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Bridging Human and AI Writing: Comparison of Student Writers in Japan and the UAE with Generative AI Models

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Abstract

The rapid emergence of generative artificial intelligence (GAI) tools has disrupted student writing practices (Barrot, 2023), highlighting the need to understand how English language student writing and GAI writing differ. With the inefficacy of GAI-generated text identification tools well-established (Grassini, 2023), it is necessary to examine linguistic differences between English student-written and AI-generated writing samples. This research supports two complementary objectives: facilitating the identification of student-generated versus GAI-generated writing and aiding the development of *Auto-Peer* (McCarthy et al., 2021), an established automated writing evaluation tool developed in the UAE and currently being adapted for the Japanese EFL context as part of ongoing government-funded research (Talandis Jr. et al., 2025).

We compare first drafts of 28 argumentative (“for and against”) essays produced by university-level English learners at the A2 CEFR proficiency level, specifically second-year students in Japan and the UAE. This human-authored data was created through a *flipped interaction* (Schmidt et al., 2023) activity, where students respond to GAI-generated questions, resulting in initial drafts compiled without textual corrections. As a comparative baseline, fully AI-generated texts were also produced from similar prompts using three prominent tools: *Gemini 2.0 Flash*, *ChatGPT-4-turbo*, and *DeepSeek-V3*, expanding on Mizumoto et al. (2024).

Texts were computationally analyzed using *Coh-Metrix* (McNamara et al., 2014) and *Gramulator* (McCarthy et al., 2012) to identify differences in vocabulary, sentence complexity, text cohesion, and overall argumentative structure. This comparison helps identify culturally specific patterns among L2 writers while distinguishing these from purely AI-generated content. Results will guide the linguistic and pedagogical refinement of *Auto-Peer*, addressing the specific needs and challenges faced by foundational EFL and ESL students, thereby contributing to a broader understanding of how GAI may be leveraged to ethically and effectively support authentic L2 academic writing. Our findings also have practical applications in distinguishing student-generated from GAI-generated text.

(References available)

Keywords

Generative AI; L2 writing; computational analysis; Auto-Peer; cross-cultural comparison