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As historian Larry Cuban argues, **education is not just complicated but complex. It is an interlocking system of learners, educators, technologies, and broader social contexts, with all kinds of invisible linkages and unexpected consequences. Trying to accelerate learning by ramping up technology is like putting rockets on butterfly wings. More force does not lead linearly to more progress.**

Justin Reich (2020), *Failure to Disrupt*

2

Improvements in education very rarely, perhaps never, come by way of dramatic transformations. They come through deep, long-term commitment to the plodding work of building more robust systems ...

New technologies get introduced into complex learning ecologies, and those **complex learning ecologies require multiple changes at multiple levels to take advantage of new technologies ...** changes in educational systems are necessarily incremental, but **step change** is what continuous, incremental change looks like from a distance.

Justin Reich (2020), *Failure to Disrupt*

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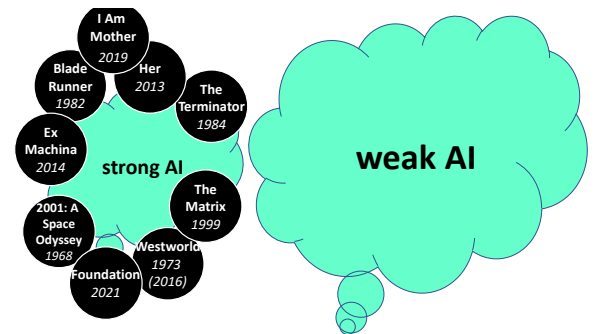
In line with teachers canvassed in our survey, the majority of interviewees saw **the future as one of continuity rather than widespread disruption of educational systems.** This is because AI was seen to be able to do some of the things that humans do, but not everything that a good teacher does.

Adam Edmeitt, et al. (2023), *Artificial Intelligence and English Language Teaching*

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AI technology

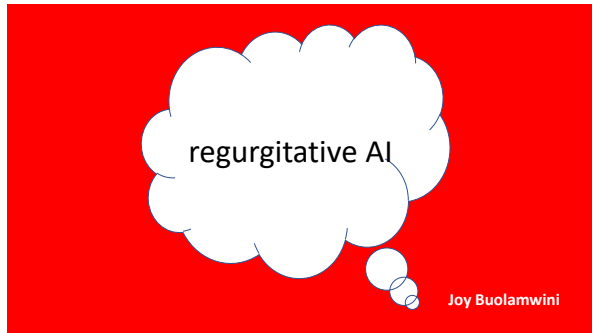
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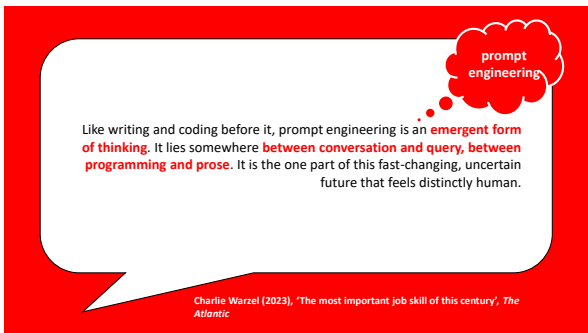


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Joy Buolamwini



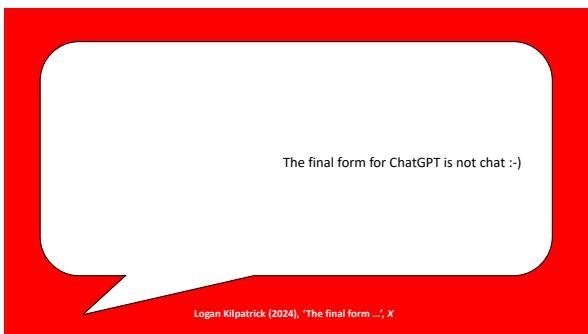
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Charlie Warzel (2023), 'The most important job skill of this century', *The Atlantic*



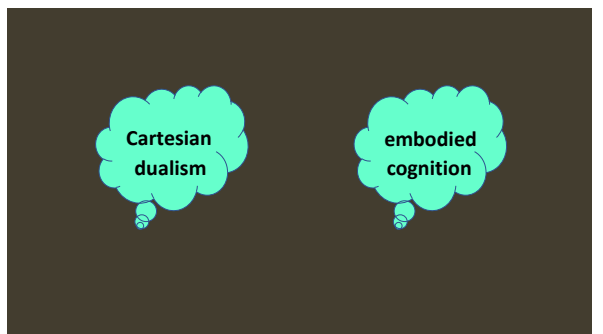
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Matt Bell, Anthropic, cited in James Purtill (2023), 'Prompt engineers share tips -', *ABC News*



11

Logan Kilpatrick (2024), 'The final form ...', *X*



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AI in education

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Students can ask generative AI to ...

- explain learning points (e.g., scientific principles, grammar rules, historical events)
- provide examples of words, phrases or structures in use
- find and summarise existing texts
- produce first drafts of essays and titles
- improve the grammar, vocabulary and style of texts
- co-generate stories in a choose-your-own-adventure style
- offer feedback on texts
- create self-study revision questions
- engage in conversation (including role plays) in multiple languages
- take on the role of a teacher or Socratic tutor
- take on the role of a student (with students acting as teachers)

Source: Pegrum, M. (2024).
Generative AI, Digital Learning
bit.ly/3j0t0RK (23 Jan 2024)

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Teachers can ask generative AI to ...

- create lesson plans
- create teaching materials and handouts
- devise assessments and rubrics
- draft model assignments
- generate responses with specifically planned flaws for students to identify
- generate multiple responses to a question (which students may critique)
- provide a first draft of feedback on student work (which students may critique)
- analyse student data to improve teaching/learning
- draft student reports based on teachers' notes
- draft meeting summaries based on notes
- draft official documents based on notes

Source: Pegrum, M. (2024).
Generative AI, Digital Learning
bit.ly/3j0t0RK (23 Jan 2024)

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ChatGPT: Language Teacher Uses (Aim & Ohashi, 2024)

- **Reading:** Generate reading passages or texts on different topics and levels of difficulty
- **Writing:** Generate templates for different types of writing, such as an essay, a letter, or a report
- **Conversation:** Generate scripts for role-playing activities
- **Quizzes and tests:** Generate quizzes and tests on different language skills, such as vocabulary, grammar, reading comprehension, and listening
- **Games:** Generate language learning games such as crossword puzzles, word searches, and hangman games
- **Grammar:** Generate worksheets with grammar rules, examples, and exercise
- **Vocabulary:** Generate flashcards with vocabulary words and their definitions, translations or synonyms

Source: Aim, A., & Ohashi, L. (2024). A worldwide study on language educators' initial response to ChatGPT. *Technology in Language Teaching & Learning*, 6(1), 1-23. DOI: 10.29140/tltl.v6n1.1141

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... these detectors are not reliable in practical scenarios ... as language models become more sophisticated and better at emulating human text, the performance of even the best-possible detector decreases.

Vinu Sanjay Sadasivan, et al. (2023), 'Can AI-generated text be reliably detected?', arXiv

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Although text matching software also suffers from false positives and false negatives (Foltýnek et al. 2020), at least it is possible to provide evidence of potential misconduct. In the case of the detection tools for AI-generated text, this is not the case.

Our findings strongly suggest that the 'easy solution' for detection of AI-generated text does not (and maybe even could not) exist.

Deborah Weber-Wulff, et al. (2023), 'Testing of detection tools for AI-generated text', *International Journal for Educational Integrity*, 19

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Work from individuals with ASD and non-native English speakers was more likely to be flagged than actual AI generated content. ...

To employ AI detection tools at their current point of development is to risk incorrect allegations of AI plagiarism, likely directed at certain learner demographics more commonly than others ...

Anthology (2023), AI, Academic Integrity, and Authentic Assessment

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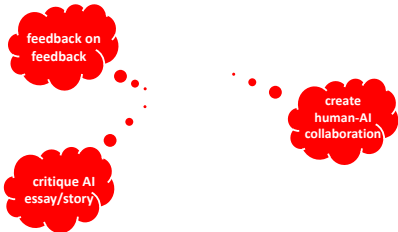
Support for Learners with Special Needs

- Conversational diagnosis of learning difficulties
- AI-powered accessibility tools
- Generative amplifier for marginalized users

Source: Miao, F., & Holmes, W. (2023). Guidance for generative AI in education and research. UNESCO. [rebrand.ly/donma0](https://doi.org/10.24646/2023) (14 Dec 2023).

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Generative AI: Assessment



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Microsoft New Future of Work Report (2023)

Complementarity is a human-centered approach to AI collaboration

Humans and AI can “collaborate” in many ways: from each party acting as a collaborative team member, to a person overseeing an AI automation loop, to AI simulating a human.

Source: Butler, J., et al. (Eds.). (2023). Microsoft New Future of Work Report 2023. [rebrand.ly/0h4kqz](https://www.microsoft.com/en-us/work)

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IA
(intelligence augmentation)

Frank Pasquale

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co-intelligence

Ethan Mollick

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AI issues

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individualisation

AI ...

- limits **personal connection**
- limits **personal agency**
- limits **personal integrity**

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Creating one AI generated image uses as much electricity as fully charging your smartphone

AI for Education (2023), AI's Impact on the Environment

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For 5-50 responses, GPT-3 'drinks' half a litre of water

Pengfei Li et al. (2023), Making AI less 'thirsty', arXiv

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environmental racism

... AI technology is an environmental disaster in the making; the planet cannot be paved with datacentres.

John Naughton (2024), 'From boom to burst ...', The Guardian

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Green IT

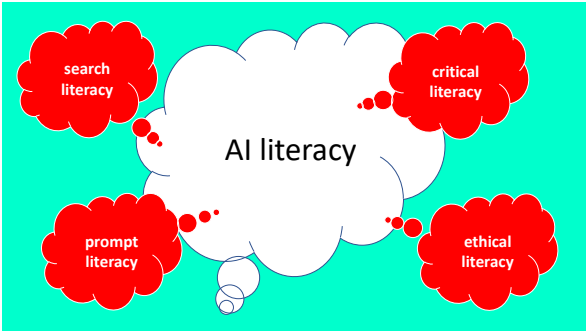
Computing within Limits

Ed-Tech within Limits
(Neil Selwyn)

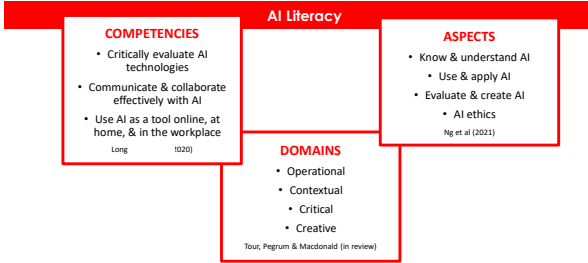
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AI literacy

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bit.ly/3JrdGRK

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