BRIDGING THE MATERIAL GAP: A PRACTICAL APPROACH TO AI-GENERATED EXERCISES

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Abstract: *English language teachers often face challenges adapting generic (commercial) textbooks to meet the specific needs of their classes, particularly in terms of vocabulary and grammar. The advent of AI offers a powerful (effective) solution for creating customized teaching materials aligned with course objectives. This article explores practical methods for leveraging the free AI tool Poe to efficiently generate tailored exercises. Step-by-step instructions cover data sourcing, personalizing AI tools, structuring knowledge bases, and writing effective prompts. These strategies empower educators to integrate AI into their teaching practices, enabling the creation of precise and effective materials suited to diverse classroom needs. Through questionnaire conducted in the workshop, this approach can be further explored.*

Keywords: *language teaching, language learning, personalized materials, curriculum design, AI content, Poe*

INTRODUCTION

By design, English as a foreign language (EFL) textbook content is collected, collated and written to be used across a diverse range of instructional contexts. To adapt textbooks to their students' skill levels and specific learning goals, instructors often need to bridge the gap between these pre-made materials and course objectives by creating auxiliary materials that reinforce the textbook content or address other factors, such as varying student abilities. Developing such materials

can be a laborious process that requires analysis of the present stage of learner's ability levels, grammar and vocabulary represented at the interim and intended levels, and incorporation of these elements into activities designed to promote retention and the learners' ability to apply this knowledge. Fundamental to the success of this process is ensuring the relevance of materials to the learners, particularly in terms of the course curriculum, the learners' world views, and their experiences (Haggis & Pouget, 2002; Martinez, 1997).

Recent advances in artificial intelligence (AI), particularly chatbots, may provide support for educators tasked with this job of aligning curriculum to the needs of specific learning contexts, but empirical studies documenting best practices are necessary. This paper has been written with this aim in mind. First, a brief history of the technology preceding chatbots is provided for context, followed by the pedagogical framework for using AI in language education. Finally, a novel approach to materials development through the use of a chatbot aggregator Poe is described.

Although chatbots like ChatGPT are many people's first experience with AI, the technology that powers them has been in development and use for some time. The range of capabilities provided by most applications built on such technology were and continue to be relatively limited in capabilities compared to chatbots. Utilizing such technology has traditionally required significant technical expertise, forcing non-technical users to depend on companies that often charge fees or require subscriptions to use their service.

Chatbots' low barrier to use make them a powerful technology readily accessible to general users. Educators in the EFL field are finding use for chatbots in teaching, assessment, and materials development. In terms of materials development, chatbots represent a novel tool that may significantly enhance the educator's capability to provide customized materials to support their learners. As will be discussed below, commercially-available chatbots vary in the output they

produce, even when given the same commands. This means that, given different requirements of a specific task, one chatbot may provide output more applicable to a particular task than the others. In light of this, being able to access output from multiple chatbots simultaneously may benefit users by reducing the time needed to interface with each chatbot independently. Poe serves this purpose. Its function is to enable communication with multiple chatbots using the same commands, which are delivered to these chatbots through the Poe interface. From now, we will provide the background educational context preceding the birth of chatbots to understand what educators' expectations and the available technological capabilities were, and how chatbots represent a new paradigm in foreign language teaching, and not simply an improvement on existing technology.

Pre-ChatGPT AI in EFL

The official release of ChatGPT in November 2022 brought AI into the consciousness of the general public, and soon after its inception, some EFL educators began to investigate the use of chatbots in their instruction. Prior to this event, language-learning technology had advanced and was being used to support increasingly complex learning, concomitantly reducing the workload on instructors so that they could focus on higher-order instructional tasks. Some applications of technology in EFL will now be discussed.

As early as 2013, intelligent computer-assisted language learning (ICALL) was being used to support the foreign-language learning process. Heift (2013) describes three types of tools prevalent in language instruction during this time: data-driven learning tools, text tools, and intelligent language tutoring systems. Specific tools in use at this time were concordance programs, which illustrate word usage in different contexts, as well as text-tools and intelligent language tutoring systems which provide various levels of form-focused feedback to learners on their grammar usage. This shows that approximately a decade prior to ChatGPT's official release in 2022, ICALL systems were advancing

toward greater adaptability through providing contextualized learning and interactive feedback. Just prior to ChatGPT`s release, EFL-focused AI tools had progressed significantly beyond those tools discussed by Heift. Through Sumakul, Hamied, and Sukyadi's (2022) description of how ELSA Speak, a pronunciation-improvement software, and Plot Generator, a story idea generation software, were used by instructors and their students, we can see that technology was being developed to support learning beyond grammar-focused instruction, extending AI-supported instruction into areas such as aural support and creative development. In contrast to these learner-focused applications of technology, relatively few tools had been created to assist educators in developing teaching materials. Chatbots have the potential to fill this gap, as will be discussed in the next section.

Chatbot features that support EFL material development

Chatbots can process and create information at varying levels of complexity, making them applicable to a wide variety of teaching tasks. For example, they can transform a teacher's ad hoc idea into a detailed lesson plan, create original materials, or, with targeted command prompts and data, tailor existing materials to match learners' ability levels or repurpose them for a different educational purpose than originally intended (Koraishi, 2023). As Koraishi points out, foreign language teachers are generally time starved, making material development difficult. Teachers working with textbooks, either pre-determined by their institution or by the teacher, often find the need to create auxiliary material that reinforces textbook contents. This is carried out through extension activities or providing reinforcement exercises so that teachers can ensure that their students are achieving course objectives with sufficient acquisition of the targeted knowledge and skills.

Materials development

The criteria used to evaluate EFL-teaching materials will depend on the purpose of the investigation. While these could be based on factors

like paper quality, binding, price, layout, size, and typeface, a more educationally focused approach would direct us to consider those elements that more effectively support the teaching and learning process (Littlejohn, 1998).

As proposed by Rubdy (2003), three broad categories for assessing the potential validity of the materials may be considered.

1. the learners' needs, goals, and pedagogical requirements;

2. the teacher's skills, abilities, theories, and beliefs, and

3. the rationale behind the materials writer's content presentation and approach to teaching and learning.

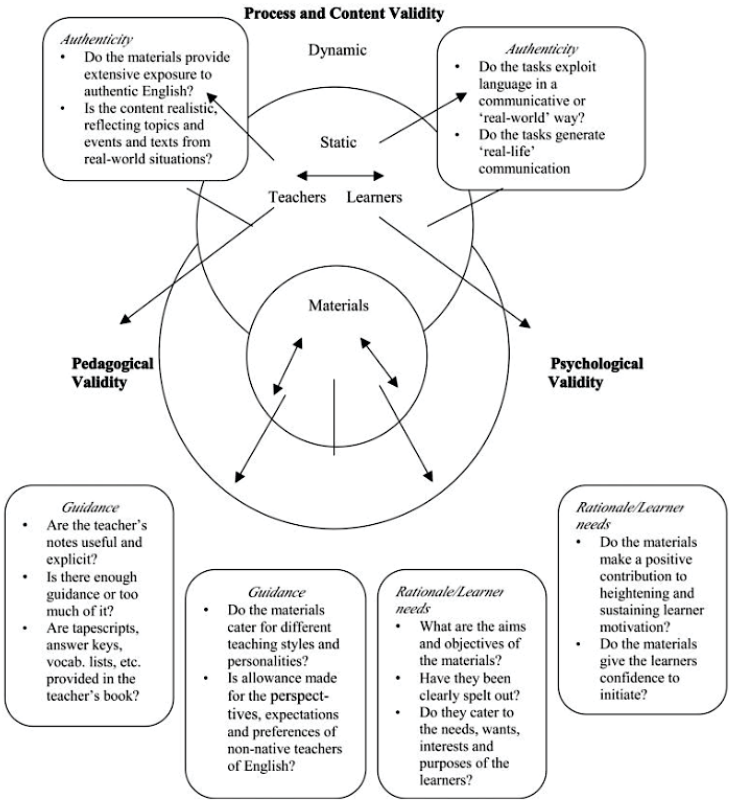

Figure 1: Adapted from Rubdy (2003), "A Static versus Dynamic Model of Materials Evaluation"

In the current study, the AI-generated content was found to support teachers' pedagogical initiatives, enabling them to develop relevant materials for practice, as shown in Figure 1. In the case of the current research, language corpus and instructions are fed into the AI-powered chatbots, creating an additional and important component to reinforce the generation of reliable exercises. Teachers have the opportunity to tailor the output so that it suits their students' background and teaching styles. Moreover, those aspects of the textbook material which the teacher would like to focus on can be incorporated into this process. Therefore, the level of proficiency, lexical range and grammatical points from the textbook can be consolidated.

Many language teachers utilize coursebooks, which may not perfectly align to the needs and preferences of every class (Tomlinson, 2010). This implies that each teacher needs to develop their own materials (English Language Centre, 1997), continually assessing, adapting, replacing, and supplementing available materials while seeking effective ways to implement them in the classroom. This is especially significant today, as the publishing industry tends to produce global coursebooks intended for all English learners, even though many are learning in specific contexts for unique purposes. Consequently, teachers-in-training should be taught materials development because the attention from applied linguists and teacher trainers involved in such courses or in publishing related literature is crucial. Beyond its practical role in preparing teachers for the challenges of classroom instruction, materials development can also serve as an effective method for helping teachers comprehend and apply language learning theories, fostering both personal and professional growth (Tomlinson, 2001).

Why Poe over other AI tools: Poe as an aggregator

The main reasons behind using Poe are twofold. First, Poe is an aggregator, allowing interactions with a variety of modern AI tools including GPT-4o and DALL-E 3 from OpenAI, Claude 3.5 from Anthropic and Gemini 1.5 from Google. Educators therefore have

flexibility to interact with the tool that they prefer, or the opportunity to explore the potential of each tool for different purposes. For premium users of Poe, the price is similar to alternative tools as seen in Table 1.

Table 1: Comparison between Poe and Alternative Tools (Updated on Dec 3rd, 2024)

Poe	Claude	Gemini + Google One	ChatGPT
$19.99/month	$18/month	approx. $24/ month	$20/month

Secondly, the platform is user-friendly. The process of creating a bot for a specific educational purpose is simple and straightforward. It also allows uploading multiple files in several formats; those files later are extracted as references to improve the accuracy of Poe's answers.

ACTIVITY OR TOOL USE PROCEDURES

As described previously, AI's use in supporting EFL has grown over the years and it will continue to evolve in its abilities. With that in mind, Poe was chosen as the AI aggregator for this project, so we will frame the discussion in the lens of using Poe, covering the procedures of the knowledge base set up, writing prompts, and a method for ensuring the generated materials fit the context in which they will be used.

Overview

When setting up an AI-based system, it is important to have clear goals and objectives to guide its development. For example, is the focus on vocabulary building, grammar, conversation skills, or comprehension? In the case of this project, we wanted to build supplementary materials to support student learning from specific units in an academic writing book (a specific example is hedging language used in discussion or writing). So, by having a goal in mind, it is possible to guide the direction of the AI.

Once the goals are set, the next step is to prepare the AI by structuring the knowledge base in a way that supports outcomes. The AI needs to

be prepped or "trained" on the materials. This process of knowledge base construction will be discussed further in the next section.

AI setup in Poe: Creating an AI

In Poe, creating an AI involves selecting the appropriate bot type and inputting the required details. For this project, we focused on developing "prompt bots" to support educational goals. Each bot was designed to address specific aspects of language learning. The process included naming the bots and providing descriptions of their intended functionalities. The three bots created for this project were named Lexigram_Gemini, Lexigram_GPT, and Lexigram_Claude. These names reflect the engines used. Once the required fields were filled out, the bots were saved for use in later stages of the project.

Structuring the knowledge base

The knowledge base plays a critical role in determining the AI's output. For this project, the educational focus was on grammar and vocabulary as the core components. The source of the knowledge was the English Profile (https://www.englishprofile.org/) database, chosen for its detailed information on word and grammar structures categorized by CEFR levels. After downloading the database, the material was cleaned to include only sections relevant to learning objectives. This cleaned version was then uploaded to Poe in PDF format, as this ensures consistency and ease of access for AI processing. The structured knowledge base allowed for precise and targeted generation of materials.

Upon completing the knowledge base, it is possible to prompt the AI to generate activities. Specific and detailed instructions are important for optimal results in this process. There may be occasions when numerous edits, minor or major, are required. There may even be situations when it is necessary to restart the prompt-development process from the beginning. The following prompt is an example of a more specific prompt to telling the AI what is needed.

> "Make a fill-in-the-blank exercise. Please provide the blank lines and give the answers separately. It should be a CEFR B1 level task in which two people (person a and person b) are having a conversation. The student needs to write hedging phrases for person b to complete the conversation."

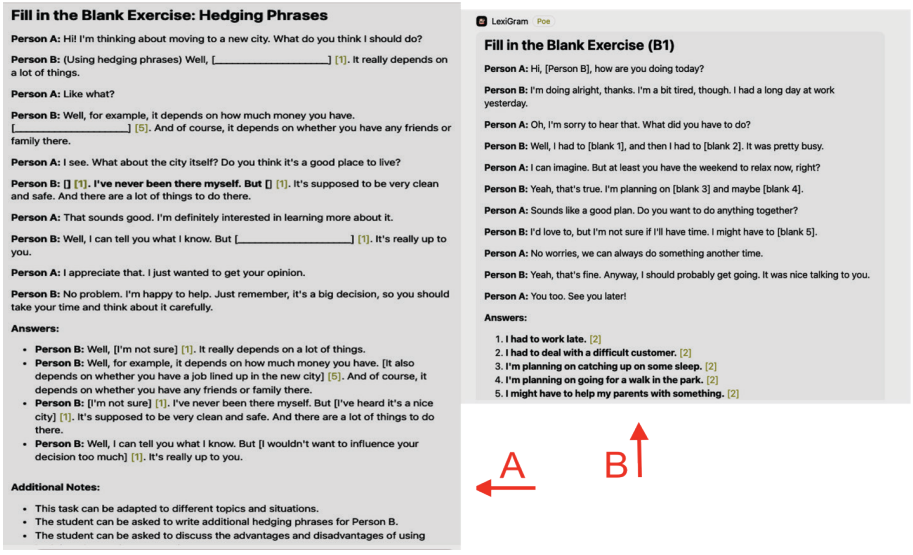

Figure 2: Output from 2 Different Lexigram AIs Created for this Study

As can be seen in Figure 2, specifics were employed such as language level, how to structure the questions, and what to focus on.

By giving such a prompt, a task was created that is easily understandable for the teacher and their students. It is important to note that the results may vary based on which AI engine used for the task. For example, Figure 2(A) used ChatGPT as the engine, while Figure 2(B) used Claude.

In this case 1(B in Figure 2) did not produce the same kind of output, but it did provide something that may be useful for instruction. Below are three more examples of prompts that could be used to produce differing outcomes.

> "Make a fill in a blank assignment focused on hedging conversation techniques. The questions should be in paragraph form with proper places for blanks. Base this assignment on using a popular children's story from Japan. The appropriate student level is CEFR B1.
>
> Make a CEFR B1 level task in which the student needs conjugate hedging phrases in a sentence. Please provide different sentences and different forms to conjugate. Also, provide an answer key.
>
> Make a CEFR B1 level task. I want you to provide the beginning of a sentence using a hedging word or phrase. The rest of the sentence is blank. The students are tasked with completing sentences based on hedging phrases provided A.I."

Following materials development, it is important to test the generated content. The process of using tools to test what was made will be discussed next.

Testing Generated Materials: Using tools like Text Inspector to assess vocabulary levels

After generating materials, it is essential to evaluate their suitability for the intended learners. To ensure that the AI-produced tasks align with the targeted language level, text analysis tools can be employed to help verify whether the vocabulary and grammar match the proficiency levels of the students. Below are some suggested tools.

Oxford Text Checker (Text checker | Oxford Learner's dictionaries, 2024) https://www.oxfordlearnersdictionaries.com/text-checker/

- Text Analyzer (Find the CEFR level of texts, 2024) http://www.roadtogrammar.com/textanalysis/

- Text Inspector (Analyze and adapt your text, 2024) https://textinspector.com/

DISCUSSION

Suitability of Various AI-Generated exercise types for specific language skills

In exploring the integration of AI-generated exercises in language learning, it becomes clear that AI-based software can support the creation of a wide range of questions.

Multiple-choice questions are particularly suited for assessing vocabulary and grammar understanding. They allow learners to engage in quick recall, reinforcing memory through repetition and immediate feedback. This format can be especially beneficial for beginners who are familiarizing themselves with basic structures and vocabulary. While this method is efficient for assessment, it may not fully capture a learner's ability to use language dynamically in real-life situations.

Open-ended questions are thought to be beneficial for enhancing students' cognitive abilities, as they prompt students to articulate and expand on their ideas while justifying their reasoning (Lee et al., 2012). Therefore, these exercises are invaluable for developing writing and speaking skills, as they require learners to construct sentences and articulate their viewpoints. By engaging with open-ended questions, students practice formulating coherent arguments and using language flexibly. This type of exercise fosters critical thinking and allows for a deeper exploration of language nuances, making it particularly effective for intermediate and advanced learners.

Grammar exercises, such as fill-in-the-blank activities or sentence transformation tasks, play a vital role in solidifying learners' understanding of syntax and structure. These targeted exercises can be adjusted in difficulty to cater to learners at different stages, ensuring that each student is both challenged and supported. The flexibility of AI allows for the automatic adjustment of exercise complexity based on individual performance, creating a personalized learning journey. Moreover, the explanation alongside the reference to the language foundation input could validate the authenticity of the generated

exercise. With different AI-generated platforms such as the three programs made for this research (Lexigram_Gemini, Lexigram_GPT, and Lexigram_Claude), EFL teachers are expected to tailor their own teaching styles, learners' needs as well as the authenticity of materials to choose their most desirable results.

Identifying the purpose and objectives for each exercise

Defining clear objectives for each AI-generated exercise is crucial to ensure that desired outcomes are achieved. For example, if the goal is to improve conversational skills, exercises should focus on role-playing scenarios that mimic everyday interactions. In contrast, if the aim is to enhance reading comprehension, exercises might involve summarizing texts or answering reflective questions based on readings. By identifying the purpose behind each exercise, educators can tailor their approach, ensuring that learners are not only practicing language skills but also developing confidence and autonomy. This reflective process allows for continual adjustment and improvement of the exercises, enhancing their relevance and effectiveness in bridging the material gap in language education. Ultimately, the thoughtful integration of AI-generated exercises into language learning requires a balance of creativity, clarity of objectives, and an understanding of the diverse needs of learners.

CONCLUSION

Developing and adapting EFL materials is essential, as publishers cannot tailor resources to every context. Educators, familiar with their students' abilities and learning styles, are best positioned to create such materials. However, before the advent of chatbots, this process was often time-consuming, especially when integrating information from databases like corpora.

The aggregator Poe (especially with Lexigram) provides an extra level of support by enabling educators to interface with multiple commercially available chatbots. These chatbots produce unique materials, even when given the same source data and instructions, due to differences

in their underlying programming. This reduces the educator's need to interface with different chatbots individually. While the use of chatbots in educational contexts is still in a nascent state, it will undoubtedly evolve through such factors as an increase in chatbots in and an increase in their processing capabilities. This paper has attempted to showcase the potential of Poe as one tool that educators can use to make their teaching more effective through a structured use of AI.

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