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Generative AI and Language Education: Opportunities, Challenges and the Need for Critical Perspectives

Cambridge Papers in English Language Education

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Author biographies

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Setting the scene

Language education is going through a 'calculator moment'.

The widespread availability of pocket calculators in the 1970s and 1980s transformed mathematics learning, teaching and assessment. It enabled some mental arithmetic skills to be entirely taken over by the calculator, freeing students' minds to work on higher-order mathematical problems. At the same time, certain arithmetic skills – for example, learning the times tables – have remained part of primary school education (even though it can be easily done by a calculator) since they are essential to understanding foundational aspects of mathematics.

Generative AI (GenAI) will be a similar transformational force in second/foreign (L2) language education. It will push L2 education to define, develop and incorporate new skills and success criteria, while preserving the core of language learning and assessment and skills that still matter.

GenAI has the potential to enable personalised and engaging learning experiences for students, and assists educators with content development for learning and assessment. The open availability of GenAI technology and its wide social acceptance, sparked by the release of ChatGPT by Open AI in late 2022, have created huge interest and excitement across the L2 community. A webinar, run in January 2024 by Cambridge University Press & Assessment on the topic of using GenAI in L2 education, and a panel discussion on the same topic two months later, attracted a live audience of over 9,000 language teachers – testimony to the integral role L2 teachers believe this technology will play and their appetite for increasing their knowledge and expertise in this area.

As with all powerful technologies, tremendous opportunities come hand-in-hand with significant concerns and risks. Employing these AI models in education, including in language education, poses risks such as perpetuating biases, providing inaccurate information, facilitating academic dishonesty, and decreasing the perceived value of human teachers. More broadly, the rise of systems that can assume cognitive tasks once exclusive to humans raises important ethical questions regarding the potential overreliance on AI (Bhatnagar et al., 2018).

The choices we make now about GenAI in L2 education will significantly impact the future of language learning, teaching, and assessment. The aim of this paper is to **provide a critical perspective into the role of GenAI in L2 education**. Such a perspective is foundational to policy and practice decisions.

Our intended audience are the key stakeholders in language education – learners, teachers, teacher educators, coursebook materials developers, test developers, and policy makers. We aim to provide considerations, insights and questions as a foundation for making informed decisions around policy and practice.

The insights, questions and issues we raise set the scene for more in-depth exploration of relevant issues in forthcoming entries in Cambridge Papers in English Language Education that focus on the role of GenAI in language learning, teaching, assessment and ethics of use in the education field.

Key terminology

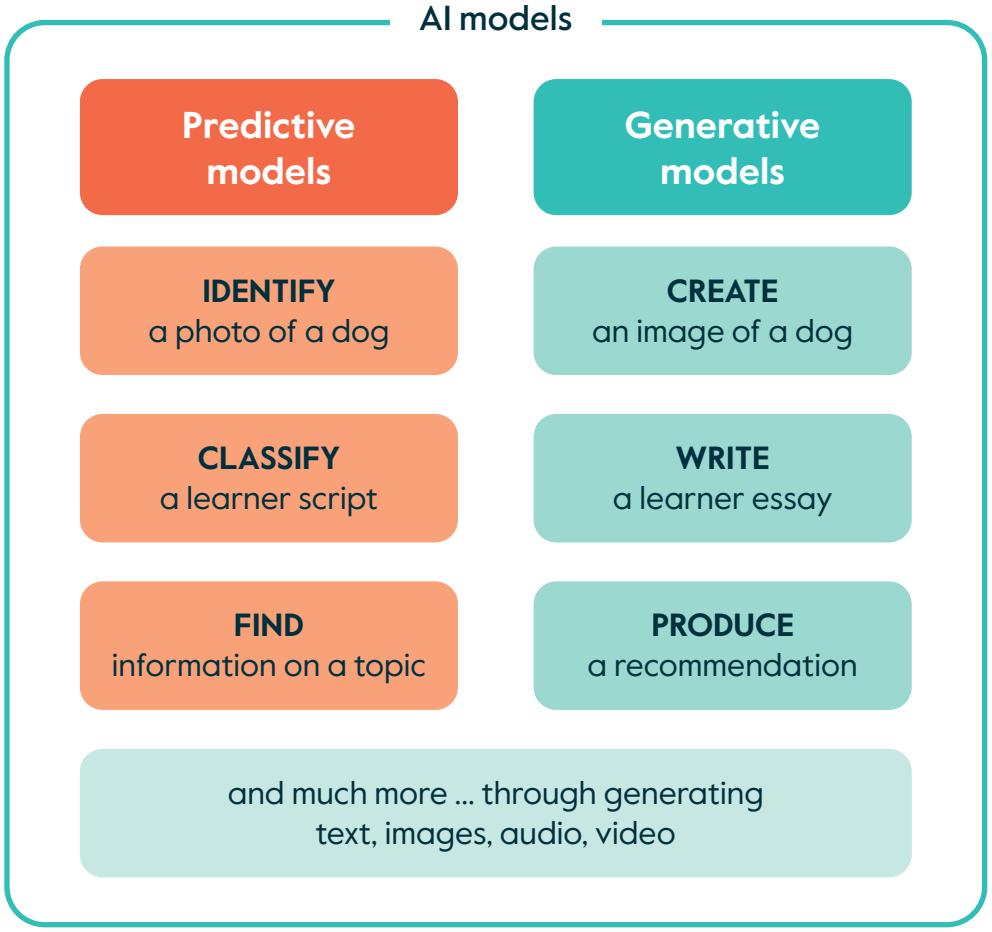
Artificial Intelligence (AI)

Broadly speaking, AI is technology that is capable of actions and behaviours that would require intelligence if done by humans. A particularly useful definition is that provided by the European Commission High-Level Expert Group on Artificial Intelligence: 'systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals.' This definition also usefully stresses that AI can be software-based, such as voice assistants, speech-to-text and search engines, and it can be embedded in hardware, such as self-driving cars, robots and drones (read the full definition in the 2018 European Commission report).

Predictive AI vs generative AI

AI models can be *generative* (also known as *foundational* models), as opposed to the more traditional *predictive* models (also known as *classification* models). Predictive models are able to *perceive* and *classify* information; in contrast, generative models are able to *create* content. For example, instead of just identifying a photo of a dog, say, or classifying a learner script into a category on an assessment scale, GenAI models can create an image of a dog or write a learner essay.

ChatGPT, Gemini and Claude are examples of GenAI. This type of AI can process multimedia, including natural language text and images, and respond to instructions (known as prompts) with coherent, customized human-like responses. Based on the prompt, that output can be text, images, audio, video, and other content such as code. For example, when a GenAI system is given the prompt 'You're a language teacher. I'd like you to create a reading text and comprehension questions on the topic "Unusual world foods" with illustrations supporting the reading topic', it can produce output which resembles that developed by a teacher.



Large Language Models (LLMs)

GenAI is enabled by Large Language Models (also known as LLMs). These are powerful Machine Learning models that are trained on vast datasets and powered by massive computing power. ChatGPT, Gemini and Claude are the names given to such LLMs. For a useful overview of basic characteristics of LLMs, we recommend a recent report by UNESCO (2023a).

Key technologies in AI

Several technologies are central to AI. Below we have listed and briefly explained some of the more common ones:

- Natural Language Processing: machine-based analysis and understanding of human language
- Machine Learning and Deep Neural Network Learning models: the 'engines' of AI, these are systems that learn from vast amounts of data and improve over time
- Automated Speech Recognition and Speech-to-text: the processing and converting of speech into text
- Text-to-speech: the processing and converting of text into audio
- Text-to-video: the processing and converting of text into video (a recently emerged type of AI)

Where has GenAI come from?

Our human fascination with creating intelligent machine dates back many decades! The release of Chat-GPT in November 2022 felt like a one-of-a-kind innovation. The public accessibility of GenAI and its wide social acceptance make this an important moment in AI's evolution, but it is simply the **latest step in an ongoing evolution of AI**.

Good old-fashioned AI (1940s–1990s)

1940s:
Birth of the field of cybernetics by Norbert Wiener, which is the scientific study of control and communication in animals and machines

1950s:
Birth of the field of Artificial Intelligence with Alan Turing's paper 'Can Machines Think?' and the Dartmouth College, USA meeting, which investigated the extent to which human intelligence can be automated

1960s–1990s:
Development of 'expert systems' which used rule-based and statistical approaches to create programs showing expert behaviour, e.g. providing a medical diagnosis

1997:
IBM's Deep Blue beats the world chess champion

The rise of AI that can learn (2000s–present)

2000s:
Introduction of machine learning and neural networks. Unlike previous AI systems which could not learn, modern AI can continue to improve its performance as it learns from experience

2010s:
Breakthroughs in intelligent machine behaviors (e.g. Siri, Watson, Eugene, Alexa)

2017:
AlphaGo beats the world Go champion

Late 2010s:
Emergence of LLMs

2022:
Release of ChatGPT to the public

Commercial LLMs started to proliferate (we recommend a recent report by UNESCO (2023a) for more examples of GenAI tools based on LLMs)

What is the global educational context around AI and GenAI?

The rapidly shifting landscape of the use of GenAI in language education is unfolding in a global context where **reactions to educational technology and AI are polarised**. UNESCO, for instance, advocates for a global ban on smartphones in schools (2023b), which is reflected in policies across various countries. Another example can be seen in the recent government move in Sweden (The Guardian 2023) away from digital devices and back to paper-and-pencil in schools.

Meanwhile, some governments are proactively investing in AI-powered educational tools, such as digital textbooks and AI tutors, as seen in The Singapore Ministry of Education's National Artificial Intelligence (AI) Strategy and the implementation of AI use cases across schools in Singapore. Another example can be found in the active roll-out of AI tutoring in the United Arab Emirates (Gulf News 2023) and training for teachers on its use, and the plan for a wide rollout of digital textbooks in South Korea (Republic of Korea Ministry of Education 2023).

What are the key questions and principles around the use of GenAI in L2 education?

The diverse reactions to AI in education systems underscore the significant challenges that L2 teachers must navigate as they figure out how best to address their students' learning needs through tapping into the affordances of GenAI and avoiding the pitfalls.

Stakeholders in L2 education face three **key questions**:

1. When should GenAI be used in L2 learning, teaching and assessment?
2. When should GenAI *not* be used?
3. How can GenAI best augment teachers' and students' human intelligence?

We believe that these questions need to be underpinned by **five essential principles** that apply to all L2 education contexts that use GenAI:

1. **Clear policies need to underpin the use of GenAI.**
   Such policies need to explicitly and clearly address issues around safe and ethical use.

2. **The purpose of using GenAI needs to be well defined.**
   The key question facing educators is no longer whether something can be done by GenAI, but *why*.

3. **Principles of language learning need to be primary.**
   GenAI should be used when there is clear value for learning, and not just as an easy tech shortcut that happens to be available.

4. **Teachers need to be AI-ready in order to optimise the use of GenAI in their work.**
   They need professional development and upskilling to successfully use GenAI in their practice.

5. **L2 assessment needs to transform.**
   GenAI offers an opportunity to move from the traditional 'learn, stop, test' paradigm into an integrated learning and assessment paradigm which taps into the affordances of GenAI and is grounded in a communicative language approach.

We now turn to each of the three questions, addressing them through the prism of the key principles we've laid out.

When should GenAI be used in L2 learning, teaching and assessment?

GenAI tools offer intriguing and exciting opportunities to enhance language learning, teaching and assessment.

As a starting point in exploring those opportunities, it is useful to remind ourselves of the principles that underpin L2 learning. Broadly speaking, competence in an L2 is primarily enabled by developing 'implicit knowledge' (Ellis, 2004). This is knowledge which is automated and carried out unconsciously in our cognitive processes. It is generally believed that implicit knowledge is developed alongside 'explicit' knowledge, i.e. knowledge about the phonological, lexical, grammatical and pragmatic features of an L2 which learners are consciously aware of (Ellis, 1993). Certain conditions provide an optimal environment for the development of implicit and explicit knowledge in L2.

We learn languages best when:	L2 principles/conditions
• *We are exposed to frequent, relevant and comprehensible language input*	Rich language input
• *We use language through a focus on form and also meaning as part of real-life contexts*	Targeted and meaningful practice
• *We have opportunities to develop interactive speaking skills*	Interactive communication
• *We are exposed to language content which is not too easy or too difficult and is practised in free and controlled tasks*	Scaffolded learning
• *We have ongoing and regular evaluations providing us with information on what we can do and can't yet do*	Learning-oriented assessment
• *We receive feedback that we can use to improve and reach our learning goals*	Actionable feedback
• *Our individual needs are catered for in terms of L2 ability, personal interests, cultural considerations*	Individualised learning
• *We are engaged, motivated and challenged through engaging learning materials*	Individual differences and affective factors
• *We take responsibility for our own learning by continuously developing and tapping into our agency*	Autonomous learning

Source: Ellis (2005)

If thoughtfully implemented with a keen eye on safety and ethics, GenAI tools could add value to all these conditions for successful L2 development. The examples below provide illustrations of the use of GenAI which are currently available or future possibilities.

Example of GenAI use	Language learning activity
Conversational AI to support interactive and sustained speaking practice	• Interactive speaking practice can be done more frequently than just within a classroom • Machine-delivered speaking tests can be interactive (as opposed to monologic), supporting positive washback in the classroom
Automated immediate feedback to inform writing skills development (or other skills)	• A chatbot provides feedback on right and wrong language choices • Hints and tips are provided to scaffold further language practice
Visual and bite-sized support for listening development	• A range of listening input is created, providing different levels of support for learners • Learners can select the features of their listening tasks (based on their own choice or prompted by a chatbot), e.g. audio-only, audio and some visuals, full video, or speed-up/slow-down pace of audio
Varied task features for reading development to support leaners with different cognitive profiles	• Reading fluency can be developed through a range of reading texts which have different task features, e.g. time limits, display speed, text size, controlled scrolling • Easy access is available for dictionary look-ups and translations of parts of the reading texts
Ongoing smart assessment integrated within the learning process	• Regular checks on learning are done (sometimes invisibly in the background), through ongoing gathering of information from learning activities • The insights from these assessments are used to inform individualised learning pathways
Lesson plans on a specific learning goal are generated for teachers	• Draft lesson plans are generated and refined by the teacher • Variations on lesson plans and activities can be used for learners with different learning needs

There is a long tradition of research in AI in education (see for example du Boulay (2016) for a summary). Robust research about the ability of GenAI specifically to enhance learning (both in L2 contexts and more broadly) is also emerging. For example, personalisation tools that automatically adjust sequence, pace, feedback or learning path to adapt to individual learners have shown promise in general education research (Shemshack & Spector, 2020; Zheng et al., 2022); AI feedback has been shown to support learning (Godwin-Jones, 2022; Su et al., 2023); AI chatbots have been used as supportive partners in student learning (Chen et al., 2023). At the same time, we must be aware of the risk of over-personalisation through creating a simplistic 'Netflix of learning' through AI systems, and we mustn't lose sight of the importance of learner agency and teacher guidance (Markauskaite et al., 2022).

Regarding the impact on teacher workload, it is not always the case that new technology would make teachers' professional lives easier! Empirical insights are starting to emerge about the value of GenAI for teachers. For example, AI teaching assistants have been found to reduce teacher's workload by recommending suitable lesson plans (Celik et al., 2022). However, we must always remember that the teacher should have control of the learning decisions, although the degree of control will vary depending on the situation (US Department of Education, 2023). These findings are echoed in a research study carried out by Cambridge which focused on language teachers' uses and perceptions of GenAI.

What are the concerns and risks around GenAI?

Despite the exciting opportunities of GenAI in L2 education, significant limitations, concerns and risks remain. These concerns go beyond L2 education into education and society in general (UNESCO 2023a). We focus on several key concerns which we believe to be critical and which we need to mitigate against.

Ethical use

Policies and principles on using GenAI in education are paramount. With the fast pace of development of GenAI, policies for safe and principled use and appropriate guardrails are often lagging behind. Indeed, in a recent survey by Cambridge University Press & Assessment with L2 teachers, a question on what policies exist in the institutions of the surveyed teachers produced the largest proportion of responses (36%) as 'I don't know.'

Implications for L2 education: A number of key areas need to become **central considerations and guidelines for ethical GenAI policies** in L2 education:

- Transparency about the role of GenAI in learning and assessment is prioritised, including how risks are controlled
- Ensuring that there is always human input, which can be minimal or extensive, depending on the learning/assessment context
- Ensuring that diversity and equity have been central in developing GenAI tools and are maintained throughout the use of those tools
- Protecting the privacy and data of learners, test takers and other stakeholders
- Ensuring that any approach takes into account intellectual property and follows clear and ethical guidelines concerning development and use

For more information, we suggest this Cambridge paper on the use of GenAI in language education.

The potential to generate fabricated 'facts' and circulate AI-generated misinformation

GenAI can create inaccurate content and present it as if it is reliable, even to well-educated audiences. Digital 'hallucinations' is now a widely used term to refer to such inaccurate AI-generated content. (It was, in fact, chosen as the 2023 Cambridge Dictionary Word of the Year).

Implication for L2 education: Many students implicitly trust the accuracy of GenAI, and there's a danger of developing an over-reliance on Gen AI in education. **A critical approach to GenAI is fundamentally important in L2 education:** what can be trusted and what is not to be trusted? Teachers, therefore, need to explicitly focus on developing learner awareness around the trustworthiness of GenAI content. A useful practical example on ways to focus on the trustworthiness of AI content can be found in this webinar with a teacher in Sao Paulo, Brazil.

The risk of amplifying prejudice and biases

GenAI content is heavily dependent on the data used to train its models. And the output of those models may perpetuate problematic societal biases.

For example, in an experiment (Nicoletti & Bass, 2023) done in the United States with a GenAI text-to-image tool, the word 'judge' was used as the prompt for the GenAI model to generate images. It generated only 3% of images featuring women, when approximately 34% of US judges are women. In this case the GenAI model didn't just perpetuate bias, but intensified it.

Implication for L2 education: teachers and students need to question GenAI output! **Developing critical thinking skills in L2 education should become an essential area of focus**, alongside the L2-specific areas for learning.

The risk to assessment integrity

In many cases it is difficult to detect the output of GenAI models – is it generated by AI or by humans? Naturally this poses challenges for assessment since cheating can become undetectable. It also creates a unique challenge for L2 assessment and the use of AI-detection tools, since language by non-native English speakers could be disproportionately affected in a negative way. As Professor Ethan Mollick from the University of Pennsylvania, USA, noted in an article from 2023: 'A couple rounds of prompting remove the ability of any detection system to identify AI writing. And, even worse, detectors have high false positive rates, accusing people (and especially non-native English speakers) of using AI when they are not'.

Additionally, deepfakes are becoming increasingly easy to create on a massive scale, with face and voice generators creating material that seems authentic.

Implication for L2 education: While the increased potential for cheating is undoubtedly a central concern, **L2 education should evolve towards proactive transforming of assessment and not reactive policing of the use of GenAI tools**. We agree with Professor Danny Oppenheimer (2023), whose research focuses on human decision-making, and who argues in this article that 'the task now is to design assessment that incorporates AI-generated tests. Not least because upon graduation, students will be using this technology in the workplace.'

We believe that transformation of assessments needs to become a guiding principle in L2 education, with assessment tasks which are integrated with learning and tap into essential real-life skills and not just skills which can be easily delivered by machine. This also involves clear and collaborative classroom rules and discussions on the uses of AI and what counts as plagiarism. It is important to give voice to students and understand how they approach using GenAI.

Such a transformation would lead us to a nuanced approach to the use of GenAI in L2 assessment, with instances where *AI is not allowed* (similar to a Maths exam without a calculator), to instances where it is *encouraged for use as prep*, to cases where it is *discouraged*, and to the *required use of AI* (as in a Maths exam with a calculator).

A further implication is provocatively captured by Hamilton et al.: 'within a few very short decades, literacy skills may become as quaint as Latin and the Classics. ... Instead, oral communication may take on greater significance' (2023, working paper). This raises an interesting hypothetical question: Are L2 learners still going to be required to write essays in 5–10 years time? The transformation of L2 assessments would ensure that, even if essay writing is not used as a proxy for skills such as organising information in an L2, understanding the requirements of different genres or writing with a sense of audience, those skills will remain at the centre of L2 learning and assessment.

The 'black box' nature of GenAI models

An additional concern centres around the 'black box' nature of the available GenAI tools. This refers to limited transparency into how a GenAI model reaches its decisions. This is especially problematic when GenAI is entrusted to make high-stakes decisions, such as provide scores on an L2 exam.

Generally, the more sophisticated and accurate a GenAI model is, the more opaque and 'black box' it is. A key concept here is *explainability*, i.e. how easy it is to explain the reasons behind the AI output and decisions. Generally, AI models that are transparent and that are easier to understand are less accurate; the more powerful and accurate AI models become, the less explainable they are. Andrej Karpathy, summarised the explainability dilemma well: 'Across many applications areas, we'll be left with a choice of using a 90% accurate model we understand, or a 99% accurate model we don't' (Software 2.0, 2017).

Implication for L2 education: It is important to advocate for AI systems, both in learning and assessment, that **prioritise explainability and human involvement in the decision outcome**. It is also critically important to have a human-centred approach in L2 contexts, whereby human teachers are in charge of decisions based on AI recommendations, and human examiners provide decisions in tandem with machines.

Intellectual Property (IP) and copyright

The output created by GenAI systems comes across as newly created. It is, however, based on massive datasets which often contain works bound by intellectual property. Intellectual ownership of GenAI output is, therefore, a complex dilemma from a legal perspective, since the degree of transformation of the original into the newly created content is often difficult to quantify and define. Is GenAI output just 'high-tech plagiarism', as argued by Professor Chomsky in this interview?

Clearly this is not a black/white issue, and there are many layers of considerations that add to the complexity of dealing with it. Hamilton et al. (2023) provide an interesting perspective: 'If Einstein had been born in a cave 50,000 years ago, there is literally zero chance that he would have stumbled across the theory of general relativity – because he would not have been able to "plagiarise" the work of others. Except, of course, he was not actually plagiarising. He was synthesizing, extending, and enhancing an existing body of knowledge' (p. 13).

Implication for L2 education: raising student awareness about the IP and copyright issues inherent in GenAI is an important first step. A further step is the need to **exercise care when using copyrighted material** in GenAI prompts and promote ethical use.

Environmental impact

The topic of sustainability and environmental impact is no longer on the periphery of societal debates. It is, for example, central to the values of Generation Z (i.e. people roughly born between 1995 and 2010), as shown in this research by the World Economic Forum (2022).

The main concern around GenAI and environmental impact is the exceptionally high computing power needed for running GenAI systems, which translates into energy requirements and therefore carbon emissions. The two biggest environmental consequences of GenAI come from building and training LLMs, and from their routine use, i.e. user prompting and output generation. For example, a study by University College London noted that the training of GPT3 was estimated to have consumed 1,287 megawatt hours of electricity and generated 552 tons of carbon dioxide, which is the equivalent of 123 petrol cars driven for one year. As Caines et al. (2023) note in their in-depth discussion of the application of LLMs in L2 learning and assessment: 'as LLMs grow, so does their climate impact'.

Implication for L2 education: The topic of sustainability needs to become part of L2 curricula and be embedded throughout curricula and coursebooks in a systematic way. An example of how to approach this topic in a comprehensive and systematic manner can be found in the Cambridge Sustainability Framework for English Language Teaching (Blue 2022), which outlines four dimensions of relevance for L2 education and sustainability: knowledge, values, transformation and innovations.

A further implication is the importance of **understanding the type of AI model that is adopted, since different models have different carbon footprints**. For example, LLMs have a higher footprint than smaller language models (referred to as 'Baby Language Models'). The use of 'computationally efficient hardware and algorithms' (Strubell et al. 2019, p. 3,649) should be prioritised. Environmental impact should be considered when prompting LLMs, as mentioned in this Cambridge blog (Oliver 2024).

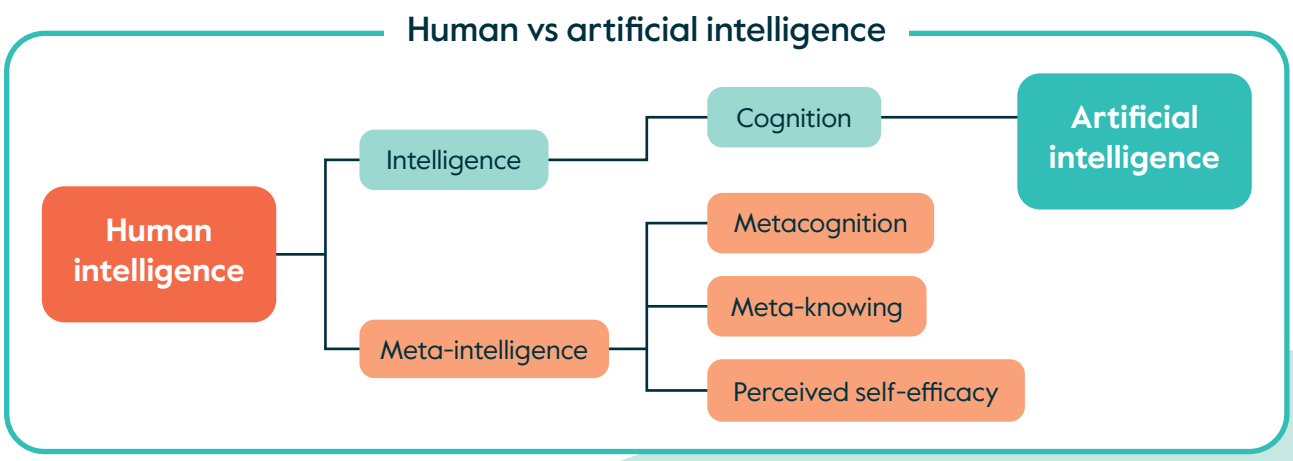
How can GenAI best augment teachers' and students' human intelligence?

With the breathtakingly fast advent of GenAI and hype around it, it is perhaps easy to lose sight of the fact that human intelligence and AI differ greatly and in important ways. GenAI can only replicate a small subset of the academic, social and meta-intelligence that defines human beings.

Influential conceptualisations of human intelligence by Gardner (1983) and Luckin (2018) embrace the multifaceted nature of human intelligence. For example, Luckin (2018, pp. 65–66) argues for different aspects of intelligence:

- **Academic intelligence:** Knowledge about the world. Knowledge and information are not the same.
- **Social intelligence:** Ability to engage in social interaction. Learning (of anything, including languages) takes place in social contexts, as convincingly argued by Vygotsky (1987) and by proponents of socio-cultural theory.
- **Meta-knowing intelligence:** Knowing about knowledge. An understanding of what knowledge is, what good evidence is and how to make judgements based on that evidence and the surrounding context.
- **Meta-cognitive intelligence:** Ability to regulate our mental activity.
- **Meta-subjective intelligence:** Emotional and knowledge and regulatory skills. This is the ability to recognise our emotions and the emotions of others and to regulate our emotions and behaviours with respect to other people.
- **Meta-contextual intelligence:** Understanding the environment around us.
- **Perceived self-efficacy:** The belief that we can succeed in specific (often challenging) situations. It requires an accurate, evidence-based judgement about our knowledge and understanding, our emotions and motivations, and our personal context.

We believe that **GenAI currently only contributes to academic intelligence, and has little to offer in the other areas of intelligence**. GenAI does not have knowledge or intelligence, only data and information. It cannot achieve human-level social interaction. It does not have meta-intelligence.



An understanding of the strengths and limitations of GenAI systems provides a useful foundation on which to build a successful approach to L2 education. Earlier in this paper we briefly overviewed the principles and conditions which support successful L2 learning and the potential of GenAI in supporting and augmenting many of those areas of learning.

There are, additionally, skills and knowledge which become even more important in the era of GenAI. They relate to skills such as communication, collaboration and critical thinking. The Cambridge Life Competencies Framework provides a valuable systematic and comprehensive approach to those skills.

These competencies are echoed in more recent conceptualisations about 'life skills', as seen, for example, in the top 10 skills of 2025 outlined by the World Economic Forum:

Top 10 skills of 2025

Type of skill

- Problem-solving
- Self-management
- Working with people
- Technology use and development

Analytical thinking and innovation

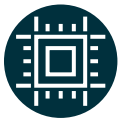
Active learning and learning strategies

Complex problem-solving

Critical thinking and analysis

Creativity, originality and initiative

Leadership and social influence



Technology use, monitoring and control

Technology design and programming

Resilience, stress tolerance and flexibility

Reasoning, problem-solving and ideation

Source: Adapted from Future of Jobs Report 2020, World Economic Forum.

How can we stay ahead of GenAI?

We end our discussion with a reiteration of our firm belief that using GenAI in L2 education and education more broadly is not just about having powerful technology and lots of data. Clear implications for L2 education emerge:

- A **human-centred approach** to using GenAI is even more paramount now, providing teachers and students with opportunities to use GenAI in a way that allows them to go deeper and wider into learning and strengthen their uniquely human skills.
- GenAI has to be **used with a clear purpose** so that it leads to positive outcomes and substitutes or augments the teacher in contexts where that's relevant.
- GenAI needs to be used in **alignment with the cognitive, social and emotional aspects** of L2 learning.
- Students, teachers and other L2 education stakeholders need **enhanced AI literacy skills** to effectively use GenAI tools and critically approach AI-produced content. That involves an understanding of the risk of over-reliance on GenAI models in terms of devaluing human creativity, critical thinking, and the social-emotional skills essential for learners' development.
- In L2 learning and assessment a priority must be cultivating individuals' metacognitive skills and higher-order thinking abilities to **augment the strengths of AI while retaining uniquely human aptitudes** like sophisticated reasoning, creativity, and abstract thought.

As the prominent philosopher and educationalist John Dewey noted, 'You cannot teach today the same way you did yesterday to prepare students for tomorrow'. We believe that with proper governance and preparation, teachers could empower learners to adapt and thrive in the new era of GenAI, making the education of the learners of today and tomorrow dramatically more equitable and enriching.

References

Barrett, M. et al. (2019). Using Artificial Intelligence to Enhance Educational Opportunities and Student Services in Higher Education. *Inquiry: The Journal of the Virginia Community Colleges*, 22 (1). https://commons.vccs.edu/inquiry/vol22/iss1/11

Bhatnagar, S. et al. (2018). Mapping intelligence: requirements and possibilities. In: V. Muller (ed.), *Philosophy and Theory of Artificial Intelligence 2017. PT-AI 2017* (pp 117–135). Studies in Applied Philosophy, Epistemology and Rational Ethics Volume 44. Springer International Publishing.

Blue, J. (2022). *Introducing the Sustainability Framework for ELT: free activity cards.* https://www.cambridge.org/elt/blog/2022/09/30/sustainability-framework-elt-activity-cards/

Caines, A. et al. (2023). *On the application of Large Language Models for language teaching and assessment technology*. https://arxiv.org/pdf/2307.08393

Celik, I. et al. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: A Systematic Review of Research. *TechTrends*, *66*, 616–630. https://doi.org/10.1007/s11528-022-00715-y

Chen, Y., Jensen, S., Albert, L.J. et al. (2023). Artificial Intelligence (AI) Student Assistants in the Classroom: Designing Chatbots to Support Student Success. *Information System Frontiers*, *25*, 161–182. https://doi.org/10.1007/s10796-022-10291-4

du Boulay, B. (2016). Recent meta-reviews and meta-analyses of AIED systems. *International Journal of Artificial Intelligence in Education*, *26*(1), 536–537. http://dx.doi.org/10.1007/s40593-015-0060-1

Ellis, R. (1993). Second language acquisition and the structural syllabus. *TESOL Quarterly*, *27*, 91–113.

Ellis, R. (2004). The definition and measurement of explicit knowledge. *Language Learning*, *54*, 227– 275.

Ellis, R. (2005). Principles of instructed language learning. *System, 7.* 209–224. 10.1016/j.system.2004.12.006

European Commission. (2018). *The European Commission's High-level Expert Group on Artificial Intelligence.* https://ec.europa.eu/futurium/en/system/files/ged/ai_hleg_definition_of_ai_18_december_1.pdf

Gardner, H. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. Basic Books.

Godwin-Jones, R. (2022). Partnering with AI: Intelligent writing assistance and instructed language learning. *Language Learning & Technology*, *26*(2), 5–24. http://doi.org/10125/73474

Gulf News. (2023, 2 March). *UAE's Ministry of Education to train teachers on AI tutoring.* https://gulfnews.com/uae/uaes-ministry-of-education-to-train-teachers-on-ai-tutoring-1.94190539#:~:text=Dubai%3A%20The%20UAE%20Ministry%20of%20Education%20is%20pushing,will%20be%20incorporated%20in%20schools%20across%20the%20Emirates

Hamilton, A., Wiliam, D., & Hattie, J. (2023). *The future of AI in Education: 13 things we can do to minimise the damage*. Hamilton Wiliam and Hattie 2023 – Final 1 2.pdf (chameleon-training.co.uk)

Jacobs, J., Scornavacco, K., Harty, C., Suresh, A., Lai, V., & Sumner, T. (2022). Promoting rich discussions in mathematics classrooms: Using personalized, automated feedback to support reflection and instructional change. *Teaching and Teacher Education*, *112*, 1–13. https://doi.org/10.1016/j.tate.2022.103631

Karpathy, A (2017). *Software 2.0.* https://karpathy.medium.com/software-2-0-a64152b37c35

Luckin, R. (2018). *Machine Learning and Human Intelligence: The future of education for the 21st century.* UCL IOE Press.

Markauskaite, L. et al. (2022). Rethinking the entwinement between artificial intelligence and human learning: What capabilities do learners need for a world with AI?. *Computers and Education: Artificial Intelligence*, *3*, 100056.

Mollick, E. (2023). *The Homework Apocalypse*. https://www.oneusefulthing.org/p/the-homework-apocalypse

References

Nicoletti, L., & Bass, D. (2023). *Humans are Biased. Generative AI is Even Worse.* https://www.bloomberg.com/graphics/2023-generative-ai-bias/

Oliver, S. (2024). *AI prompt writing for ELT Teachers: 7 ingredients of a successful prompt.* https://www.cambridge.org/elt/blog/2024/03/09/ai-prompt-writing-for-elt-teachers-7-ingredients-of-a-successful-prompt/

Oppenheimer, D. (2023). *ChatGPT has arrived – and nothing has changed.* https://www.timeshighereducation.com/campus/chatgpt-has-arrived-and-nothing-has-changed

Republic of Korea Ministry of Education. (2023). *Briefing on the plan for AI digital textbooks.* https://english.moe.go.kr/boardCnts/viewRenewal.do?m=0202&s=english&page=2&boardID=254&boardSeq=95291&lev=0&opType=N

Shemshack, A., & Spector, J.M. (2020). A systematic literature review of personalized learning terms. *Smart Learning Environments*, *7*, 33. https://doi.org/10.1186/s40561-020-00140-9

Strubell, E., Ganesh, A., & McCallum, A. (2019). Energy and policy considerations for deep learning in NLP. In: *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics, Florence, Italy, 2019*. https://aclanthology.org/P19-1355/

Su, Y., Lin, Y. &, Lai, C. (2023). Collaborating with ChatGPT in argumentative writing classrooms. *Assessing Writing*, *57*. https://doi.org/10.1016/j.asw.2023.100752

The Guardian. (2023, 11 September). *Switching off: Sweden says back-to-basics schooling works on paper.* https://www.theguardian.com/world/2023/sep/11/sweden-says-back-to-basics-schooling-works-on-paper

UNESCO. (2023a). *Guidance for generative AI in education and research.* https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research

UNESCO. (2023b). *Smartphones in school? Only when they clearly support learning.* https://www.unesco.org/en/articles/smartphones-school-only-when-they-clearly-support-learning

US Department of Education. (2023). *Artificial Intelligence and the Future of Teaching and Learning*. *Insights and Recommendations*. https://www2.ed.gov/documents/ai-report/ai-report.pdf

Vygotsky, L. S. (1987). *The collected works of L. S. Vygotsky, Vol. 1. Problems of general psychology*. (R. W. Rieber & A. S. Carton, Eds.). Plenum Press.

World Economic Forum. (2022). *Gen Z cares about sustainability more than anyone else – and is starting to make others feel the same.* https://www.weforum.org/agenda/2022/03/generation-z-sustainability-lifestyle-buying-decisions/

Zheng, L. et al. (2022). The effectiveness of technology-facilitated personalized learning on learning achievements and learning perceptions: a meta-analysis. *Education & Information Technologies*, *27*, 11,807–11,830. https://doi.org/10.1007/s10639-022-11092-7

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