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A New Era with Artificial Intelligence Powered Learner Corpora for Teaching and Learning of English as a Second Language in Primary School Education

Wei Lun Wong[1] and Sandiway Fong[2*]

*Correspondence: sandiway@arizona.edu

[1]Faculty of Education, Universiti Kebangsaan Malaysia, Malaysia

[2]Department of Linguistics, University of Arizona, USA

Abstract

This innovation reports on the design, implementation and evaluation of an AI-powered learner corpora to support English writing in a Malaysian national primary school. The intervention targeted Year 4 to Year 6 pupils learning English as a second language within the CEFR-aligned KSSR Semakan curriculum, in which a significant portion struggled with vocabulary, cohesion and sentence boundaries writing around A1 to A2 level. This work is in response to two competing tensions: i) pupils' increasing use of generative AI, which produces fast but less human-involved and locally-grounded language, and ii) the underutilisation of corpus linguistics in primary classrooms due to technical and training demands. A 152,187 word corpus of 560 anonymised pupil essays was compiled and uploaded into a retrieval-augmented custom GPT. This AI-powered learner corpora provided examples and feedback drawn only from local pupil texts and was embedded into a three-stage writing cycle: guided drafting, AI-mediated exploration and targeted revision. The design was informed by the Technology Acceptance Model and the Expectation–Confirmation Model, focusing on perceived usefulness, ease of use, satisfaction and continuance intention. Classroom observations and teacher reflections showed that pupils became more willing to revise and exhibited clearer control of basic sentence structure and cohesion. Teachers reported reduced example-generation workload and more focused conferencing. However, the impact on idea development was modest, some weaker writers engaged in formulaic borrowing and digital literacy differences shaped access to benefits. This paper concludes with practical recommendations for pedagogy, equity-focused scaling and future mixed-methods research on AI-powered learner corpora in school-based ESL writing.

Keywords: AI-powered learner corpora, English as a second language, primary school education

1. Teaching and Learning Context

The artificial intelligence (AI) powered learner corpora was implemented in a Malaysian national primary school that follows the Common European Framework of Reference (CEFR) aligned Kurikulum Standard Sekolah Rendah (KSSR Semakan) for English. In this curriculum, writing is a core component. By the end of Year 6, pupils are expected to produce short and extended texts for a range of purposes and audiences (Repo et al., 2025). The focal classes were Year 4 to Year 6. They were approximately 10 to 12 years old. English is learned as a second language and used mainly as a school subject rather than a home language. Most pupils spoke Malay, Mandarin or Tamil as their first language, with English occupying a weaker position in their language repertoires. Consistent with national evaluation studies, many pupils in these upper primary classes were writing around CEFR A1 to A2 levels, with frequent problems in vocabulary range, cohesion and sentence boundary control (Nagai et al., 2020).

In routine lessons, guided and extended writing tasks were part of continuous assessment. However, classroom observation and teacher reports indicated that writing tasks often became highly exam-oriented (Zeng & Huang, 2021). Teachers relied on model essays, substitution tables and fixed sentence frames. These practices made it easier for pupils to complete tasks but limited opportunities for genuine idea development and experimentation. Similar tensions between curriculum expectations for process writing, time-pressured and product-focused classroom realities have been reported in broader discussions of CEFR implementation in the context of Malaysian primary schools.

The school had moderate digital resources, such as a computer lab, classroom projectors and filtered Internet access. Pupils have some experience with online tools for projects, but generative AI and corpus-based tools has not been systematically integrated into English writing lessons. Teachers often described a familiar pattern of feedback fatigue, viz., large class sizes, frequent writing tasks and strong parental expectations made it difficult to provide timely and individualised comments on every draft. This mirrors wider concerns that writing teachers are expected to give more detailed and personalised feedback than ever before, with increasing risk of burnout (Maed, 2025).

Critically, the teaching and learning context allowed the innovation to operationalise key constructs from the Technology Acceptance Model (TAM). Perceived usefulness was addressed by showing pupils that the system provided immediate and familiar examples drawn from peers' texts. Perceived ease of use was supported through simple prompts and a teacher-mediated interface appropriate for pupils (Jung & Jin, 2025).

At the same time, the school's uneven access to devices and the pupils' varied digital literacy levels highlighted a potential risk. Without careful design and teacher mediation, AI-powered learner corpora could widen the divide between already advantaged pupils and weaker writers. This tension between innovation and equity is a central concern that has shaped the implementation of the present intervention.

2. Rationale for Innovation

The rationale for this innovation arises from two converging trends in school-based writing. First, generative AI tools such as ChatGPT, Grammarly and paraphrasers have become widely available and accessible to pupils. Recent studies indicate that many EFL learners

already rely on such tools to generate ideas, reorganise sentences and correct grammar. Learners generally report high perceived usefulness and ease of use, in line with the TAM (Alsaedi, 2025; Alghasab, 2025).

However, there is growing concern that the uncritical dependence on generic AI may result in to "flattened" language, weak critical thinking and texts that do not reflect pupils' own voices among lower-proficiency students (Sun & Rui, 2025). Commentaries on AI-generated essays similarly point to formulaic phrasing and the overuse of clichés. They risk making pupils' writing faster but less human, less situated and less connected to local experiences (Ng et al., 2024).

For Malaysian primary pupils, this risk is serious because they are still developing basic control of sentence structure and vocabulary. Fully outsourcing language production to AI may undermine the development of foundational writing skills. Second, corpus linguistics and data-driven learning (DDL) offer powerful ways to improve writing quality by exposing pupils to authentic patterns of language use. Corpus-based interventions have been shown to enhance lexical diversity, lexical sophistication and academic writing skills (Li et al., 2025). Learner corpora have been used to identify recurrent errors, inform targeted instruction and support curriculum design in school contexts (Bell et al., 2021). However, these benefits remain largely unrealised in primary classrooms because corpus tools such as AntConc and complex DDL interfaces require specialised training and sustained teacher development (Anthony, 2016). Corpus interfaces can be intimidating and time-consuming to use, limiting deployment to research projects or (smaller-scale) advanced courses (Bennett & Dhonnchadha, 2023).

The AI-powered learner corpora in this innovation seeks to respond to both aforementioned challenges. Instead of a generic AI model trained on adult and decontextualised texts, it integrates uploaded pupil writing into a retrieval-augmented ChatGPT environment. This "myGPT" is then used as a classroom tool that offers examples and feedback drawn only from the school's own learner corpus. The system retains the speed, interactivity and perceived usefulness that TAM studies identify as drivers of AI adoption (Zhang et al., 2025). But it also constrains the language resources to age-appropriate and curriculum-aligned texts (Alsaedi, 2025; Aksakallı & Daşer, 2025). The design therefore aims to limit the dehumanising effect of generic AI prose by foregrounding the voices and developmental trajectories of actual pupils in the same school.

Concomittantly, the innovation lowers technical barriers to corpus use. Traditional concordancers are replaced with a conversational interface that can surface concordance lines, lexical clusters and peer examples through simple prompts. This aligns with emerging work on integrating AI with corpus methods, work that argues that AI-driven front ends can make corpus insights more accessible to non-specialists while preserving the methodological strengths of corpus analysis (Anthony, 2025).

In sum, the AI-powered learner corpora represents a concrete opportunity. It harnesses the ubiquity and speed of AI while resisting its tendency to produce generic and less human language. By embedding a local learner corpus inside a user-friendly AI interface, the innovation connects corpus linguistics, TAM and sociocultural theory in a form that is realistic for Malaysian primary ESL classrooms. It treads a middle path between banning AI and accepting generic AI outputs. Moreover, it reframes pupils' own texts as the primary

engine for idea generation, language development and error repair.

3. Description of the Innovation

The innovation was designed as a full writing cycle that connects corpus construction, AI configuration and classroom routines. It was grounded in TAM and Expectation–Confirmation Model (ECM) with attention to perceived usefulness, perceived ease of use, satisfaction and continuance intention (Zhang et al., 2025). The core design principle was to make AI fast and accessible, while ensuring that the language resources remained local, age-appropriate and tightly aligned with the school curriculum.

The first phase focused on building the learner corpus. Over one academic year, the researchers collected 560 essays from Year 4 to Year 6 pupils across a range of genres (narratives, descriptive texts, simple opinion essays). After eliding names and sensitive details, texts were cleaned for basic formatting only. Spelling and grammar errors were retained to preserve the developmental profile of the writing. The resulting 152,187 words corpus was then segmented into 20 text files according to year level and task type. This structure made it easier to track which texts would be most suitable for particular classes and assignments and it preserved the longitudinal development of the cohort.

The second phase involved configuring the AI-powered learner corpora in a retrieval-augmented ChatGPT 5.0 environment. 20 corpus files were uploaded into a custom GPT (a "myGPT") designed for internal school use only. Retrieval-augmented generation (RAG) allowed the model to answer questions and generate examples by drawing first on the local corpus rather than the general internet. It is similar in spirit to how Write & Improve and Pigai use large collections of learner scripts to drive feedback cycles (Geng et al., 2024). In practical terms, this means, upon entering a prompt, the school corpus is searched first for relevant material, and the system then makes use of these materials as the basis for response.

The third phase concerned classroom implementation. Each writing unit was organised into three stages, namely, guided drafting, AI-mediated exploration and targeted revision. During guided drafting, the teacher introduced the topic, brainstormed ideas with pupils and modelled simple paragraph structures on the board. Pupils then produced an initial draft on paper or in a digital document. At this point, the teacher introduced the AI-powered learner corpora as a "writing helper" that could show how other pupils in the school had expressed similar ideas.

In the AI-mediated exploration stage, pupils worked in pairs at devices. Using scaffolded prompts prepared by the teacher, they asked the custom GPT to show "three examples of topic sentences about…" or "short examples of how to describe a place using adjectives and prepositions." The system returned responses using the language of learner corpora uploaded. When a pupil's sentence was unclear, the teacher guided them to ask the AI for "a better way to say my sentence using examples from our school writers." This process moved pupils away from copying whole AI-generated paragraphs and towards comparing their own sentences with peer-based models, consistent with data-driven learning principles (Anthony, 2016) and sociocultural views of learning through mediation (Vygotsky, 1978).

The targeted revision stage translated these examples into meaningful changes. Pupils highlighted one or two sentences in their drafts that they wanted to improve. With teacher

support, pupils used the AI-powered learner corpora to retrieve clearer peer examples and then rewrote their own sentences by combining their original ideas with the improved language patterns. The teacher monitored this process closely to prevent blind copying and to ensure that content remained the pupil's own.

After each cycle, revised essays were again anonymised and, where quality and ethics allowed, appended to the corpus. This incremental enrichment created a feedback loop similar to that reported in studies of Write & Improve and Pigai, where multiple drafting and resubmission cycles gradually improve grammatical accuracy and complexity (Jiang et al., 2020).

At the construct level, the immediacy of level-appropriate examples was expected to raise perceived usefulness, while the conversational interface and teacher-scaffolded prompts aimed to strengthen perceived ease of use (Alghasab, 2025). The repeated and positively reinforced use of the tool across units was designed to support satisfaction and continuance intention in line with ECM (Bhattacherjee, 2001).

Crucially, the innovation remained teacher-led rather than tool-led. Teachers decided which corpus segments to prioritise, when to invite AI support, and how to frame prompts so that pupils engaged in noticing and self-repair rather than passive acceptance. In this way, the design sought to combine the speed and scale of AI with the pedagogical judgement necessary to keep pupils writing authentic, developmental and locally meaningful.

4. Reflection and Impact

Classroom observations, pupil work and teacher reflections suggest that the AI-powered learner corpora had a generally positive but uneven impact on pupils' writing and on teaching practice. Overall, pupils became more willing to revise and showed clearer awareness of sentence boundaries and basic cohesion markers. This pattern is consistent with recent findings that generative AI-assisted feedback can increase revision frequency and improve writing quality when it is integrated into structured writing cycles (Mekheimer, 2025). At the same time, the primary school context revealed specific constraints that temper more optimistic claims in the wider generative AI literature (Li et al., 2025). What distinguishes the AI-powered learner corpora in this study from generic AI writing tools is that it does not generate idealised model texts. Instead, it uses AI to mediate access to anonymised sentences and short paragraphs drawn from a local corpus of Malaysian upper primary ESL writing. In contrast to conventional learner corpora, which are often static, researcher-controlled and mainly teacher-facing, this corpus was dynamically expanded with pupils' revised drafts and was designed to be directly queried by pupils during classroom writing cycles. The contribution of this study lies precisely in showing how such a locally generated AI-powered learner corpus operates in real, resource-constrained upper primary ESL classrooms and in specifying the conditions under which impact is amplified or diluted.

One clear impact was on pupils' confidence and perceived usefulness. Many pupils reported that seeing anonymised examples from "*other children in Malaysia's schools*" made the advice feel achievable and trustworthy. As one teacher reflected, "*When they see that these sentences come from children in other Malaysian schools, they say, 'I can also*

write like this,' and they are less afraid to try a second or third draft". This echoes evidence that near-peer models can support self-efficacy and engagement in AI-assisted writing (Abduljawad, 2024). Compared with experiences described in studies of generic ChatGPT use, where pupils sometimes feel disconnected from highly polished AI text, the local corpus helped situate feedback within a familiar developmental range. Teachers noted fewer "*perfect but copied*" paragraphs and more small and targeted changes to vocabulary and sentence structure. This aligns with learner corpus work showing that local corpora can make writing instruction more relatable and diagnostic (Lee, 2024). The added value here is the demonstration that a locally generated AI-powered learner corpus can counteract the over-idealisation of AI output by foregrounding attainable peer language. Hence, it provides a concrete design alternative to generic and decontextualised AI feedback.

However, the innovation did not automatically result in deeper content development. While sentence clarity improved, several weaker writers tended to search for short good sentences and then plugged them into their texts with minimal adaptation. As Teacher 02 commented, "*Some of my weaker pupils just hunt for one nice sentence and paste it in. The grammar is better, but the ideas are still very thin*". This echoes concerns in the broader AI writing literature that tools may encourage surface-level fixes rather than substantive rethinking of ideas (Li, 2024). In some cases, the local corpus even amplified formulaic language already present in the cohort to reinforce safe but repetitive patterns. This resonates with Cotos (2014) caution that learner corpora can normalise suboptimal habits if not balanced with richer models and explicit metalinguistic discussion. A key lesson here is that AI-powered learner corpora must be coupled with explicit teaching about quality, not only with retrieval of peer examples. This study therefore refines existing theory by showing how learner corpora and generative AI can simultaneously remediate and reproduce local norms and by identifying formulaicity drift as a specific risk in primary-level implementation.

From the teachers' perspective, the tool reduced some aspects of feedback workload and facilitated more focused conferencing. Instead of editing every essay, teachers redirected pupils to the corpus to see several ways of expressing similar meanings, then used class time to discuss why one option might be clearer or more appropriate. Teacher 01 summarised this shift as follows: "*I am writing fewer long comments by hand now, but I spend more time checking how they are using the tool and which sentences should go into the corpus*". This hybrid approach, in which AI and teacher feedback are combined, mirrors experimental findings that blended human–AI feedback outperforms AI feedback alone on writing development (Mekheimer, 2025). However, teachers also highlighted the hidden labour of curating prompts, monitoring pupils' interactions with the tool and deciding which revised drafts could safely be added to the corpus. The innovation therefore prompted a tectonic shift in the workload associated with feedback from manual correction towards orchestration, curation and ethical gatekeeping. This reconfiguration of labour is a substantive contribution for policymakers and school leaders who may underestimate the ongoing human work required to sustain AI-enhanced feedback ecosystems.

Several unexpected outcomes emerged. First, digital literacy differences were more salient than anticipated. Pupils who were already confident with search and navigation quickly learned how to phrase effective prompts, while others needed substantial

handholding to interpret the AI responses. As Teacher 04 noted, "*My high-digital pupils race ahead with clever prompts, but some still struggle just to scroll and read the responses carefully*". This reflects broader warnings that AI integration can widen existing inequities if digital skills and access are unevenly distributed (Li et al., 2025). Second, a small subset of pupils initially rejected AI suggestions. They perceived them as cheating despite the local corpus design. Teacher 05 reported that "*a few pupils told me, 'Teacher, this is like cheating*,' *so we had to talk about how using examples is different from copying answers*". Similar patterns of ambivalence and partial rejection have been reported in recent studies of AI feedback in higher education (Chen et al., 2025). In the upper primary context, this ambivalence signals the importance of early, age-appropriate induction into ethical and productive AI use. Overall, these findings move beyond effectiveness claims to foreground equity and acceptance as central design concerns for AI-powered learner corpora in compulsory schooling.

Finally, the innovation confirmed, albeit with some complication, emerging syntheses on generative AI in L2 writing. Systematic reviews show that most gains occur when AI is embedded in pedagogy that promotes critical engagement with feedback and human–AI negotiation, rather than passive acceptance (Li et al., 2025; Chen, 2025). In this innovation, the strongest impact was felt when teachers actively orchestrated discussion around retrieved examples and prompted pupils to explain why they changed a sentence. Where AI interaction was more solitary and unmonitored, improvements were more modest. The main lesson is that AI-powered learner corpora can be effective in upper primary ESL writing, but only when they are tightly integrated with teacher mediation, explicit AI literacy and sustained attention to equity. Researchers and practitioners may therefore refer to this study for its empirically grounded account of how a locally generated AI-powered learner corpus reshapes revision behaviour, workload and equity dynamics in primary ESL classrooms. For the concrete design principles, it offers for future AI-enhanced writing interventions.

5. Future Directions

We feel future work on AI-powered learner corpora in primary ESL classrooms should be focused in three main directions of development (to be outlined below) with respect to pedagogy, equity and research design. First, there is a need to develop more systematic pedagogical frameworks that integrate AI-powered learner corpora with existing writing curricula. Recent reviews on generative AI in language education emphasise that impact is strongest when AI is embedded in explicit process-writing instruction, metalinguistic talk and critical AI literacy, rather than used as a stand-alone tool (Li et al., 2025). Future implementations could therefore provide ready-made lesson sequences, prompt banks and reflection worksheets that help teachers move pupils beyond sentence-level repair to idea development, genre awareness and voice.

Second, scaling this innovation requires sustained teacher professional development and attention to equity. Studies on corpus-based pedagogy and AI integration show that teachers' beliefs, confidence, AI literary and corpus literacy strongly shape whether tools are used critically, mechanically or not at all (Anthony, 2025; Ibrahim & Kirkpatrick, 2024). Future innovations might adopt a collaborative design model in which teachers co-

construct the learner corpus, co-design prompts and iteratively refine classroom routines. At the same time, any expansion must address device access, bandwidth constraints and differential digital skills among pupils, as AI is a potential amplifier of existing inequalities if safeguards are not built in. Low-tech variants, such as printed concordance strips or teacher-curated corpus notebooks derived from the same dataset could support classes with limited connectivity.

Third, there is a need for more rigorous and diversified evaluation. Current evidence is promising but still exploratory. Future studies should combine fine-grained text analysis of lexical and syntactic development with measures of self-efficacy, AI literacy and critical thinking. Moreover, we should track effects over longer periods and across schools (Li et al., 2025). Mixed-methods designs that include classroom ethnography and pupil interviews would help capture how pupils negotiate authorship and ethics when writing with AI-powered learner corpora. Extending the model to other age groups, languages, and subjects, for example, secondary ESL, Mandarin, or content-area writing would also test its adaptability and inform policy-level decisions on AI integration in basic education.

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Author bio

Dr. Wei Lun Wong is a senior lecturer at the Faculty of Education, Universiti Kebangsaan Malaysia. His research interests encompass Teaching English as a Second Language, corpus linguistics, applied linguistics and educational research. He has published in high-impact journals, including Scientific Reports and SAGE Open. He actively contributes to the academic community as a reviewer for numerous Scopus and SSCI journals. He also serves on editorial boards and as an academic editor for reputable international journals such as Plos One.
ORCID: https://orcid.org/0000-0002-4367-0157
E-mail: colinw@ukm.edu.my

Professor Sandiway Fong is a full professor at Department of Linguistics, University of Arizona. His work intersects computer science and linguistics. Principally, he is interested in the computational modeling of linguistic theory. He is a member of the University of Arizona Cognitive Science Programme and Second Language Acquisition and Teaching. He has published at numerous Scopus and SSCI journals such as Nature, Behavioral and Brain Sciences and Linguistic Variation.
ORCID: https://orcid.org/0009-0002-2874-8240
E-mail：sandiway@arizona.edu