

Introduction*

The public release of ChatGPT by OpenAI in November 2022, and the subsequent release of a plethora of generative artificial intelligence (GenAI) tools by different technology companies, has led to intense wonder, surprise, excitement, concern, and worry about their capabilities (Moorhouse, 2024). These tools offer the potential to assist language teachers in helping their learners achieve their language learning goals, and, at the same time, risk disrupting language teaching and learning processes, the teaching profession, and possibly the instrumental needs to learn foreign languages (Jeon & Lee, 2023; Moorhouse & Kohnke, 2024). We believe that teachers are essential to effective and holistic learning, and they will not be replaced by artificial intelligence (AI), however, AI could help augment their abilities and intelligence. It is important for language teachers to develop the knowledge and skills associated with using GenAI to help their learners navigate the GenAI-infused world but also become critically informed about the ethical and social issues associated with these tools' development. To do this, teachers should model ethical, legal, and safe ways to use GenAI (Hockly, 2023) and help learners think critically about how AI shapes and changes society. At the same time, it is imperative that language teachers can distinguish between the 'hype' surrounding these tools, and evidence-informed professional use of GenAI. This allows language teachers to have greater agency in their use of GenAI tools with thoughtful consideration for how GenAI may shape language teaching. Although language teachers' digital competencies and confidence in using technology have increased since the Covid-19 pandemic, which forced teachers to use technology to mediate teaching and learning (Lee & Jeon, 2024; Moorhouse, 2023), the complex and diverse uses of GenAI tools necessitate unique competencies (Ng et al., 2023).

This Element is centred around the idea that language teachers need new and specific skills and knowledge to use GenAI in their professional practices. We argue that these tools are so different from previous technological advancements that developing these skills and knowledge are essential to the profession (Mishra et al., 2023; Ng et al., 2023). Although there are various frameworks that can be used to help conceptualise the competencies needed to use technology (e.g., technological pedagogical content knowledge), in this Element, we have adapted professional digital competence (Instefjord & Munthe, 2017). Professional digital competence conceptualises that different professions utilise technology differently in their professional practices (Knoth et al., 2024), and, therefore, the knowledge and skills needed to use technology are different. For example, a doctor and a language

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teacher will use different technologies or even the same technologies in different ways than each other as part of their professional practices. Yet, both need a level of digital competence to effectively engage in their professional tasks and be considered professionally competent (Knoth et al., 2024). Equally, GenAI is affecting each profession differently. A doctor may need to understand and apply the use of AI in medical diagnostic processes. In contrast, a language teacher may need to guide students in how to use GenAI tools to engage in language practice activities. Therefore, in this Element, we adopt five aspects of a newly conceptualised construct, ‘professional-GenAI-competence’ (P-GenAI-C), to conceptualise the knowledge and skills needed by language teachers in the GenAI world. The aim is that by engaging with this Element, language teachers can develop these five aspects and, therefore, be able to implement GenAI tools effectively and responsibly into their professional practices. The five aspects are:

1. GenAI technological proficiency: Technological proficiency is concerned with teachers’ awareness of a variety of GenAI tools, including their functions, uses, and affordances.
2. Pedagogical compatibility of GenAI in English language teaching (PC): PC refers to teachers’ use of GenAI tools to supplement and enhance their students’ English language learning, including using GenAI tools to help them achieve their learning objectives.
3. Teachers’ professional work: Professional work is concerned with the use of GenAI tools in teachers’ professional work outside of the classroom, including grading and giving feedback, communicating with stakeholders, and school administration.
4. Risk, well-being, and the ethical use of GenAI (EU): EU refers to teachers’ awareness of the risks associated with using AI, the effects that GenAI tools may have on teacher and learner well-being, and the ethical issues pertaining to the use of GenAI tools.
5. Preparation of students for a GenAI world: Preparation of students relates to a teacher’s abilities to prepare their students with the knowledge and skills needed to critically and productively engage in GenAI tools in their learning, recreation time, and future work.

Aspects of P-GenAI-C will be referred to throughout the Element, with case studies and questions used to help readers develop their P-GenAI-C.

Element Overview

This Element has eight sections. In Section 1, the question ‘What is GenAI?’ is addressed along with details of different kinds of GenAI tools and their

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capabilities. Section 2 explores how GenAI tools can be used to assist teachers as a knowledge resources and development tool. In Section 3, the attention moves to examining how GenAI can assist with lesson planning and materials preparation. Section 4 focuses on the use of GenAI in assisting teachers with assessments and feedback. In Section 5, we consider the roles GenAI can play in supporting students' language learning. Section 6 puts forth important ethical and social issues related to GenAI use in language teaching and learning. In Section 7, essential knowledge and skills language teachers need to effectively engage with GenAI are provided. Finally, Section 8 focuses on the future and how language teachers can stay up to date with relevant developments and continue to evolve their practices to the latest technological advancements in the GenAI age.

The Element provides an accessible introduction and guide to the use of GenAI and language teaching. It is a valuable resource for pre-service and in-service language teachers of all experience levels. Each section includes helpful tips and questions for reflection to get teachers started with GenAI while ensuring they engage critically and responsibly with these tools. Evidence-informed approaches are promoted throughout the Element.

GenAI Use in This Element

Throughout the Element, various GenAI tools are referenced and used to illustrate the capabilities and limitations of the tools for language teaching and learning purposes (see Appendix 1, available online at [short url], for the list of tools referenced in this Element). It is important to note that the tools selected are only a sample of the tools available, and we do not endorse any specific company or product in this Element. Readers can take reference from the Element but are advised to explore the variety of tools available to them and select the most appropriate ones for their context and needs. As the capabilities and features of GenAI tools are constantly advancing, the reader's experience of the tools may be different from the examples provided in the Element. However, we hope the content and skills explored inspire readers to try out these tools in their professional practices.

1 Generative AI

GenAI-Generated Summary of the Section

We thought it would be fun to demonstrate the potential of GenAI in the Element itself. Along with many examples embedded in the sections, we will also provide a GenAI summary of each section in different genres. For Section 1, we asked GPT-4.o for a simple summary. Our prompt was:

This is the first section of a book designed as a resource for language teachers and scholars interested in the application of generative AI tools in language teaching. Can you write a 100-word summary of the section as a lead-in to the section to demonstrate the capabilities you have to provide contextualised summaries of extended texts?

The conversational AI chatbot created the following summary:

Summary of Section 1: Generative Artificial Intelligence This section introduces Generative Artificial Intelligence (GenAI), highlighting its transformative potential in language teaching. It contrasts GenAI tools, such as large language models (LLMs) like ChatGPT, with traditional rule-based AI tools. Unlike earlier AI systems, GenAI leverages deep learning and extensive datasets to generate diverse content, from text and images to audio and video, in response to user prompts. The section categorizes GenAI tools into conversational AI chatbots, visual/audio/video generators, and tools with embedded GenAI functions. It emphasizes their adaptability, speed, and evolving capabilities while raising questions about their impact and ethical considerations in educational contexts.

We can see from the summary that the GenAI tool successfully identified the main points from the section and succinctly and accurately summarised them in a coherent text.

What Is GenAI?

The question, ‘What is GenAI?’ is not as easy to answer as one might think. First, we should consider the term, artificial intelligence. Generally, AI refers to computer systems that utilise algorithms to mimic human cognitive abilities and carry out tasks traditionally needing human intelligence, such as speech recognition, decision-making, and pattern identification (Ali et al., 2024; Sheikh et al., 2023). It is a broad concept that is used to encapsulate a diverse range of technological functionalities, including robotics, recommendation systems, voice recognition, and chatbots.

In language teaching, before the release of ChatGPT, two types of AI tools were commonly promoted by language educators and scholars for several years due to their perceived utility in assisting language learning – chatbots and digital writing assistants (Fryer et al., 2020; Kohnke, 2023). Chatbots could simulate specific interlocutors (e.g., customer service agents) and discuss particular topics (Kohnke, 2023). They could be used to provide opportunities for language learners to practice specific interactions (Chiu et al., 2023). Digital writing assistants can provide corrective feedback on learners’ written work (Lee, 2020), including individualised feedback on students’ writing. However, these kinds of AI-powered tools are rule-based programs based on predefined

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guidelines derived from external knowledge –sometimes called predictive AI. Each tool was designed to perform a specific role and could not deviate from its pre-programmed answers. As such, the functions of technological tools were determined during their programming and inception, limiting the outputs or tasks they could engage in. For example, a chatbot designed to be a customer service agent for a public transportation service could respond to users' queries about the time of the next train but could not respond on other topics or in other roles (unless trained to do so) (Chiu et al., 2023). While researchers saw the potential of these kinds of rule-based AIs in language teaching, due to their narrow functionality, they have experienced very limited uptake in language classrooms. Generative AI is different from these rule-based AI tools. It is easy to see why their arrival has been heralded as a technological revolution that has the potential to transform how we work, play, relate, and learn (Meniado, 2023; Moorhouse et al., 2023).

Generative AI refers to a subset of AI designed for generating various types of content, including text, code, videos, and images (Chan & Colloton, 2024). Among the most popular GenAI tools in language teaching are large language models (LLMs), such as generative pretraining transformers (GPTs), which include OpenAI's ChatGPT and Anthropic's Claude platforms. These LLMs utilise deep learning techniques and extensive datasets sourced from the internet or specialised knowledge bases to produce new and often surprising content in response to diverse and complex prompts like scenarios, images, instructions, or questions (Lim et al., 2023). Instead of relying on predefined rules, LLMs generate content by identifying patterns and relationships within the data to produce statistically probable outcomes (Fui-Hoon Nah et al., 2023). For example, they can predict the next word or token in a sentence to craft coherent text. The adaptability of LLMs like GPTs allows them to be used in various contexts to perform numerous natural language processing tasks without specific instructions (Ali et al., 2024). Extensive training has been used to increase the reliability and predictability of these tools. Moreover, GenAI tools work extremely fast – usually producing content in seconds (Moorhouse, 2024).

Besides LLMs, other models have been developed to analyse and create visual and audio data (e.g., generative adversarial networks (GANs)). Some GenAI tools combine LLMs and GANs to provide an easy-to-use interface using natural language that generates multimodal output. Generative AI tools have incredible functionality. This is why a user can ask an image-generating GenAI tool, such as Dall-E 3, to create an image using natural language, for example, prompting 'an elephant flying a plane with a monkey on its shoulder' and allowing the tool to interpret and create a unique output (see Figure 1 for the hilarious result).



Figure 1 A Dall-E 3-created image of the prompt: An elephant flying a plane with a monkey on its shoulder.

Types of GenAI Tools

It can be challenging to neatly categorise the different kinds of GenAI tools currently available for language teachers. Many tools have multiple functionalities and combine different AI technologies to make them easy to use while performing highly advanced tasks. Some tools are designed for very specific tasks and professions (e.g., medical diagnostic tools) and others are for general application (e.g., conversational AI chatbots). The field is moving incredibly quickly and the types and functionalities of GenAI continue to expand exponentially. One way to classify GenAI tools for language teaching is according to the following three categories: 1. conversational AI chatbots; 2. visual, audio, and video generators; and 3. tools with embedded GenAI functions and specialist AI tools.

Conversational AI Chatbots

Conversational AI chatbots is another name for LLM-based chatbots of GenAI chatbots, with the terms often used interchangeably within language teaching literature. The term ‘conversational AI chatbots’ predates LLM development and was used to describe rule-based chatbots. It has continued to be used to describe LLM-based chatbots. In this Element, we use conversational AI chatbots to refer to LLM-based AI tools. This category includes models by OpenAI (e.g., ChatGPT 3.0, GPT-4.o), Google (e.g., Gemini 1.5-Flash), Anthropic (e.g., Claude), and Meta (e.g., Llama). These AI tools have a human-like conversational interface where the

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user can engage with the tool using natural language (e.g., posing questions, giving responses, making statements). All these models can interpret written text input or prompts, with some able to analyse and interpret multi-modal inputs (e.g., texts, images, and videos). Each model has different strengths and limitations (see Section 7 for a more detailed discussion of the differences between AI models). Large language models can be combined with other types of AI architecture (e.g., GANs) to create multi-modal outputs. They can conduct a wide range of human-like tasks. Here are some tasks conversational AI chatbots can perform:

Content Creation

Conversational AI chatbots can generate a broad selection of human-like texts due to the large dataset from which AI tools draw. Users can specify the genre, audience, topic, length, style, and any other desired features, and the tools will generate a relevant text that aligns with the provided specifications. This can include creative works such as specific kinds of poems, songs, and stories; texts for personal and professional communication, such as e-mails, letters, or social media posts; and academic texts, such as argumentative essays, persuasive texts, opinion pieces, and expositions. For example, a primary school language teacher may wish to create a poem on a specific topic or theme they are exploring in their unit, and include some of the key vocabulary from the unit in the poem. They could prompt a conversational AI chatbot with their specifications, and it will generate content following the details in the prompt. For example, the prompt could be, ‘Write a three-stanza poem for young language learners in Hong Kong on the topic of transport. Include the following words in the poem: bus, car, taxi, tram, train, bicycle.’ A chatbot (e.g., GPT-4.o) would create a poem like this one:

In Hong Kong’s streets, the buses go,
Through bustling lanes, both high and low.
With cars and taxis zipping fast,
We watch the lively city cast.

The trams glide by on tracks so neat,
A charming way to tour each street.
The trains beneath the ground, they zoom,
Through tunnels dark, they pierce the gloom.

On bicycles, we pedal free,
By parks and shores beside the sea.
In Hong Kong’s transport, near and far,

Adventure waits with each new star.

Teachers can then interact with the conversational AI chatbot to modify the generated content to better meet their needs. For example, the teacher may feel the poem is too challenging for his/her learners. He/she can input a follow-up prompt suggestion to modify the poem for the learners. The prompt could be: ‘Can you reduce the lexical demands in the poem?’ A chatbot (e.g., GPT-4.o) would create a modified poem like this one:

Hong Kong Rides

In Hong Kong, buses go,
Through busy streets, high and low.
Cars and taxis drive so fast,
We watch the city as they pass.

Trams on tracks, they glide so slow,
Through the streets, nice and low.
Trains zoom fast, under the ground,
In the tunnels, all around.

On bicycles, we ride with glee,
By the park and near the sea.
In Hong Kong, with every ride,
We find fun and joy inside.

The teacher can continue to interact with the conversational AI chatbot to modify the text (e.g., text difficulty or change the context/topic of the poem), or task it with creating related content (e.g., comprehension questions, other genres or text types using the same topic). The teacher can also end the interactional sequence by ‘clearing context’ and start a new sequence or conversation.

Conversation Partner

Conversational AI chatbots can engage in coherent contextualised back-and-forth conversations on a multitude of topics and scenarios. This means they can be given a ‘role’ and can engage in a conversation in that role, including interacting with job interviewers, customers, friends, teachers, or even famous fictional characters. Users can provide a character description of the alias that the conversational AI chatbot is adopting. For example, a disgruntled customer, a supportive colleague, or a demanding job interviewer. Here is an example interaction with GPT-4.o playing the role of a disgruntled customer:

Initial Prompt: I am a sales assistant in an electronics shop. I want to practice my customer service skills. Can you take up the role of a disgruntled customer who bought a new toaster that they are not satisfied with?

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GPT-4.o: Sure! Let's roleplay. I'll be the disgruntled customer, and you can practice handling the situation. Let's begin: *Customer: Excuse me! I need to speak with someone about this toaster I bought here last week. It's absolutely useless! I can't believe you sell such low-quality products. It doesn't even toast bread properly!*

User: I'm sorry to hear that. Can you describe to me how you use it?

GPT-4.o as customer: *How I use it? I mean, it's a toaster – it's not rocket science! I plug it in, pop the bread in, and press the lever. But no matter what setting I use, it either burns the bread to a crisp or barely warms it up! I shouldn't have to fiddle with it every single time just to get it to work right.*

User: How can a help solve this issue?

GPT-4.o as customer: *Well, for starters, I'd like a toaster that actually works! I paid good money for this one, and it's been nothing but a headache. Are you going to replace it, or do I have to take this up with someone higher up?*

In this interaction, the conversational AI chatbot accurately imitates the language features related to the role as well as the persona it has been asked to adopt. The use of language and phrases such as, 'It's absolutely useless' and 'Well, for starters ...' show the likely frustrations expected from a disgruntled customer.

Given the large databases that many of the conversational AI chatbots draw from, they are able to imitate the 'spirit' and 'mannerisms' of fictional characters or famous people (although adopting another persona may have ethical implications – see Section 6 for a detailed discussion). Some conversational AI chatbots may remind users that they are not the actual person the user is interacting with before they start the conversation. For example, GPT-4.o was asked to take on the persona of Roald Dahl, the famous children's author, and answer questions about his life:

Initial prompt: Could you take on the persona of Roald Dahl and answer questions about your life as him with short answers?

GPT-4.o: Of course! I'll take on the persona of Roald Dahl and answer your questions as if I were him. Fire away!

User: Why did you start writing children's books?

GPT-4.o as Roald Dahl: Ah, well, I started writing children's books because I wanted to entertain my own children. I loved telling them bedtime stories, and their laughter and excitement inspired me to write tales that could delight children everywhere. Plus, there's nothing quite like the imagination of a child!

User: Which was the first book you wrote?

GPT-4.o as Roald Dahl: The first children's book I wrote was *The Gremlins* in 1943. It was inspired by RAF folklore during my time as a pilot. But my first real success in children's literature came later with *James and the Giant Peach* in 1961. That's when the magic truly began!