Cheung et al. *Research and Practice in Technology Enhanced Learning* (2025) 20:18
https://doi.org/10.58459/rptel.2025.20018

Research and Practice in
Technology Enhanced Learning

RESEARCH Free and Open Access

Exploring undergraduate students' learning experience and engagement in synchronous online teaching supported by corpus-based language pedagogy

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Abstract

As technological advancements and internet accessibility expand, synchronous online teaching emerges as a valuable avenue in education, providing benefits for both educators and learners. Despite its potential, there is limited research in language education on leveraging synchronous online platforms to enhance students' writing skills. This study addresses this gap by creating a synchronous online learning environment infused with corpus-based language pedagogy (CBLP) for university-level writing classes. A language teacher and 22 Social Sciences undergraduates participated in this project. Through a comprehensive analysis of the interview data from the teacher and students, and the online class interaction data, the study delves into factors influencing lesson effectiveness, examining both teacher and student perspectives on challenges faced. Furthermore, it discusses the pedagogical implications of these challenges, proposing solutions and adjustments to enhance the teaching and learning experiences associated with CBLP in a fully online educational environment.

Keywords: Corpus-based language pedagogy, Tertiary writing, Synchronous collaborative learning

Introduction

The evolution of digital-driven education has prompted the widespread adoption of online learning tools across various subjects, such as mathematics, language, science, and computer science (Kumar et al., 2021; Pang & Jen, 2018; Shen et al., 2013). In this context, synchronous online teaching has emerged as a potent collaborative learning mechanism in the educational landscape (Bower et al., 2015; Timonen & Ruokamo, 2021). Research has

demonstrated that synchronous collaborative learning significantly contributes to students' cognitive development, metacognition, cooperative learning, and communication skills (Hsu, 2022; Sun et al., 2017). Within language learning, real-time interaction has become a prevalent and effective approach (Fischer & Yang, 2022; Zhang & Liu, 2023).

Corpora, as a resource for collecting, organising, and storing textual data on a large scale, play a crucial role in providing rich, authentic linguistic material for analysis and exploration in linguistic research, language teaching, and related fields (Vyatkina, 2020). These authentic language data significantly facilitate language teaching and learning by offering a powerful tool that enhances learners' language development and linguistic competence (Egbert, 2017; Ellis, 2017). Previous studies have highlighted effective uses of corpora for instruction (Lee & Swales, 2006; Montemayor-Borsinger, 2009), assessment (LaFlair & Staples, 2017; Weigle & Friginal, 2015), and feedback (Crosthwaite, 2017; Liou & Liu, 2021). Many also report success in motivating students' interest in using corpora for autonomous learning by providing examples of authentic language use in academic or spoken registers (Charles, 2014; Tekin & Soruç, 2016).

Computer-assisted language learning (CALL) has been integrated into language teaching and learning classrooms for decades, with synchronous online teaching gaining popularity due to its efficacy as a collaborative learning mechanism in educational settings (Bailey et al., 2021; Park & Park, 2022). However, there is limited research exploring the integration of corpus tools into synchronous online delivery modes. Specifically, understanding how teachers and students experience and evaluate an online class employing multiple digital tools remains largely unexplored. In response to this gap, the present study adopted corpus-based language pedagogy (CBLP), as recently established by Ma et al. (2022), for a synchronous online English academic writing lesson with Social Sciences students in a university. CBLP involves the "ability to integrate corpus linguistics technology into classroom language pedagogy to facilitate language teaching" (Ma et al., 2022, p. 2371).

The study investigated the manner in which students adjusted to classes guided by CBLP, examining both their learning experience and engagement levels. The study will inform the use of corpus tools and CBLP in the synchronous online language classroom and, by extension, language teaching and learning in general.

Literature review

Corpus-based language pedagogy (CBLP)

A corpus stands as a comprehensive linguistic resource, encompassing a diverse array of written and spoken materials, including books, articles, transcripts, speeches, and more. With a pivotal role in researching authentic language use across various text types and contexts (e.g., Bednarek, 2020; Biber, 2019; Hunston, 2013), corpora have been integral to

language teaching since the 1980s (e.g., Johns, 1994; Lee & Swales, 2006; McKay, 1980; Sinclair, 2014; Yoon & Jo, 2014). Emphasising the role of using corpora to facilitate classroom teaching, CBLP represents an approach to language teaching and learning that incorporates the use of language corpora. This method involves analysing and leveraging these corpora to inform language instruction, providing learners with real-world language examples.

In recent decades, empirical studies have explored the efficacy of using corpora to facilitate student language learning conducted by corpus linguists or researchers, while the direct adoption of corpora by ordinary teachers remains rare in language teaching. Utilising CBLP in language teaching offers various advantages, such as enhancing vocabulary and phrase acquisition and retention (Ashkan & Seyyedrezaei, 2016), aiding in error correction (Kennedy & Miceli, 2010), refining essay drafts (Lee & Swales, 2006), and fostering an understanding of collocation (Chan & Liou, 2005). Recent research, including studies by Boulton (2010) and Vyatkina (2020, p. 308), supports these benefits, indicating higher gains and satisfaction for learners.

Nevertheless, the adoption of CBLP in language teaching and learning poses challenges related to the complexity of corpus tools, learners' computer literacy, and their ability to formulate effective corpus queries. Despite the popularity of major web corpora and concordance tools, such as the Corpus of Contemporary American English (COCA) and the British National Corpus (BNC), due to their significant size and comprehensive functionalities (Tribble, 2015), they are often perceived as complex tools for language instruction (e.g., Ebrahimi & Faghih, 2017; Quinn, 2015). Besides requiring expertise in using corpus tools, language learners may need a certain proficiency in computer operations to conduct autonomous corpus searches.

Learners' computer and corpus literacies are influenced by various factors, including age, language competence, engagement in autonomous learning (Kaltenböck & Mehlmauer-Larcher, 2005), and corpus literacy as a specific form of digital literacy (Ma et al., 2023; Mukherjee, 2006; Vyatkina, 2020). Additionally, learners unfamiliar with corpus tools may experience frustration and confusion when formulating search queries, devising research strategies, manipulating data for drawing conclusions (Kennedy & Miceli, 2010), and underutilising certain tool functions (Bernardini, 2000). Therefore, while capitalising on the benefits of corpus-based language teaching and learning, caution should be exercised to avoid imposing overly advanced learning requirements. It is essential to guide learners in forming appropriate and useful interpretations of concordance outputs to maximise the effectiveness of CBLP in language education.

Corpus-based language pedagogy (CBLP) in online language teaching

The integration of CBLP in online language teaching has emerged as a powerful approach to enhance language learning in the digital age (Ma, Yuan, et al., 2024; Vyatkina, 2020). By leveraging the vast resources and accessibility of corpora, online language teachers can create engaging and effective learning experiences for their students (Crosthwaite et al., 2023). One of the key advantages of integrating CBLP in online teaching is the availability of and access to authentic language samples (Zhang, 2022). Online platforms provide learners with easy access to a wide range of corpora, allowing them to explore and analyse real-life language use (Zaki, 2021). This exposure to authentic language helps learners develop a better understanding of vocabulary usage, idiomatic expressions, collocations, and grammar structures in context (Goodwin et al., 2022). Incorporating corpora in online language teaching also supports vocabulary acquisition. Teachers can guide students to use corpora to investigate word frequency, collocations, and usage patterns. This enables learners to expand their vocabulary repertoire and use words more accurately and appropriately in their online communication (Sert & Aşık, 2020). Furthermore, the integration of corpora in online teaching facilitates grammar instruction (Reppen, 2010). Learners can analyse corpus data to observe how grammar rules are applied in authentic language use. This hands-on exploration helps them grasp grammar concepts more effectively and apply them in their own writing and speaking tasks.

Corpus-based language pedagogy in online teaching involving collaborative learning promotes learner autonomy (Ma, Yuan, et al., 2024). By providing access to corpora, online language platforms empower learners to independently explore and investigate linguistic patterns and phenomena. This self-directed learning approach fosters critical thinking skills and encourages learners to take ownership of their language learning journey (Boulton & Cobb, 2017). Moreover, we believe that the integration of corpora in online language teaching supports interdisciplinary learning. Learners can engage with disciplinary corpora (e.g., CorpusMate by Crosthwaite and Baisa, 2022) to explore various topics and domains, such as literature, social sciences, or professional fields. This interdisciplinary approach enhances learners' language proficiency and expands their knowledge in other subject areas. By leveraging corpora in online teaching, language educators can create engaging and effective learning experiences that empower learners to develop their language skills in a digital and interconnected world.

Teachers' and students' experience and perspectives regarding CBLP

Several studies have reported mixed reactions from teachers and students after having incorporated the use of corpus tools into the language classroom. Tribble (2015) administered a teacher survey about the application of corpus programs for language teaching, in which the teachers utilised corpora for personal or students' applications, and

for preparing course and class materials. The majority of the respondents reported a significant positive impact on their teaching and considered the tools helpful for students. A recent survey study by Ma et al. (2023) shows that teachers who have possessed good corpus literacy are more willing to adopt corpora in their teaching. However, for those who did not use corpora for teaching, the main reasons included time constraints, lack of access to the relevant software or materials, and insufficient confidence in using the tool.

With regard to students' perspectives, Yoon and Hirvela's (2004) questionnaire received mostly enthusiastic responses with respect to continuing to use corpora in the future after they were introduced for writing assignments and other uses such as looking up vocabulary, phrases and grammar, and increasing confidence in writing. Another study by Lin (2016) also revealed similar reflections in that corpus-aided language learning induced positive learning attitudes in students. Further, students also found innovativeness and interest in such an approach even though it raised technical difficulties and increased workload. The students' negative responses towards corpora mainly arose from the difficulties experienced when exposed to the tools for the first time (Kennedy & Miceli, 2010; Yoon & Hirvela, 2004). Additionally, using such tools may be overly time-consuming for non-language students, whose interests may not be in linguistic details in that such an approach would be 'conceptualise[d… as a linguistic tool rather than as a pedagogical aid' (Yoon & Hirvela, 2004, p. 275).

Since online teaching becomes increasingly popular, it is imperative to examine how CBLP can be conducted in a full-online mode and investigate what challenges teachers and students may face, and propose possible solutions. Understanding the application of CBLP in fully online environments is essential not only to enhance the effectiveness of language instruction across diverse digital platforms but also to ensure that educators are equipped to overcome potential obstacles and optimise learning outcomes in the evolving landscape of online education.

Research purpose and questions

In the realm of CBLP within the English classroom, much of the existing research has centered on traditional, physical classroom settings or post-class consultations. However, scant attention has been given to exploring the integration of CBLP in a virtual, live teaching environment. The tertiary online language classroom, especially for non-language majors, presents a unique context where engagement is influenced by various behavioral, cognitive, social, and emotional factors (Luan et al., 2020). Introducing a relatively novel language teaching and learning approach in this setting has the potential to impact students' learning motivation, styles, and overall outcomes. Given this background, the present study aims to address the following research questions:

1) How do both teachers and students perceive the selected corpus tool as a comprehensive language learning tool in the online writing class?
2) What are the key factors that potentially influence the effectiveness of CBLP in the synchronous online learning environment?

By investigating these questions, the study seeks to contribute insights into the reception and efficacy of CBLP in an online setting, shedding light on the perspectives of both instructors and learners and identifying influential factors that shape its effectiveness.

Methods

The present study adopts a qualitative approach to the collection and analysis of the data (see Section "Data Collection and Analysis"). The data were drawn from an undergraduate advanced academic English writing lesson, in which the implementation of a lesson plan that adopts CBLP to teach how stance and evaluation are expressed has been examined. In particular, this study investigates the effectiveness of the approach in relation to the online teaching-and-learning mode and students' motivation and perspectives with regard to its usefulness, relevance and overall impact on language learning. The classroom interactions, students' feedback and the lecturer's reflections provide insights into the potential factors that facilitate or undermine CBLP's effectiveness.

Participants

The current study took place within a self-financed tertiary institute in Hong Kong, hereafter referred to as 'the institute.' The participants consisted of Social Sciences majors enrolled in an advanced academic writing course. The study involved a teacher and a cohort of 22 social science students. The instructor, referred to as Paul (pseudonym), possesses a background in applied linguistics and has prior experience using corpora during his master's degree research project, specialising in academic written discourse analysis during his doctoral studies. With a decade of experience teaching English academic writing and linguistics to non-native English-speaking tertiary students, Paul embarked on a new venture by participating in a series of CBLP teacher training workshops and a corpus-based English language teaching lesson design competition hosted by a university in Hong Kong. Following this training, he was recommended to implement and trial his designed lesson with his students, as detailed in the present study.

The academic writing course comprised 22 undergraduate Social Sciences students, all non-native English speakers. While meeting the institute's language proficiency admission requirements (6.5 out of 9 in IELTS or 550 in TOEFL), their overall performance in the course equated to a grade of 'C+' or 'Satisfactory.' This grading indicated that the students could handle relatively simple language challenges and articulate ideas with a general sense of logic, albeit in a somewhat fragmented manner. Notably, their written work exhibited

recurring errors, and they encountered difficulties expressing themselves with the desired academic precision. This performance pattern mirrored that of previous cohorts, all earning a grade point average equivalent to a 'C,' with instructors noting a consistent limitation in language proficiency, particularly in terms of accuracy and vocabulary range. While recognising that individual students' capacity and motivation might not be fully reflected in the overall cohort performance, there arose a need to enhance the learning of vocabulary and language patterns prevalent in academic written discourses. Such improvement would not only contribute to success in the writing course but also empower students to apply their language knowledge effectively in other courses featuring written assessments.

The design and implementation of online synchronous CBLP in writing classes

This writing course, part of the intensive seven-week summer semester in the academic year 2019–2020, focused on instructing students in summary, argumentative, and research essays, along with relevant language and structural features. The syllabus aligned with the continuous assessment components, including three separate assignments and an end-of-semester essay requiring library research. Assessments gauged language skills, understanding of theoretical concepts, organisational abilities, and expression of stance and evaluation, crucial in tertiary academic writing. Overall, the course aimed to help students achieve main learning outcomes, emphasising rational, balanced, appropriately complex, and well-supported stances, along with logical and coherent argument structuring (Hood, 2010; Hyland & Guinda, 2012).

Originally planned for the physical classroom, the lesson shifted to an online format via Microsoft Teams due to some practical constraints. Paul, aided by two research assistants, employed various digital tools, including Socrative for quizzes, Google Docs for collaborative writing, and Moodle, a learning management system. This synchronous online teaching and learning mode remains relevant beyond the research period for two main reasons. First, in the context of the institute, it becomes increasingly common for English academic writing courses to be delivered entirely online. This suggests the value for the ongoing investigations of the effectiveness of CBLP strategies in different online classroom environments. Second, in the face of rapid advancement of generative AI tools, corpus-based instruction is still deemed essential for academic literacy training (Crosthwaite & Baisa, 2023), in that language learners can still benefit from actively discovering language features and patterns commonly found in disciplinary texts. Therefore, the present study has implications for teaching practitioners who design CBLP-informed lessons on aspects such as the approach (i.e., direct or indirect) and the choice of tools according to students' computer literacy, as well as language proficiency.

The lesson incorporating CBLP occurred during the seventh class of the course. Outlined in the teaching plan (see Appendix 1), the lesson was structured based on the four-step

design principles for CBLP lessons (Ma et al., 2022). In addition, this lesson also served as a mini-cycle within a larger Teaching and Learning Cycle (TLC) focused on instructing students in crafting argumentative essays over five sessions (Polias & Forey, 2016). The primary objective of this specific lesson was to deconstruct sentence structures related to adjectives expressing stance and evaluation. Two main patterns were targeted: "It is + adjective + to-infinitive/that…" and "subject + find it + adjective + to-infinitive/that…". The lesson unfolded in four stages, following the four-step CBLP lesson design (Ma et al., 2022).

Stage 1: Raising student awareness of the target language structure. Paul commenced by reviewing the structure of an argumentative essay and emphasised the importance of effectively expressing evaluations. During this stage, he revisited the key functions of an online corpus with concordance tools ('the Tool,' hereafter), introduced in prior lessons.

Stage 2: Hands-on corpus search and inductive discovery by students. Engaging activities involving the Tool were conducted under Paul's guidance. Students delved into studying concordance lines and identifying common adjectives collocated with the targeted sentence patterns.

Stage 3: Output activities. Paul introduced a take-home rewriting task, completing one task collectively with the students.

Stage 4: Student self-evaluation and reflection. The session concluded with students participating in a brief online survey to assess their learning outcomes and reflect on their use of the corpus tool. Such student feedback can be used by the teacher to improve the next cycle of CBLP teaching.

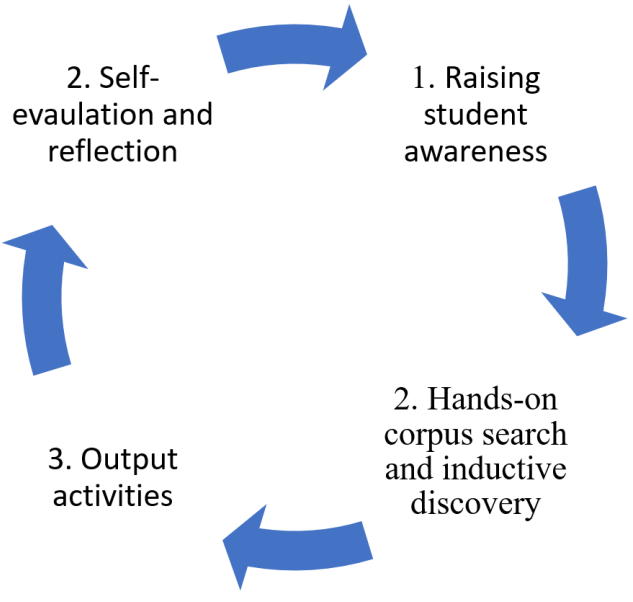

Fig. 1 The four-stage CBLP lesson

Data collection and data analysis

To address the research questions regarding the perception of the selected corpus tool and the key factors influencing the effectiveness of corpus-based language pedagogy (CBLP) in the synchronous online learning environment, this qualitative study employed a comprehensive approach to data collection and analysis. The analytical focus of the study aimed to scrutinise how the lecturer adeptly navigated the shift to an online delivery mode while integrating CBLP. Simultaneously, the research explored the ramifications of these changes on students' perceptions of this alternative approach to language teaching and learning. The overarching goal of the thematic analysis was to provide a nuanced understanding of the dynamics inherent within the online classroom setting.

In this qualitative study, a comprehensive dataset was systematically compiled from various sources, encompassing teacher and student interviews, and classroom interactions. The meticulous documentation of a three-hour online lesson was achieved through the adept utilisation of Microsoft Teams' screen capturing and audio recording features. From the lecturer's standpoint, Paul's insights were gathered through a semi-structured Pre-lesson Interview (PreI), shedding light on the course structure, student profiles, and expectations related to this CBLP lesson. A Post-lesson Interview (PostI), provided an avenue for Paul to reflect on student responses, assess learning activities, and conduct an overarching evaluation of the CBLP lesson. To complement the interview data, all pertinent teaching materials, in the electronic form, were also collected. These materials comprised lesson plans, activity sheets, presentation slides, and post-lesson reflections. Considering the student perspective, three semi-structured Focus Group Interviews were conducted with seven participants from the online writing course, as outlined in Appendix 2. These seven students were purposively sampled mainly due to their active participation in the online corpus consultation activities, and detailed reflection on their learning process during and after the lesson.

The subsequent stage involved a meticulous transcription process, employing a 'denaturalized transcription' method that focused on capturing the meanings and perceptions formed during conversations while excluding pauses, stutters, and other involuntary vocalizations (Oliver et al., 2005, p. 1277). Pseudonyms were introduced to replace participant names, ensuring confidentiality. We utilised Braun and Clarke's (2006, 2022) method, including data familiarisation, initial code identification, main code review, theme definition, and report writing, to analyse the qualitative data. In data analysis, we focused on key topics from both student and teacher interviews, leading to themes delved into students' perceptions of CBLP's relevance to their language learning motivation, intentions, purposes, and the challenges encountered during the online lesson. The collaborative effort of researchers led to the identification and agreement upon emerging

themes, subsequently illustrated using quotes from transcriptions and examples of student-lecturer interactions during the class.

Findings

Several themes emerged from the data analysis of the interview with identifying both positive and negative aspects of CBLP in synchronous online tertiary writing classrooms, revealing the potential benefits and challenges associated with CBLP adoption and adaption. The discussion is structured around two key themes: (i) the features and functionalities of the corpus tool and (ii) the factors influencing the effectiveness of CBLP in the synchronous online classroom.

Features and functionalities of the selected corpus tool

Teacher's perception: corpus tool as a comprehensive language learning tool

The selection of the tool for the lesson was primarily based on its comprehensive features and functionalities. Paul appraised the tool with a rating of 8–9 points out of 10, highlighting its versatility beyond mere vocabulary checking. The tool's capabilities extended to examining sentence patterns and determining the frequencies of specific phrases within the corpus (PostI). Its selection was further justified by its substantial size (containing over a billion words), expansive time range (1990–2019), and diverse genre coverage (encompassing eight genres, including academic written texts). This diversity facilitated the extraction of numerous examples to effectively illustrate the targeted sentence patterns. The intention was for students to apply these patterns in their academic writing tasks, expressing their perspectives and analytical insights.

Simultaneously, Paul acknowledged the tool's intricacy. Notably, the 'collocates' function, the focal point of the lesson, featured an interface requiring users to input a detailed search query, as depicted in Figure 2. This query necessitated information such as (1) the target keyword or phrase, (2) the desired collocate and/or the grammatical class of the collocate, (3) the collocate's position relative to the keyword or phrase, (4) a selection of 'sections' (i.e., sub-corpora), and (5) the initiation of the search through the 'find collocates' button. In essence, the tool's selection reflected its multifaceted utility for comprehensive linguistic analysis. However, the acknowledgment of its complexity, exemplified by the detailed 'collocates' function, underscores the need for users, including students, to navigate its features with a nuanced understanding.

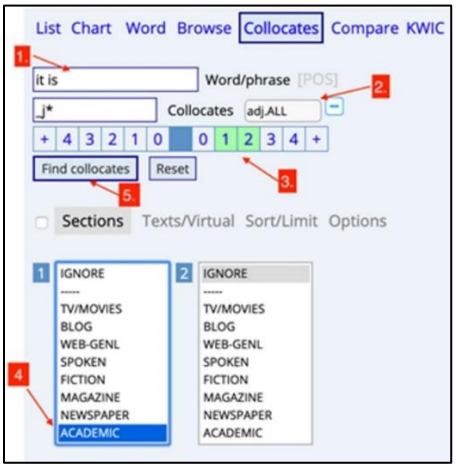

Fig. 2 The interface of the Tool for the search of collocates

Paul's choice of the tool for the lesson, despite its intricacies, stemmed from its superior ability to identify collocations compared to other web-based corpus tools like LexTutor Concordancer (https://www.lextutor.ca/conc/eng/), which, in his opinion (PreI), appeared to be less straightforward. Beyond its proficiency in identifying collocations, the tool demonstrated versatility by enabling various other searches, including the comparison of two target words or phrases, browsing forms and synonyms, and assessing the frequencies of words or phrases within the corpus. Despite its robust functionality, Paul, constrained by time, could only delve into the 'collocates' and 'compare' functions during the lesson. This limitation arose partly due to the writing curriculum's design, which initially did not incorporate the use of web corpora. Consequently, the lesson plan's integration had to occur after a brief introduction in the preceding session (PostI), leaving many of the tool's functions untouched.

These statements from the teacher underscore his recognition of the corpus tool's potential in enhancing teaching through its comprehensive features, aligning with his instructional needs. Simultaneously, Paul acknowledged the unavoidable compromise imposed by time constraints, necessitating a selective focus on specific functions during the online classroom setting.

The students' perceptions: a useful yet confusing and complicated tool

As the language learning tool was a novel experience for the students, their responses were varied. One student offered a positive perspective, supporting Paul's decision to choose the tool for its comprehensiveness, stating that it "goes into that much detail… [to] allow [them] to choose genres and sort words before or after the keyword" (Nathan, S.PI.1). Another student acknowledged the tool's utility in "forming sentences and choosing vocabulary commonly used in academic writing" (Yanny, S.PI.1).

However, the students also candidly admitted to finding the corpus tool extremely complex and challenging to navigate. A student reflected, "although the words and examples were clearly illustrated through the tool, I was very confused in the class… more explanations would be necessary to help me understand how to use [the tool]" (Monty, S.PI.2). Another student expressed that they found it "inconvenient and unnecessary to use such a complex way to look up words" (Jolyne, S.PI.3). Additionally, the lesson only covered basic functions, requiring the students to familiarise themselves with the tool (Tommy, S.PI.3). Tommy's perspective was echoed by Eden, noting that the lecturer only covered 'Collocates' and 'Compare' functions, omitting other tool features (Eden, S.PI.2).

In summary, while the students acknowledged the tool's potential usefulness for academic writing, they also deemed it overly advanced and less user-friendly for those not majoring in language studies. The time constraints prevented a comprehensive introduction of all tool functionalities during the lesson. Reflecting on their experiences, it appears the students require more time to adeptly utilise the corpus search functions. Alternatively, it is recommended that the teacher provides additional explanations to enhance the students' proficiency in leveraging the corpus tool for language learning.

Factors influencing the effectiveness of CBLP in the synchronous online classroom

Teacher's perception: unexpected disappointment with the issue-ridden online class

In his pre-lesson interview, Paul emphasised the importance of setting a 'realistic target' for his initial attempt at implementing CBLP in an actual classroom (T.PreI). The primary goal of the lesson was to rectify errors related to the structure of sentences used to express stances and evaluations in argumentative essays. The tool was instrumental in achieving this objective. Paul anticipated potential challenges in the live class, particularly related to technical issues that could impact his teaching pace and confidence. Despite these foreseen challenges, he believed that effective responses in the moment would resolve them (T.PreI). Consequently, Paul diligently rehearsed the lesson, familiarising himself with the tool's main features. Drawing from his expertise with corpora, he approached the lesson with a high level of confidence, evident in the minimal adjustments made to the finalised plan (T.PreI).

However, the actual teaching process encountered unforeseen challenges not accounted for during the planning and rehearsal stages. Paul and the class confronted several technical issues stemming from the tool's usage, including (i) cumbersome search queries, (ii) slow response speed, and (iii) limitations imposed by the free license. A specific technical difficulty arose during the formulation of search queries on the tool's website. For instance,

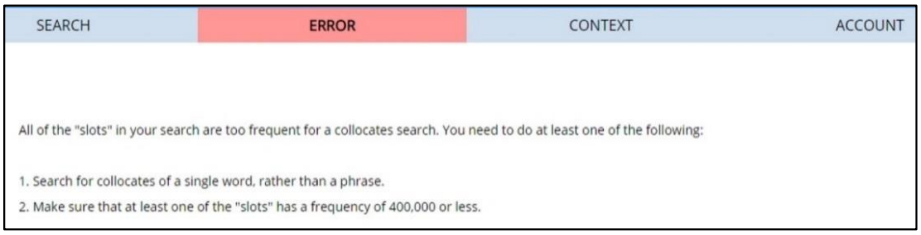

Fig. 3 An error message shown on the tool webpage

when the class attempted to search for target phrases (e.g., find it) and adjectives in specific academic sub-corpora, an error message appeared, and the corpus returned no results. This forced users to adjust their queries using complex commands, as depicted in Figure 3. Notably, this error had not surfaced during Paul's pre-class rehearsal, necessitating the determination of an alternative search method during the live session to enable students to complete the task.

The second challenge pertained to the prolonged waiting time for the tool to generate search results. For instance, during in-class activities, a student voiced dissatisfaction with the website's slow loading, requiring the class to wait for two minutes to obtain search results for answering a Socrative quiz question. Paul attributed this delay to the high volume of users engaging in learning or research activities, causing a strain on the website's responsiveness (Classroom data). The third issue involved intermittent promotional messages on the tool's website. Since the class utilised the tool under a free license, there was a limitation on the number of search queries allowed. Users would encounter prompts urging them to acquire a premium license, imposing a 30-second wait-time before resuming their search. Reflecting on these challenges in the post-lesson interview, Paul expressed frustration with the wait-time issue, stating that it significantly disrupted his teaching pace (PostI).

The disparities between Paul's expectations and the actual lesson delivery led to substantial disappointment and frustration for him. Primarily stemming from the mentioned technical challenges, these issues likely had a cascading effect on the students' overall experience with the tool during the lesson, as further discussed in the subsequent section.

The students' perception: technical difficulties hindering progress

On the whole, students appreciated Paul's efforts to provide clear guidance on utilising the corpus tool and achieving desired outcomes (Yanny, S.PI.1). They acknowledged his meticulous preparation and the practical exercises that walked them through the tool's operations step by step (Monty, S.PI.2). However, their frustration aligned with the lecturer's when technical issues emerged during the lesson. Expressing concerns about the complex search functions, one student highlighted, "The Tool asked me to set up searches

back and forth, and I found it very inconvenient" (Jacky, S.PI.3), while another remarked, "The whole tool is very difficult to use" (Monty, S.PI.2). Additionally, most interviewed students complained about the tool's slow speed, attributing it to the high number of classmates using it, and expressed annoyance at pop-up promotional messages prompting registration after approximately 10 searches (Eden, S.PI.1).

Compounding the technical challenges was the perceived lack of support from the lecturer in the online classroom setting. Despite Paul introducing basic concepts in the previous lesson, students recalled varied levels of guidance during post-lesson interviews. While one student mentioned, "Paul did teach us basic operations" (Tommy, S.PI.3), others reflected on the limited interaction in the online format, noting that the lecturer and observing research assistants could not provide immediate guidance or address corpus operation issues as efficiently as in face-to-face lessons. Comparatively, face-to-face lessons allowed for immediate problem-solving, whereas the online format left students feeling inclined to give up when struggling to keep pace with the teacher's instructions (Jacky, S.PI.3).

In summary, the class encountered numerous difficulties during the language lesson employing CBLP, primarily stemming from technical issues with the tool and the perceived lack of real-time teacher support in the online environment. Addressing these challenges became a significant disruption, casting a negative light on the students' overall perception of the tool and the pedagogic approach.

From an alternative perspective, the above findings also suggest two factors contributing to the effectiveness of CBLP in the synchronous online classroom. The first factor concerns the choice of corpus tools. While familiarity is one main consideration for adopting a certain corpus tool in classroom teaching, it is necessary for teachers to consider whether the functions of the tool are all relevant to the learning objectives and outcomes. The second factor concerns technicality involved in corpus tools, in particular how these tools behave in the online environment, such as stability and speed of the internet connection. These factors may also be applicable to other classroom settings. However, the virtual distance between the teacher and students necessitates a thorough consideration of strategies and technologies that do not overwhelm the screen with a plethora of information (e.g., concordance lines in small fonts, frequent switching of shared screens).

Discussions and implications

From the insights derived above, three key implications emerge that can guide language teaching through corpora in synchronous online settings. These implications encompass the selection and introduction of corpus tools, the presentation of corpus data in the online writing classroom, and considerations regarding students' motivation and engagement.

Selection and introduction of corpus tools

In the realm of online language teaching, it is crucial for educators to choose corpus tools that align with students' capabilities (Ma, Lee, et al., 2024) and computer literacy. Considering Paul's and the students' perspectives, an ideal corpus tool should possess user-friendly features, employing less complex search queries and simpler interfaces. Recognising that many students lacked familiarity with corpus operations, especially for more complex functions, a pragmatic approach involves indirect student engagement with corpus materials. This could entail using printed activity sheets with concordance lines selected by the lecturer (Sun & Hu, 2020). Moreover, introducing corpus tools, especially those with advanced functionalities, earlier in the curriculum—perhaps in Semester 1 of Year 1 or the initial lessons of a writing course—facilitates students' familiarity. This aligns with established longer-term corpus-informed writing courses or workshops (Lee & Swales, 2006; Tribble & Wingate, 2013). Integrating corpus tools gradually into the curriculum allows for in-depth explanations and demonstrations of their functionalities by the lecturer before students engage directly. This approach promotes a guided exploration of the tool, encouraging autonomous learning (Lewandowska, 2014; Vyatkina, 2020).

Teachers should also consider incorporating easy-to-use technical tools to support data-driven learning. For instance, tools like Linguee (www.linguee.com), a web-based dictionary with bilingual concordance lines, can serve as effective alternatives. Simplifying tools can expedite familiarity, minimising resistance to usage (Nathan & Yanny, S.PI.2). This echoes studies that leveraged fewer complex tools, such as Google search techniques, for language aids (Geluso, 2013; Han & Shin, 2017).

Presentation of corpus data in online writing classes

Addressing technical issues that may arise with the corpus tool is imperative to enhance the overall teaching and student learning experience. In addition to selecting user-friendly corpus tools, educators can explore alternative methods for presenting concordance outputs, such as printed activity sheets or presentation slides with captured concordance lines (Crosthwaite, 2019; Smart, 2014). These methods allow for a more controlled demonstration of results, reducing students' involvement in complex search queries and enabling focused analysis.

To ensure a seamless flow in corpus-based language lessons, conducting corpus consultation activities after class and promoting students' autonomous use of corpus tools after the teacher's demonstration are other viable solutions (Chang, 2014; Charles & Hadley, 2022). Demonstrating corpus search methods during the lesson and integrating the use of corpus tools into students' writing processes can enhance practical application. This method hinges on thorough integration of CBLP into the curriculum, addressing specific

issues in academic writing, such as error correction and feedback (Crosthwaite, 2017; Yoon & Jo, 2014).

Considerations regarding students' motivation and engagement

In synchronous online classrooms, distinct interactive strategies are essential for maintaining student engagement (Khan et al., 2022). It is imperative to view web-based corpora as tools within the broader language instruction landscape. Recognising the varying paces and needs of individual students is crucial for encouraging participation in online lessons. Teachers should possess both corpus literacy and pedagogic content knowledge to connect corpus resources effectively with classroom teaching, sustaining students' interest (Ma et al., 2022).

Understanding factors that contribute to students' language learning demotivation is critical. Investigating issues such as the perceived low instrumental value of teaching content, experiences of failure, or lack of intrinsic interest can guide instructors (Dörnyei & Ushioda, 2021). In the context presented, the introduction of the corpus tool, seemingly diverting from the course's objectives, contributed to a sense of failure due to technical challenges. Therefore, highlighting the instrumental value of corpus tools for addressing specific writing issues is crucial. Additionally, selecting user-friendly corpus tools and illustrating the value of corpus-based language learning can reduce the learning curve and enhance students' motivation for tool utilisation.

In summary, these implications underscore the importance of thoughtful tool selection, namely, strategic introduction, alternative presentation methods, and a nuanced approach to sustaining students' motivation and engagement in the synchronous online language classroom.

Conclusions and study limitations

This study explored the implementation of a lesson plan integrating corpus-based language pedagogy (CBLP) in an online synchronous writing session for undergraduate Social Sciences students. While not seeking broad generalisations about CBLP in the online tertiary classroom, the study identifies two key issues offering insights into designing and executing writing courses utilising corpus tools: the complex functionalities of the selected corpus tools and the accompanying technical challenges. Despite the recognised advantages of incorporating corpora into language lessons in existing literature on CBLP, the issues highlighted in this study bear significance, potentially influencing the lesson's effectiveness and students' motivation to employ corpus tools for language learning. Consequently, the case study also explores implications for future teaching in synchronous online language classrooms, emphasising necessary adjustments to enhance the teaching and learning experience when using corpus tools.

This study captures how a lecturer meticulously planned and executed a writing lesson using CBLP, evaluating this approach through comprehensive interviews with both the lecturer and students, yielding rich and valuable feedback. While acknowledging the benefits of employing complementary qualitative and quantitative approaches for investigating academic outcomes, the feasibility of quantitative methods, such as pre- and post-testing, was constrained by the study's small scale and limited timeframe for extending the investigation to a full semester. A prospective avenue, as suggested by the study, involves embracing a design-based research approach to collect experimental data before and after an intervention (Vyatkina, 2020). This approach would allow for a more comprehensive exploration of students' performance concerning the targeted language features explored with corpus tools. Another potential area of research could delve into students' perspectives on the motivating or discouraging factors influencing their engagement with peers and the teacher during language learning activities that involve various mediating tools.

Abbreviations

CBLP: Corpus-Based Language Pedagogy; CALL: Computer-Assisted Language Learning; COCA: Corpus of Contemporary American English; BNC: British National Corpus; TLC: Teaching and Learning Cycle; PreI: Pre-lesson Interview; PostI: Post-lesson Interview.

Authors' contributions

E. C.: conceptualisation, literature, methodology, coding and data analysis, writing; Q. M.: literature, writing and revision; D. S.: literature review and editing.

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Funding

The work described in this paper was supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project Number: UGC/FDS24/H11/22), and the CRAC project (04A32) funded by the Education University of Hong Kong.

Availability of data and materials

All data generated or analysed during this study are included in this article.

Declarations

Informed consent statement

Informed consent was obtained from all participants involved in the study.

Competing interests

The authors declare no conflict of interest.

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Received: 4 February 2024 Accepted: 20 June 2024
Published online: 1 January 2025 (Online First: 19 July 2024)

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