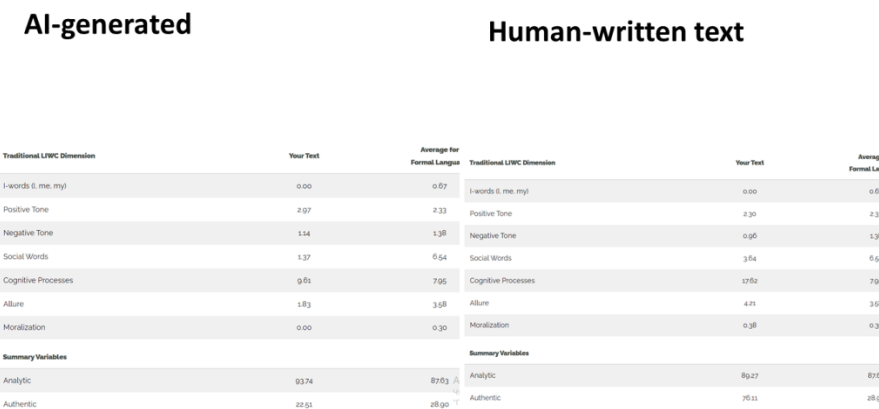


Figure 2

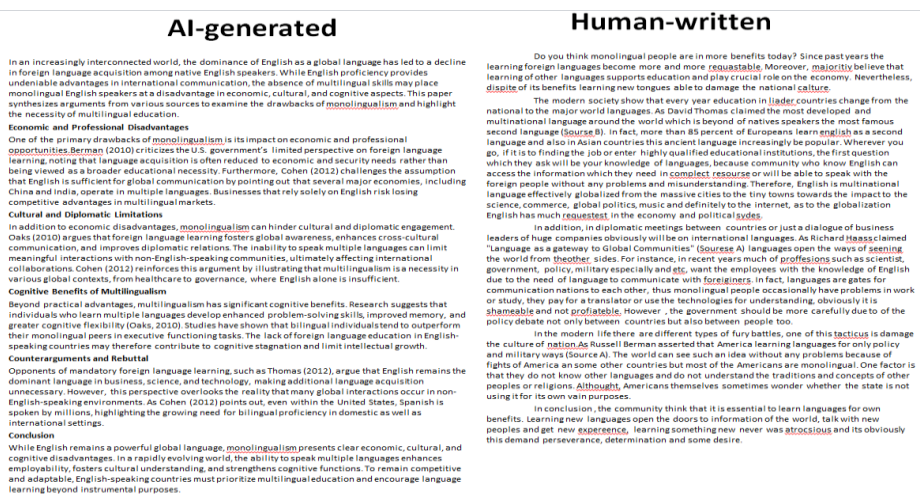


Figure 3

ANALYSIS AND RESULTS

Linguistic Features analysed by Versatile/Versatext show significant differences between AI- generated and human-written texts at the level of lexical and grammatical characteristics. The AI text is shorter: 515 words versus 577 words in the human text-but contains a higher proportion of academic words (19.61% vs. 3.12%) and text-specific words (28.16% vs. 21.84%). This may indicate a tendency for AI to use more formal and academically oriented vocabulary, while human-written essay is characterized by a higher proportion of basic functional and common vocabulary. The difference in syntactic organization is especially noticeable: the average sentence length in the AI text is 20.81 words, while in the human-written text it is 25.95 words; however, the average number of syllables per word is significantly higher in the AI text (2.42 versus 1.82). The Kincaid index also differs significantly with 19.30 for the AI text versus 26.94 for the human-written text, although both texts are automatically classified as C2. Despite the fact that cadets' level is not C2 based on their recent proficiency test results, citing from the delivered sources might influence the overall CEFR level of their essays. Moreover, the type-token ratios are almost comparable (49.90% and 47.49%), indicating a fairly similar level of lexical diversity. Overall, the data suggest that AI text does not necessarily have significantly greater lexical diversity, but it does display more complex and academic vocabulary, whereas human text contains longer sentences and a higher proportion of functional and common words.

Regarding the LIWC, results also demonstrate significant differences between the two text types, primarily in measures related to cognitive processes, social focus, and text authenticity. Human-written essay has a significantly higher Cognitive score Processes than AI generated with 17.62 to 9.61, which may indicate a more active expression of reasoning, explanation, cause-and-effect relationships, and evaluation of ideas. A similar trend is observed in the Social category. Words and Allure show 3.64, 1.37 and 4.21, 1.83 respectively which may indicate a more pronounced personal and social component of human writing. In contrast, AI- generated text shows a slightly higher Positive Tone (2.97, 2.30) and a significantly higher Analytic score (93.74, 89.27), which may correspond to a more structured, formal, and objective-analytical style. The most notable is the authentic score: 76.11 in the human-written text versus 22.51 in the AI- generated text. This is a potentially important difference, as it indicates a more pronounced linguistic authenticity of the human text. However, the I-words score is 0 in both texts, and the negative tone scores are similar (1.14 vs. 0.96). Thus, the LIWC in this comparison shows that the human text is characterized to a greater extent by cognitive, social, and authentic linguistic representation, while the AI text appears more analytical and less personalized. However, these scores should be interpreted as statistical/linguistic characteristics of the text, and not as independent evidence of the text's origin from a person or AI.

Grammarly was used to check mainly accuracy and the third image demonstrates the most obvious difference between the two types of AI- generated texts. The essay is presented as a grammatically and stylistically well-organized text: the sentences have a consistent structure, the vocabulary corresponds to an academic register, and the presented fragment shows virtually no signs of superficial linguistic errors. In human-written essay, on the contrary, Grammarly identifies a large number of potential errors and problem areas, including the use of prepositions, articles, word choice, collocations and grammatical structure: for example, "*in diplomatic meetings, dialogue of business leaders, professions such as scientist, government, policy* ", "*employees*" with the knowledge of English", "*pay for a translator or use the technologies for understanding*", "*obviously it is shameable and not "profietable."*" From an English language teaching perspective, this indicates a significant difference in surface-level accuracy: AI- generated text exhibits a significantly more edited and normative linguistic form, while human-written text retains characteristics of the natural L2 writing process, including grammatical, lexical, and collocation errors. Combined with the Versatile/Versatext result, this suggests that the AI-based text is characterized not only

by more academic vocabulary and a certain structural organization, but also by higher formal linguistic precision. However, it is important not to interpret this result as proof that the AI-based text is *superior* as Grammarly primarily evaluates the formal features of written language, while the presence of errors in a student's text may reflect the actual level of English proficiency and the individual process of developing L2 writing. Furthermore, the presented image shows specific fragments rather than a quantitative accuracy indicator for the entire corpus, so it is more accurate to speak in this article about an observed trend rather than an absolute difference.

CONCLUSION

The results presented for these three tools allow us to formulate the following general conclusion of the study. A comparative analysis shows that student-written and AI-generated essays have different linguistic profiles, and differences are found simultaneously on several levels: formal accuracy, lexical and grammatical organization, readability, cognitive characteristics, and the degree of expression of personal and social components. AI-generated The text in the studied material is characterized by higher formal precision, a more pronounced analytical organization, and a greater representation of academic and specialized vocabulary. The LIWC results, in turn, show differences in the Analytic, Authentic, and Cognitive categories. Processes, Social Words, Allure, and Tone, all human-written text shows significantly higher Authentic and Cognitive scores Processes, while AI-generated text has a higher Analytic score and a slightly more pronounced Positive score Tone. These results suggest that human writing in this study largely reflects individual language production, personal engagement, and meaning-making processes, while AI-generated writing has a more standardized, analytical, and formally verified nature. At the same time, the results show that the differences between the two types of texts are not reduced to a simple “correct and incorrect” or “complex and simple” opposition.

REFERENCES

1. Berber M., Sardinha T. AI-generated vs human-authored texts: A multidimensional comparison // *Applied Corpus Linguistics*. – 2024.
2. Biber D. *Variation across Speech and Writing*. – Cambridge: Cambridge University Press, 1988.
3. Fredrick D.R., Craven L. Lexical diversity, syntactic complexity, and readability: A corpus-based analysis of ChatGPT and L2 student essays // *Frontiers in Education*. – 2025. – Vol. 10.
4. Goulart L., Matte M.L., Mendoza A., Alvarado L., Veloso I. AI or student writing? Analyzing the situational and linguistic characteristics of undergraduate student writing and AI-generated assignments // *Journal of Second Language Writing*. – 2024.
5. Herbold S., Hautli-Janisz A., Heuer U., Kikteva Z., Trautsch A. A large-scale comparison of human-written versus ChatGPT-generated essays *Scientific Reports*. – 2023.
6. McEnery T., Hardie A. *Corpus Linguistics: Method, Theory and Practice*. – Cambridge: Cambridge University Press, 2012.
7. Mizumoto A., Yasuda S., Tamura Y. Identifying ChatGPT-generated texts in EFL students' writing: Through comparative analysis of linguistic fingerprints // *Applied Corpus Linguistics*. – 2024.
8. Pennebaker J.W., Boyd R.L., Jordan K., Blackburn K. *The Development and Psychometric Properties of LIWC2015*. – Austin: University of Texas at Austin, 2015.
9. Zhao N., Lei L. Informality features in AI-generated academic writing: A corpus-based comparison between human and AI // *Journal of English for Academic Purposes*. – 2026.