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DEVELOPING MEDICAL STUDENTS' SCIENTIFIC WRITING SKILLS IN ENGLISH: A PEDAGOGICALLY GROUNDED INSTRUCTIONAL FRAMEWORK

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Abstract. *The article proposes a pedagogically grounded framework for developing medical students' scientific writing skills in English, with an emphasis on research article preparation, evidence-based argumentation and conference abstract writing. The work is an educational design proposal informed by selected research on writing instruction, feedback and biomedical manuscript preparation; it is neither a systematic review nor a report of an implemented intervention. The framework combines genre analysis, scaffolded practice, collaborative feedback and independent performance assessment, and comprises five interrelated stages: reading published articles as writers, developing section-specific writing skills, constructing an evidence-based manuscript, reviewing and revising, and producing an abstract while demonstrating independent performance. A design for the future empirical evaluation of the framework is also outlined. The proposed application is undergraduate Medical English instruction in Uzbekistan, with adaptation to students' language proficiency and research experience.*

Keywords: *scientific writing, Medical English, genre-based pedagogy, IMRaD, scaffolding, peer feedback, feedback literacy, conference abstract, medical education, Uzbekistan.*

INTRODUCTION

Scientific writing in English requires medical students to integrate linguistic competence with research reasoning, evidence interpretation and disciplinary conventions. Preparing a research article involves more than using appropriate vocabulary: students must establish a research problem, explain methodological decisions, report findings accurately and formulate conclusions supported by evidence. Genre-based pedagogy provides a foundation for teaching these functions explicitly by connecting textual organisation with communicative purpose and disciplinary expectations (Hyland, 2007:148-164). For original biomedical research, the Introduction, Methods, Results and Discussion (IMRaD) structure provides an established organisational framework (International Committee of Medical Journal Editors, n.d.).

Evidence from medical education supports the inclusion of purposeful writing activities, although their outcomes should be interpreted carefully. Kim et al. (2021) found that explanatory and argumentative writing supported knowledge transfer among medical students; their study, however, did not directly assess research article preparation. More directly related to academic writing, Kasai et al. (2024) reported improvements following a report-writing programme that incorporated explicit instruction and peer review for first-year medical students. These findings provide a rationale for structured instruction, while leaving the effectiveness of an English-language, article-focused framework open to evaluation.

The objective of this article is to propose a pedagogically grounded framework for developing medical students' scientific writing skills in English, with an emphasis on research article preparation, evidence-based argumentation and conference abstract writing.

MAIN PART

This paper presents an educational design proposal informed by selected research on writing instruction, feedback and biomedical manuscript preparation. It is neither a systematic review nor a report of an implemented intervention. The framework combines genre analysis, scaffolded practice, collaborative feedback and independent performance assessment. Its proposed application is undergraduate Medical English instruction in Uzbekistan, with adaptation to students' language proficiency and research experience. The framework comprises five interrelated stages.

At the first stage, students read published articles as writers. They examine selected medical research articles in order to identify the purpose of each section and the relationship between research questions, methods, findings and conclusions. Guided activities focus on how authors establish a research gap, justify a study and distinguish evidence from interpretation. This approach applies genre-based instruction to authentic disciplinary texts (Hyland, 2007:148-164).

At the second stage, students develop section-specific writing skills. Before drafting a complete manuscript, they practise manageable tasks: composing a research-gap paragraph, describing a procedure, reporting a table and discussing a limitation. Annotated examples and sentence prompts provide initial support and are gradually withdrawn. Christian and Kearns (2018) demonstrated the value of scaffolded practice for abstract

writing among undergraduate biology students; this offers a relevant instructional precedent, although its transfer to English scientific writing in medical education requires investigation.

At the third stage, students construct an evidence-based manuscript. They prepare a short manuscript using a supervised research project or a clearly labelled instructional dataset, and check the consistency between the objective, the methods, the findings and the conclusions while practising accurate paraphrasing and citation. Manuscript preparation follows the relevant biomedical guidance (International Committee of Medical Journal Editors, n.d.). Collaborative drafting may be supported through shared documents and scheduled mentoring. A randomised trial by Phadtare et al. (2009) found benefits from an online instructional package incorporating communication and writing templates; these findings should not be interpreted as evidence that digital tools alone improve writing.

At the fourth stage, students review and revise. They exchange feedback using criteria that cover scientific clarity, organisation, use of evidence, coherence and language accuracy, and each revised manuscript is accompanied by a brief commentary explaining the main changes. Research on feedback literacy highlights the importance of interpreting comments and taking appropriate action (Carless & Boud, 2018:1315-1325), while research on peer feedback supports its contribution to the development of academic writing (Huisman et al., 2019:863-880). This stage therefore treats revision as a reasoned learning activity rather than as the mechanical correction of errors.

At the fifth stage, students produce an abstract and demonstrate independent performance. They condense their manuscript into a conference abstract, adapting its structure and length to the selected submission requirements, and subsequently complete a new writing task without individual corrective support. This final task is intended to distinguish independent competence from improvements limited to a previously edited manuscript.

Future controlled research should assess students' writing before instruction, immediately afterwards and at a later follow-up, using tasks of comparable difficulty. Two trained raters should independently review anonymised texts for completeness of structure, clarity of methods, accuracy of reporting, soundness of interpretation, coherence and appropriate citation, with the agreement between raters reported. Students' explanations of their revisions could offer additional insight into how they apply feedback

and regulate their writing, in line with the principles of self-regulated learning (Nicol & Macfarlane-Dick, 2006:199-218). Confidence and satisfaction should be assessed as supplementary outcomes, while demonstrated writing ability should remain the primary measure of effectiveness.

CONCLUSION

The proposed framework connects Medical English instruction with the practical demands of scientific article preparation. Its central contribution is an instructional sequence linking the analysis of published texts, focused drafting, evidence-based manuscript construction, justified revision and independent writing. It offers an adaptable basis for teaching research communication to medical students in Uzbekistan. Its effectiveness, feasibility and longer-term contribution to publication readiness remain to be established through empirical evaluation.

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