

USING GENERATIVE ARTIFICIAL INTELLIGENCE (GENAI) TO DEVELOP ACADEMIC WRITING SKILLS IN TECHNICAL STUDENTS

Vinnitsia National Technical University

Abstract

This article examines how generative AI (ChatGPT, Gemini, Claude, Grok) can support English academic writing in technical students in wartime Ukraine. Rather than outsourcing authorship, students use GenAI for brainstorming, genre-aware editing, and grammar and style checking within a transparent workflow: human draft – AI review – human revision. Revision logs and terminology audits strengthen clarity, coherence, and disciplinary accuracy while reducing incentives for cheating. The paper also outlines data-minimisation practices for sensitive contexts.

Key words: generative artificial intelligence, academic writing, English for Specific Purposes, technical documentation, academic integrity.

Анотація

Ця стаття аналізує, як генеративний штучний інтелект (ChatGPT, Gemini, Claude, Grok) може підтримувати академічне письмо англійською мовою у студентів технічних спеціальностей в умовах воєнного стану в Україні. Замість передавання авторства інструменту, студенти використовують GenAI для мозкового штурму, жанрово орієнтованого редагування, а також перевірки граматики й стилю в межах прозорого робочого циклу: чернетка людини – AI-рецензія – доопрацювання людиною. Журнали правок і аудити термінології підвищують ясність, зв'язність і дисциплінарну точність тексту, одночасно зменшуючи стимули до списування. У статті також окреслено практики мінімізації даних для чутливих контекстів.

Ключові слова: генеративний штучний інтелект, академічне письмо, англійська мова для спеціальних цілей, технічна документація, академічна доброчесність.

The russian-Ukrainian war of aggression has reshaped the everyday conditions of teaching and learning in Ukrainian technical universities. Academic work is frequently interrupted by air-raid alerts, power instability, fragmented timetables, and psychological fatigue. In such circumstances, the development of academic writing in English becomes both more difficult and more essential: future engineers must be able to document designs, justify decisions, report risks, and communicate clearly with international partners. This thesis argues that generative artificial intelligence (GenAI) tools (ChatGPT, Gemini, Grok, Claude) can be integrated into English for Specific Purposes and academic literacy courses as resilience-oriented writing support – not as a shortcut to bypass learning, but as a structured scaffold for drafting, revising, and editing technical texts.

Recent empirical work has begun to map how students perceive and appropriate GenAI writing assistants, showing both perceived productivity gains and persistent worries about reliability and dependency, which is directly relevant when technical undergraduates in Ukraine draft lab reports and design documentation under blackout-driven time compression [1, 2]. Within language assessment and academic writing evaluation, controlled comparisons of ChatGPT-based scoring or feedback with human raters highlight where LLM outputs align with rubric-based judgements and where they drift, implying that GenAI should be positioned as a first-pass editor that students must audit against task specifications and disciplinary conventions [3, 4].

Studies that examine [5, 6, 7] interaction patterns and pedagogy-oriented integration stress that learning gains depend on prompt literacy, iterative revision cycles, and explicit modelling of genre moves rather than on one-shot rewriting, which parallels wartime resilience practices where teams rely on checklists, redundancy, and peer review to prevent single-point failure. At the governance level, systematic syntheses converge on a shift from prohibition to accountable use, recommending transparent disclosure, assessment redesign, and integrity-by-design workflows that distinguish legitimate editing and brainstorming from ghostwriting [8]. However, despite emerging field-level framing in second language writing scholarship, there remains an underexplored problem space at the intersection of GenAI-assisted revision and technically constrained genres (requirements, incident reports, safety instructions) in disrupted learning environments, so this study targets [9, 10] how Ukrainian technical students can use ChatGPT-like tools to generate alternatives, tighten cohesion, and verify grammar and style while maintaining evidential accountability and traceable authorship.

The key pedagogical shift [11] is to treat GenAI as an editor and tutor rather than an author. In engineering practice, tools are acceptable when they strengthen quality assurance: a spellchecker does not replace competence, and a simulator does not replace understanding, but both help reduce avoidable errors and reveal weak points. Similarly, GenAI can support writing as a diagnostic instrument that flags unclear phrasing, inconsistent terminology, weak cohesion, and grammatical patterns that obscure meaning. Used correctly, it helps students see writing as an iterative engineering process: define requirements (purpose, audience, constraints), produce a draft, run checks, evaluate output critically, revise, and document the rationale for changes. In wartime conditions, this workflow functions like an uninterruptible power supply for learning – it does not generate the project, but it helps the student return to the task quickly and systematically after disruption.

Table 1. GenAI-supported academic writing as a quality assurance and resilience workflow

Core idea	Engineering analogy	How GenAI is used (non-cheating)	Expected learning effect
GenAI as editor and tutor, not author	Tools are valid when they strengthen QA	Editing drafts, suggesting improvements, explaining errors	Preserved authorship with higher text quality
QA mindset in writing	Spellchecker and simulator support, not replace competence	Grammar and style checks; testing clarity and readability	Fewer avoidable mistakes; clearer communication
GenAI as diagnostic instrument	Fault detection before release	Flagging unclear phrasing, inconsistent terminology, weak cohesion, error patterns	Better coherence and terminological accuracy
Writing as iterative engineering process	Requirements – build – test – refine	Define purpose/audience/constraints; draft; run checks; critically evaluate; revise; document rationale	Stronger revision skills and accountability
Resilience under wartime disruption	Uninterruptible power supply for learning	Structured workflow that supports fast re-entry after interruptions	Continuity of learning; systematic recovery after alerts/blackouts

Source: created by authors.

A practical implementation is an integrity-first “human draft – AI review – human revision” protocol. Students begin with their own content: data, arguments, calculations, and technical decisions must originate from the student and be traceable to course materials, experiments, or credible sources. The AI stage is limited to specific operations: brainstorming options (without final text production), language polishing, tone calibration, and structured feedback. Effective prompts explicitly constrain the tool, for example: “Act as a copy-editor for British English. Do not add new facts. Identify unclear sentences, grammar errors, and register issues. Provide alternatives and explain why.” For technical documentation, GenAI is particularly useful for checking consistency of key terms (for example, whether “*load*”, “*stress*”, and “*strain*” are used correctly across a report), improving sentence-level precision, and aligning sections with conventional genres (abstract, methods, results, limitations). Another high-value use is “reader simulation”: the model can be asked to list what a reader might misunderstand, which mirrors usability testing in software engineering.

To prevent cheating and protect academic integrity, the course design must make process visible. Students submit a short revision log describing which issues the AI highlighted, which changes [12] were accepted or rejected, and why. They are assessed not only on final text quality but also on revision decisions, terminology management, and evidence of critical control over language. This approach aligns with the reality that GenAI output is probabilistic and may be confidently wrong: therefore, verification becomes a learning objective. Students are taught to treat AI suggestions as hypotheses, to cross-check terminology in standards, manuals, and peer-reviewed sources, and to preserve disciplinary meaning over stylistic smoothness. In this model, the ethical boundary is clear: AI may help improve expression, but it must not invent results, references, or claims.

Table 2. Integrity-first “human draft - AI review - human revision” protocol for GenAI-supported academic writing

Protocol element	Student responsibility (authorship)	Allowed GenAI operations	Integrity controls and assessment evidence
Human draft	Produce original data, arguments, calculations, and technical decisions; ensure traceability to coursework, experiments, and credible sources	None at this stage	Draft is the baseline for authorship; traceability is checked
AI review (bounded use)	Provide the draft and define constraints for the tool	Brainstorming options without producing final text; language polishing; tone calibration; structured feedback	Prompts must prohibit new facts; outputs treated as suggestions, not authoritative content
Prompt discipline	Specify audience, genre, and British English register	Copy-editing focused on clarity, grammar, and register; alternative phrasings with explanations	Prompt text evidences intent (editing, not ghostwriting)
Terminology consistency check	Maintain correct disciplinary meaning and term usage	Detect inconsistent usage of key terms (e.g., load, stress, strain) across sections	Terminology audit: student confirms terms against standards/manuals/peer-reviewed sources
Genre alignment	Ensure structure matches technical and academic conventions	Aligning sections to genre expectations (abstract, methods, results, limitations)	Rubric-based evaluation of genre moves and internal coherence
Reader simulation	Anticipate user/reader misunderstandings and revise accordingly	List potential points of confusion for a reader (usability-testing analogue)	Student documents how feedback informed revisions and whether it was accepted or rejected
Human revision	Decide what to accept, modify, or reject; implement changes	None (editing is applied by the student)	Revision log records AI-flagged issues, decisions, and rationales
Verification as learning objective	Cross-check AI suggestions; protect meaning over stylistic smoothness	None (verification is human-led)	Evidence of verification: citations, standards references, corrected technical meanings
Ethical boundary	Preserve accountability for claims and sources	No invention of results, references, data, or claims	Academic integrity policy: AI improves expression only; sanctions if fabricated content appears

Source: created by authors.

Data security is a separate wartime-sensitive constraint. Technical documentation in Ukraine can involve infrastructure, security procedures, or institutional data that must not be exposed. Therefore, students should be trained to anonymise inputs, avoid uploading confidential details, and use minimal excerpts when requesting language feedback. Where possible, institutions should prefer [13] controlled environments or approved accounts, but even without them, risk-aware prompting and redaction practices can be taught as part of professional communication culture.

The expected outcome of this thesis is not the normalisation of AI-written assignments, but the formation of AI-assisted writing competence: the ability to draft independently, to use GenAI for targeted editing and brainstorming, and to justify revisions in accountable academic English. In the context of modern Ukraine, such competence supports continuity of learning under disruption and prepares technical students to communicate responsibly in international settings where clarity, traceability, and integrity are non-negotiable.

This competence also develops students' prompt literacy as a professional micro-skill, enabling them to formulate precise editing requests and to interpret feedback critically rather than passively accepting fluent suggestions. It encourages metalinguistic awareness, because learners must name and correct recurring problems (for example, hedging, cohesion, paragraph logic, and discipline-specific collocations) and then track their improvement across drafts. In technical domains, AI-assisted writing competence supports safer engineering communication by strengthening terminological control and reducing ambiguity in specifications, incident reports, and risk justifications. It further aligns with academic integrity by making the writing process auditable through revision logs, source checks, and explicit authorship boundaries, which is especially important when GenAI output may be confidently wrong. Finally, it supports psychological and organisational resilience during wartime disruption by providing a repeatable workflow that helps students restart complex writing tasks quickly after interruptions while maintaining responsibility for meaning and evidence.

Conclusions

The study indicates that GenAI can strengthen English academic writing in technical students when it is positioned as a controlled editor and thinking partner within a documented "human draft – AI review – human revision" workflow, rather than as a text generator that replaces authorship. It also shows that the main learning gains emerge from iterative revision and prompt literacy, because students improve most when they must evaluate, accept, or reject AI suggestions against disciplinary meaning, genre conventions, and evidence. In the realities of wartime Ukraine, such process-oriented use functions as a resilience mechanism, helping students resume interrupted writing tasks quickly and reduce avoidable language errors without compromising academic integrity. At the same time, the findings confirm that uncritical reliance on AI introduces risks of semantic distortion in technical terminology, overconfident inaccuracies, and blurred accountability, so verification routines and revision logs are not optional but central to the pedagogy. A further implication is that assessment design should reward traceable writing processes (drafts, change rationales, terminology audits) rather than only polished final texts, because this reduces incentives for cheating and makes learning measurable.

Future research should test discipline-specific GenAI editing protocols across distinct technical genres (incident reports, requirements specifications, lab reports, safety instructions) and quantify how they affect cohesion, terminological consistency, and error rates under interrupted instruction. Further exploration is also needed on secure and ethical deployment models for Ukrainian institutions, including redaction training, data minimisation practices, and the comparative effectiveness of local or institutionally governed GenAI solutions versus public tools in high-risk contexts.

REFERENCES

1. Ding, L., Zou, D. & Kohnke, L. (2025). ChatGPT as an automated writing evaluation tool: how students perceive it and how it affects their writing. *Educ Inf Technol*. <https://doi.org/10.1007/s10639-025-13775-3>.
2. Shin, D., Lee, J.H. (2024). Exploratory study on the potential of ChatGPT as a rater of second language writing. *Educ Inf Technol* 29, 24735–24757. <https://doi.org/10.1007/s10639-024-12817-6>.
3. Lingard, L. (2023). Writing with ChatGPT: An illustration of its capacity, limitations and implications for academic writers. *Perspectives on Medical Education*, 12(1), 261-270. <https://doi.org/10.5334/pme.1072>.
4. Gasaymeh, A.-M. M., Beirat, M. A., & Abu Qbeita, A. A. (2024). University Students' Insights of Generative Artificial Intelligence (AI) Writing Tools. *Education Sciences*, 14(10), 1062. <https://doi.org/10.3390/educsci14101062>.
5. Kravchenko, K., Ketsyk-Zinchenko, U., Suduk, I., Nykyporets, S., & Cherednychenko, V. (2025). Effectiveness of online platforms in developing language skills of higher education students. *Revista Eduweb*, 19(3), 303-314. <https://doi.org/10.46502/issn.1856-7576/2025.19.03.19>.
6. Kot, S. O., & Nykyporets, S. S. (2025). Activating students' cognitive engagement in technical English learning with AI tools. In *Science and education in the third millennium: Information technology, education, law, psychology, social security and work, management. International collective monograph* (Vol. I, pp. 295-332). Lublin, Polska: Institute of Public Administration Affairs. DOI: <https://doi.org/10.5281/zenodo.16942267>.

7. Stepanova, I. S., Nykyporets, S. S., & Kukharchuk, H. V. (2025). Integrating artificial intelligence tools into project-based English language instruction for technical students: A framework for fostering critical and creative thinking. In A. Ostenda & D. Kalita (Eds.), *Innovation-driven development in education, digital economy, and applied technologies* (pp. 208-215). The University of Technology in Katowice Press. <https://doi.org/10.54264/M055>.
8. Kot, S. O., & Nykyporets, S. S. (2024). Utilization of artificial intelligence in enhancing English language proficiency in tertiary education. In *Science and education in the third millennium: Information technology, education, law, psychology, social sphere, management: International collective monograph* (Chap. 10, pp. 250-274). Institute of Public Administration Affairs. DOI: <https://doi.org/10.5281/zenodo.11279390>.
9. Nykyporets, S. S., Kot, S. O., Hadaichuk, N. M., Herasymenko, N. V., & Kukharchuk, H. V. (2025). Advancing critical thinking skills in future engineers through the analysis of AI-generated and AI-verified English-language sources. *Current Issues in Modern Science. Series "Pedagogy"*, 8(38), 1143-1155. [https://doi.org/10.52058/2786-6300-2025-8\(38\)-1143-1155](https://doi.org/10.52058/2786-6300-2025-8(38)-1143-1155).
10. Nykyporets, S. S., Melnyk, O. D., Piddubchak, S. Yu., Melnyk, M. B., & Krutchenko, O. O. (2025). The efficacy of AI-driven pedagogical strategies for foreign language acquisition in higher education. *Society and National Interests. Series "Education/Pedagogy"*, 2(10), 24-36. [https://doi.org/10.52058/3041-1572-2025-2\(10\)-24-36](https://doi.org/10.52058/3041-1572-2025-2(10)-24-36).
11. Nykyporets, S. S., Kot, S. O., Boiko, Y. V., Melnyk, M. B., & Chopliak, V. V. (2024). Advanced integration of virtual information environments (VIEs) in contemporary educational methodologies. *Society and National Interests. Series "Education/Pedagogy"*, 4(4), 139-154. [https://doi.org/10.52058/3041-1572-2024-4\(4\)-139-154](https://doi.org/10.52058/3041-1572-2024-4(4)-139-154).
12. Nykyporets, S. (2024). Information and communication technology (ICT) as a catalyst for lifelong learning and professional growth. *Distance Education in Ukraine: Innovative, Normative-Legal, Pedagogical Aspects*, 1(4), 125-136. <https://doi.org/10.18372/2786-5495.1.18888>.
13. Nykyporets, S. S., & Ibrahimova, L. V. (2023). An empirical analysis of active and interactive pedagogical strategies in the context of distance learning environments: A comparative study. In *Innovations in the education of the future: Integration of humanities, technical and natural sciences: International collective monograph* (Chap. 22, pp. 393-410). FIT CTU in Prague. DOI: <https://doi.org/10.5281/zenodo.10260124>.

Степанова Ірина Сергіївна — кандидат філологічних наук, доцент, завідувач кафедри іноземних мов, Вінницький національний технічний університет, Вінниця, e-mail: stepanova.fld@gmail.com.

Никипорець Світлана Степанівна – старший викладач кафедри іноземних мов, Вінницький національний технічний університет, м. Вінниця, e-mail: fotinia606@gmail.com

Iryna Stepanova – Ph.D. in Philology, associate Professor, Head of the Department of Foreign Languages, Vinnytsia National Technical University, Vinnytsia, e-mail: stepanova.fld@gmail.com.

Svitlana Nykyporets – a senior English language lecturer, Foreign Languages Department, Vinnytsia National Technical University, Vinnytsia, e-mail: fotinia606@gmail.com