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Empowering Novice Medical Researchers via AI-Driven Pre-Editing: Designing a Target-Journal Profile Matrix for Autonomous English Writing

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Abstract

The objective of this study is to develop a novel translation workflow that iteratively integrates AI to foster autonomous academic writing among Japanese novice physicians and medical graduate students. When preparing research papers for peer-reviewed international journals, these writers tend to rely on general AI translation tools, often failing to meet the journal's specific stylistic requirements. Conversely, our recently formulated workflow fosters active self-discovery and independent reflection, thereby enhancing researchers' professional medical writing and global communication skills. Contrary to prior research, which has exclusively focused on general linguistic and rhetorical differences between Japanese and English, this study incorporates journal-specific stylistic profiles as parameters. A systematic categorisation of top-tier medical journals is employed, encompassing five to ten domain-specific groups. A comprehensive corpus analysis of all abstracts published over two decades is subsequently conducted to extract unique syntactic preferences, including characteristic phraseologies and optimal sentence lengths. Based on these profiles, the AI identifies features in the raw Japanese abstract that deviate from the target journal's style and subsequently generates a customised pre-editing prompt. This prompt converts the raw text into an explicit Japanese format optimised for the specific journal's conventions before AI translation. The AI then provides researchers with compelling reasons for these pre-editing adjustments. Ultimately, the proposed workflow elevates AI from a mere translation tool to a metacognitive learning assistant that cultivates sustainable global literacy for international medical communication.

Keywords: Corpus Analysis; Japanese Physicians; Metacognitive Learning; Professional Communication; Translation Workflow