

UDC 378.091.33-057.87: 811.111
DOI: 10.15587/2519-4984.2026.361730

STUDENTS' CHALLENGES OF WRITING SCIENCE ESSAYS IN ENGLISH FOR SPECIFIC PURPOSES AT TERTIARY LEVEL

Tetiana Pastushenko, Nataliia Lutkovska

Analyzing and summarizing information from different sources, comparing and contrasting ideas, interpreting and presenting results are routine job-related issues stipulating an integrated approach to the development of linguistic and specialism-related competences of majors in Biology used to describe scientific theories and models, discuss and evaluate experimental methods. These tasks are highly correlated with academic writing skills that, to a great extent, can be acquired by constructing academic specialism-related essays.

The objective of this paper is to identify and analyze the difficulties of majors in Biology in science essay writing in English at intermediate level and suggest successful strategies that can be employed to solve the problems arising.

The research was conducted within the framework of an ESP course for junior students. In order to visualize the challenges, 30 undergraduates were involved in writing 3 different types of science essays as a part of their formative assessment. At the next stage of the research, these papers were subjected to qualitative and quantitative analyses.

The complexities experienced by undergraduates are divided into:

- 1) defining the relevant essay type and composing parts of the essay;*
- 2) lingual instruments of arranging ideas. The findings of this research indicate that the appropriate communicative strategy employed by students when identifying the essay type essentially contributes to crafting relevant content. Constructing an effective introduction and ensuring text cohesion, followed by building a successful conclusion and making relevant references to the data and visuals, epitomize the highest level of difficulties in writing science essays in English for Specific Purposes*

Keywords: *science (specialism-related) essays, students of independent user level (B1-B2), essay structure, essay types, text organization, cohesion, coherence, language register*

How to cite:

Pastushenko, T., Lutkovska, N. (2026). Students' challenges of writing science essays in English for Specific Purposes at tertiary level. ScienceRise: Pedagogical Education, 2 (67), 24–28. <http://doi.org/10.15587/2519-4984.2026.361730>

© The Author(s) 2026

This is an open access article under the Creative Commons CC BY license

1. Introduction

The National Curriculum for Universities “English for Specific Purposes” (2005) and universities’ ESP syllabuses are designed to help non-linguistics students form professional communicative competence for academic and specialism-related areas. Professional communicative competence in Academic Writing, which is one of the basic language skills, develops with the performance of job-related tasks (reports, research projects, articles, and other academic genre-based assignments). These tasks enable students to synthesize and summarize information from different sources, make an outline and arrange ideas in a logical sequence, write an introduction/conclusion, organize paragraphs, use conjunctions and sentence connectors for linking ideas, compare, contrast, and interpret information from tables, charts and diagrams, organize and present data in a variety of visuals, make in-text references and quote correctly, construct bibliographies, proofread their work, and, finally, record and present research findings. Most of these academic skills are generally acquired by writing academic specialism-related essays. If organized in a consistent manner, ESP essays, along with developing language proficiency, can be a powerful research

tool for acquiring subject-related knowledge in a particular area of specialism.

2. Literature review

Organizational principles of academic essay writing at different language proficiency levels are covered by a number of guidebooks. In addition to the conceptual knowledge, the researchers provide practical guidance leading students through all stages of writing. While describing the process, Butler highlights the fundamentals of sentence structure, paragraph organization, grammar and vocabulary at elementary level [1]. Blanchard & Root focus on various techniques of organizing ideas and building structural skills in different types of essays at intermediate level [2].

Recent research on various aspects of essay writing testifies to its significance worldwide. Austrus et al. identified specific challenges of non-native speakers in Malay essay writing at primary level: weak writing skills, poor performance levels, a lack of interest in writing, inadequate language proficiency, limited vocabulary, and ineffective idea processing [3]. Halytska offered assessment criteria for measuring the development of commu-

nicative competence in academic essay writing in German [4]. In terms of academic essay-writing challenges, the most common research foci have covered issues ranging from the full spectrum of students' errors on multiple strata of cognition [5] to more specific areas of concern, such as the use of non-academic vocabulary [6] or a failure to provide coherence [7]. Bulqiyah et al. categorized the students' difficulties into affective problems arising from students' and lecturers' attitude in the course, cognitive problems associated with the process of writing, and linguistic problems [8]. Febriani investigated internal factors (psychological and linguistic) and external factors (peer and advisor support) resulting in students' challenges in writing [9]. Haq et al. highlighted the effects of the formative assessment in the development of students' writing skills [10].

Although concerned with the problem areas of writing essays at tertiary level, the above-mentioned papers mostly explore the difficulties encountered by students with a major in Linguistics and/ or Education. Taking into consideration the specificity of science essays (the subjects to be covered, the use of terminology and extended format), it could be hypothesized that somewhat different challenges are experienced in writing by non-linguistics students. Examining the complexities facing science students in writing academic essays within the framework of an ESP course is the focal point for this paper.

3. Aim and tasks of the study

The purpose of the article is to investigate the challenges of majors in Life Sciences by analyzing their typical mistakes in science essay writing.

To achieve the goal, the following tasks were set:

1) to assess the impact of the communicative strategy in classifying academic essay types on students' ability to understand the purpose of an essay from the instructions given on a selection of topics within the framework of an ESP course;

2) based on the analysis of 3 different types of essays on specialism-related topics, written and submitted by each participant, to identify major and minor difficulties junior students with a major in Life Sciences encounter when writing extended science essays in English as their second language;

3) to provide practical guidance aimed at enhancing intermediate students' skills in writing science essays in English for Specific Purposes.

4. Materials and methods

The study is based on the theoretical and experimental analysis of writing essays at tertiary level.

Initially, thirty-eight junior students seeking a Bachelor degree in Life Sciences at Taras Shevchenko National University of Kyiv (Kyiv, Ukraine) were invited to participate in the study, which was conducted in the 2025–2026 academic year. The participants were fairly homogeneous in age, which ranged from 19 to 21, all spoke Ukrainian as their first language, and were starting their third year of a four-year Bachelor program in Biology with a B1–B2 level in English as their second language. Later, the results of students who submitted two essays instead of three, required in the course of studying, were discarded in order to make the research valid. Thus, the

number of participants whose data were finally analyzed reduced to 30 students (6 males and 24 females).

The sample was collected following the participants' informed consent for their essays to be used in a research experiment, with any excerpts of the texts produced being presented in the published results anonymously and revealing no student's identity.

In order to get a complete picture of students' problem areas, 30 juniors were requested to compose 3 different types of essays on specialism-related topics they had studied: "Pros and Cons of Antibiotics", "Hormones Dictate Our Behaviour More than We Realize" and "The Use of Traditional, Recombinant and mRNA Vaccines against Infectious Diseases." At the next stage of our research, these papers were subjected to qualitative and quantitative analyses as a part of students' formative assessment during an ESP course. Dynamics in students' writing skills formation were also assessed, based on which practical recommendations were developed to address students' specific challenges.

5. Research results and their discussion

Common problem areas of non-native speakers in writing essays at tertiary level are associated with weak writing skills, poor performance level, a lack of linguistic competence, and difficulties in constructing paragraphs and essay formats [11]. From our experience with ESP intermediate level students, these complexities broadly fall into the following categories: the general framework of the essay, language, and arranging ideas. While the former is related to the type and structural parts of an essay, the latter is normally associated with cohesion, coherence, and register.

Different approaches are used by educators to identify essay types. Predominantly, essays are divided into: cause-and-effect (analyzing reasons and results), comparison-and-contrast (emphasizing similarities and differences), problem-solution (discussing solutions to the problem), and opinion essays (expressing personal views on the problem) [12]. In contrast, this study adopted an alternative classification, which is likely to be more appropriate for the purposes of writing science essays within the ESP course. According to Hewings, essays are organized into three main types: describe, discuss and defend [13]. "Describe" essays are used to provide a description of a topic or its individual aspects; "discuss" essays are used to present arguments for two or more alternative positions on a single issue, to evaluate them, and choose the strongest one to support; "defend" essays serve the purpose of taking a stance on a particular position (given in the topic) by either supporting or challenging it. This action-oriented instruction in the form of a verb imperative (describe/ discuss/ defend) seems to be a more effective communicative strategy for focusing students' attention on the purpose of an essay than approaches based on a more abstract, descriptive nature of nouns (e.g. opinion essay) or adjectives (e.g. argumentative essay). Moreover, science students are often given assignments to describe scientific theories and models, discuss and evaluate experimental methods, and provide experimental evidence on a specific subject. These extended essays, unlike a typical five-paragraph essay in General English, imply integration, based on a com-

bination of cause-and-effect, comparison-and-contrast, and problem-solution categories within the frame of a single paper.

As a part of their ESP course, when nearing completion of the thematic unit studied, junior students were required to write 3 different types of essays: discuss (“Pros and Cons of Antibiotics”), defend (“Hormones Dictate Our Behaviour More than We Realize”), and describe (“The Use of Traditional, Recombinant and mRNA Vaccines against Infectious Diseases”). Notably, sufficient class practice in discussing, evaluating, and choosing strategies for particular essays greatly enhanced juniors and seniors’ ability to define the type of essay implied by the essay question, thus facilitating their advancing stronger arguments and building the general content of the essay. The findings of this study showed that out of 30 junior students who were required to compose each of the 3 different types of science essays (which totals 90 papers) only 4 people (13.3%) had problems with relevance to the topic when constructing the 1st essay and 2 people (6.7%) when building the 3rd one. Since the criterion of relevance to the topic is determined as primary for assessing a piece of writing by a number of educators [14], it is reasonable to assume that the describe/ discuss/ defend strategy can be successfully employed by intermediate level ESP students to produce relevant academic essays.

However, defining the type of an essay is just the starting point for the process of writing. Another group of structural challenges encountered by non-native students in writing academic essays in English refers to the way the text is constructed. As a piece of writing, any essay type generally comprises 3 basic structural elements: an introduction, a body, and a conclusion [15].

The introduction is the opening paragraph of an essay. Unlike other paragraphs that start with the topic sentence, the main idea here (referred to as the thesis statement) is generally presented in the last sentence. The purpose of the introduction is to give a general background on the issue and map out the aspects or arguments to later develop in the body paragraphs. Our earlier research [16] suggests that despite the majority of the students being competent in rephrasing the essay topic and making generalizations, many learners fail to summarize the ideas, which are put forward and discussed in greater detail in the following paragraphs. The resulting text of the essay therefore lacks in logical binding and consistency, revealing poor preparation and planning. To remedy this structural flaw, after their papers had been checked and analyzed, these students were recommended to add the focal points summarizing the topic sentences, which open the body paragraphs to the introductory paragraph of the essay. Even though the results of this study indicate that a significant number of juniors faced the problem of creating the right introduction format, dynamics of their essay writing skills development were quite positive: in the course of studying, the number of papers with an irrelevant introduction reduced from 18 pieces of writing (60%) for the 1st essay to 6 pieces of writing (20%) for the 3rd one.

The body is the central part of an essay divided into paragraphs. As technically any essay is a group of paragraphs about a specific subject, it could be assumed

that writing an essay is not much harder than building a paragraph. However, the mechanics of writing is not always as simple as a theoretical framework might suggest. According to this research, 7 students (23.3%) encountered the challenge of developing essay bodies when writing the 1st essay and only 1 student (3.3%) when composing the 3rd one. Although tertiary level students are generally well aware of structural elements constituting a paragraph (the topic sentence followed by supporting sentences), the number of sentences with supporting evidence may differ from paragraph to paragraph depending on the scope of students’ knowledge of the subject or their resourcefulness. For instance, some students would construct excessively lengthy paragraphs expanding on the aspects of the topic they were most knowledgeable about. The opposite extreme observed in the body of the essays was short superficial paragraphs briefly reviewing the subtopics that students did not feel confident about. Consequently, the bodies of these papers looked unbalanced, with some paragraphs being plethoric or, vice versa, underdeveloped. A standard recommendation for such students was to conduct an additional search on the Internet in order to develop a well-balanced information and source background, which would potentially prevent them from building excessively short or long paragraphs.

The conclusion as a distinct structural element of an essay was also found to present a certain challenge to ESP students. The general requirement for the conclusion is to recapitulate the aspects described or the standpoints presented in the preceding paragraphs. In fact, it is a summary of basic ideas contained in the body paragraphs. Our results, however, showed that many students considered a summary of the ideas already presented in the body of their essay as a repetition or a redundant element in the conclusion, which might be due to a different approach to writing essays in their native language developed in their earlier high school essay writing practice. Extrapolating from the students’ past experience of arriving at a more general conclusion to the brevity of their higher school science essay, in fact, resulted in a lack of conceptual unity and structural symmetry. The research data of this study demonstrate that the number of papers in which students failed to build an appropriate conclusion made up 16.7% (5 students) for the 1st essay and 6.7% (2 students) for the 3rd one. The feedback concerning a superficial conclusion paragraph was expanding it into a fully-fledged overview of the discussed standpoints and/or reinforcing the writer’s stance.

A large group of science essay writing challenges can fall under the umbrella category of organizing information. An important instrument in achieving clarity in writing is the utilization of the means of cohesion and coherence [17]. Cohesion employs a variety of lexical and grammatical text elements. The spectrum of lexical means of cohesion covers a wide array of units, including numerous content words, their synonyms and classifying nouns used consistently throughout the text. For instance, the pool of words on the topic “Hormones Dictate Our Behaviour More Than We Realize” could include the lexical items as follows: hormones, chemical messages, biological mechanisms, as well as the names of particular hormones (insulin, estrogen, corti-

sol, oxytocin etc.). Major types of structural elements most widely used in writing science essays to build text cohesion include:

- 1) reference words (e. g. possessive, demonstrative and personal pronoun references instead of nouns, definite articles);
- 2) substitutes (e. g. auxiliary and pronoun substitutes);
- 3) tense agreement of the verbs;
- 4) a number of linking words;
- 5) ellipsis.

Grammatical cohesion devices below B2 level (such as pronoun substitutes and tense agreement) do not normally cause problems for junior essay writers, while conjunction *sensu lato* is at this level beyond the scope of their linguistic competence. Linking signals showing logical relationships between ideas are defined by some researchers as “transitions”, including “smoothers”, “contradictors”, and “explainers” [18]. At the intermediate level, students usually recognize a rather wide range of conjunctions and sentence connectors when reading academic texts, but tend to resort to a limited number of linkers when writing essays. As can be seen from the results of analyzing students’ papers, some students are not very inventive at linking ideas within and between paragraphs. In their papers, grammatical cohesion is managed only to some extent by using a narrow range of conjunctions, such as ‘that’, ‘and’, ‘but’, ‘as well’ repeatedly instead of offering a variety of connectors. According to this research, 40% of papers included no relevant transition signals in the 1st essay and, correspondingly, 13.3% of papers lacked those in the 3rd essay. The students who failed to use transition signals properly were trained to restate their ideas applying a wider variety of grammatical cohesion means indicating a plethora of relationships (addition, contrast, similarity, concession, exemplification, purpose, cause/reason, effect/result, comparison, manner, etc.).

Excessive use of connectors (more than 12 per page) is, however, likely to produce the reverse effect of hindering readers’ comprehension rather than helping them to follow the writer’s logic. Coherence (the internal logic of a text) serves the purpose of aiding in establishing and recognizing the semantic links, i.e. clarifying the writer’s purpose and rationale. This study showed that only in the case of 2 people (6.7%) submitting the 1st essay the text proved to be coherent. A strategy to help students cope with optimal connector use, as this study suggests, could be encouraging a wide use of linking words in the earlier drafts, but removing unnecessary ones from the latest draft after thorough checking.

Register is still another complexity that needs to be pointed up. It involves the choice of topic vocabulary suitable for the paper and the aspect of formality/informality. A majority of intermediate level students realize that compliance of science essays with the formal writing style criteria implies the formal tone and the use of formal lexical items. Typical errors, however, include contractions and short forms of words (e.g. “It’s...”; “It’s been...”; “in the lab”).

Describing charts, diagrams and tables makes an integral part of science essays; therefore, students should be equipped with an array of academic clichés, such as

“as shown in Table 4”, “as can be seen in the diagram”, “as illustrated by Fig. 2”, etc. As they have no experience in making reference to figures and tables in English, juniors need to undergo some preliminary training before they are expected to produce and describe numerical data and visuals in their extended essays.

Since the choice of visuals to present different types of data (e. g. showing trends, proportions, correlation) refers to advanced academic skills, one limitation of this research might concern the issue of students’ general scientific competence, including understanding and effective use of different types of visuals. The latter requires gathering additional data and further analysis.

Another obvious limitation of this study is current lack of instruments to identify or assess students’ potential use of modern AI platforms in the process of writing. As writing a science essay requires reviewing a number of sources on the topic and gathering sufficient evidence, students were given access to Internet resources. At the same time, the participants were strongly discouraged from using automatic text-generating instruments. However, the results might have been different, especially in terms of the vocabulary used, if all the essays had been written in class, with no access to the Internet. To improve the reliability of results, further research might focus on extended science essays written without students’ access to online resources, but using scientific evidence provided by the teacher offline.

The findings of this paper may be of practical value for teachers of ESP and academic writing. When addressed in similar contexts, difficulties in science essay writing commonly experienced by intermediate students could be successfully predicted, efficiently remedied, or even prevented to a certain extent, thereby enhancing students’ academic skills and performance.

6. Conclusions

1. Our research results suggest that the describe/ discuss/ defend strategy in classifying science essays, combined with sufficient class practice, has a positive effect on students’ ability to correlate the topic with an optimal communicative approach and develop an appropriate writing strategy.

2. This study revealed that when writing science essays, intermediate level students generally encounter the following categories of challenges: the overall structure of the essay, organizing information in a coherent text, and language register.

The highest level of complexity is manifested in building an essay introduction and providing text cohesion. A large proportion of junior students (60%) were found to have difficulty with making an effective summary of the main ideas in the introduction at the initial stage of the experiment, with this number decreasing to 20% for the third essay in the series of assignments. Among the students’ first-trial essays, 40% lacked coherence, while their third essays showed a significant drop in a lack of coherence (13.3%).

Other noticeable challenges revealed in our study include constructing a body (with the initial unbalanced-paragraph issue of 23.3% gradually reducing to 3.3%), writing an effective conclusion (with the proportion of superficial conclusion paragraphs decreasing from 16.7%

to only 6.7%) and giving reference to charts, diagrams, graphs, and tables.

3. To successfully develop tertiary level students' writing skills, a variety of approaches could be employed, such as scaffolding, providing students with model essays and writing samples, offering individual feedback, discussing pieces of writing, using different marking scales, explaining marking criteria, and organizing remedial teaching.

Conflict of interests

The authors declare that they have no conflict of interest regarding this study, including financial, personal, authorship or other nature, which could affect the research and its results presented in this article.

Funding

The study was performed without financial support.

Data availability

Manuscript has no associated data.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the current work.

Authors' contribution.

Tetiana Pastushenko: Data analysis, Conceptualization, Methodology, Data validation, Writing – reviewing, editing; **Nataliia Lutkovska:** Data collection, Data analysis, Conceptualization, Methodology, Writing – reviewing.

References

- Butler, L. (2007). *Fundamentals of Academic Writing*. New York: Pearson Education, 227.
- Blanchard, K., Root, C. (2010). *Ready to write More: From paragraph to essay*. New York: Pearson Education, 200.
- Austrus, E., Mahamod, Z., Adnan, N. H. (2025). Challenges in Malay essay writing: a qualitative study among non-native speakers in primary school. *Journal of Education and Learning (EduLearn)*, 19 (3), 1525–1532. <https://doi.org/10.11591/edulearn.v19i3.22503>
- Halytska, O. (2024). Experience in conducting the academic essay competition. *Studia Methodologica*, 57, 259–269. <https://doi.org/10.32782/2307-1222.2024-57-27>
- Rachmawati, D. L., Fadhilawati, D. (2024). Exploring the Challenges Faced by ESP Students in Writing Academic Essay. *JETLEE: Journal of English Language Teaching, Linguistics, and Literature*, 4 (2), 190–206. <https://doi.org/10.47766/jetlee.v4i2.2962>
- Akib, R., Tahang, H., Astuti, R., Saral, D. S. (2026). Non-Academic Vocabulary Used by Students in Essay Writing. *JO-LIES: Journal of Linguistic and English Studies*, 3 (1), 15–22. <https://doi.org/10.33506/jole.v3i1.5551>
- Cekiso, M., Tshotsho, B., Somniso, M. (2016). Exploring First-Year University Students' Challenges with Coherence Writing Strategies in Essay Writing in a South African University. *International Journal of Educational Sciences*, 12 (3), 241–246. <https://doi.org/10.1080/09751122.2016.11890431>
- Bulqiyah, S., Mahbub, Moh. A., Nugraheni, D. A. (2021). Investigating writing difficulties in essay writing: Tertiary students' perspectives. *English Language Teaching Educational Journal*, 4 (1), 61. <https://doi.org/10.12928/eltej.v4i1.2371>
- Febriani, T. N. (2022). "Writing is challenging": factors contributing to undergraduate students' difficulties in writing English essays. *Erudita: Journal of English Language Teaching*, 2 (1), 83–93. <https://doi.org/10.28918/erudita.v2i1.5441>
- Nisar Ul Haq, M., Mahmood, M., Awan, K. (2020). Assistance of Formative Assessment in the Improvement of English Writing Skills at Intermediate Level. *Global Language Review*, V (III), 34–41. [https://doi.org/10.31703/glr.2020\(v-iii\).04](https://doi.org/10.31703/glr.2020(v-iii).04)
- Hasnawati, H., Mujahidin, E., Tanjung, H. (2023). Analyzing Students' Difficulties in Writing English Essay. *International Journal of Social Science and Human Research*, 6 (10), 5954–5959. <https://doi.org/10.47191/ijsshr/v6-i10-22>
- Caulfield, J. (2023). How to Structure an Essay | Tips & Templates. Scribbr. Available at: <https://www.scribbr.com/academic-essay/essay-structure/>
- Hewings, M. (2012). *Cambridge Academic English. Upper Intermediate*. Cambridge: Cambridge University Press, 176.
- Kochubei, V. (2021). Challenges of writing academic essays and ways of overcoming them. *Germanic Philology Journal of Yuriy Fedkovych Chernivtsi National University*, 831-832, 147–156. <https://doi.org/10.31861/gph2021.831-832.147-156>
- Sitorus, N., Siregar, E. F. Y., Siagian, B. A., Lestari, F. D., Silitonga, H. (2021). Investigating and examining the structure and the difficulties of tertiary learners in essay writing. *Linguistics and Culture Review*, 5 (S3), 1704–1713. <https://doi.org/10.21744/lingcure.v5ns3.1953>
- Pastushenko, T., Lutkovska, N., Voytovych, S. (2026). Typical students' errors in writing academic essays in english. *Grail of Science*, (62), 1248–1250. <https://doi.org/10.36074/grail-of-science.20.02.2026.146>
- Harmer, J. (2008). *How to Teach Writing*. Harlow: Pearson Education, 153.
- Young, P. (2006). *Writing and Presenting in English: the Rosetta Stone of Science*. Amsterdam: Elsevier, 116.

Received 15.04.2026

Received in revised form 12.05.2026

Accepted 21.05.2026

Published 29.05.2026

Tetiana Pastushenko, Candidate of Philological Sciences, Associate Professor, Head of Department, Foreign Languages Department for Natural Science Faculties, Educational and Scientific Institute of Philology, Taras Shevchenko National University of Kyiv, Volodymyrska str., 60, Kyiv, Ukraine, 01033

ORCID: <https://orcid.org/0000-0001-9826-5004>

Nataliia Lutkovska*, Assistant, Foreign Languages Department for Natural Science Faculties, Educational and Scientific Institute of Philology, Taras Shevchenko National University of Kyiv, Volodymyrska str., 60, Kyiv, Ukraine, 01033

ORCID: <https://orcid.org/0000-0002-1398-9554>

*Corresponding author: Lutkovska Nataliia, e-mail: l.natalia.ska@gmail.com