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A conceptual framework for discussing the human–AI writing continuum

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A conceptual framework for discussing the human-AI writing continuum

The purpose of this note is to present a possible conceptual framework for discussing the human-AI writing continuum, from no AI use at all to entirely AI written. This continuum is presented to help inform educators' thinking around what level of AI use might be pedagogically desirable for any given written assessment task, given the learning goals of the task.

Motivating context

The recent public release of large language model (LLM) generative AIs, such as [ChatGPT](#), are posing two urgent concerns in universities. On the one hand, there are concerns around academic integrity – how can we know how much students are learning if LLMs can pass both exams and written assignments in virtually any discipline? On the other hand, there is also a need for educators to develop students' AI literacy in order to prepare them for their future careers where expertise in the use of generative AI tools will be expected. For an entree into these issues, see the Tertiary Education Quality and Standards Agency's ["Artificial Intelligence" page](#) in their higher-education-good-practice-hub.

Introducing the human-AI writing continuum

To address both the concerns mentioned above, all assessment tasks need to have high human involvement and varying levels of AI involvement, from none at all to potentially a generative AI tool being used by students as a co-creator.¹ Since early discussions around these issues have tended to focus on two extremes – namely banning any generative AI use at all to ensure academic integrity, to concerns students will use a generative AI tool to do everything – a more nuanced approach is needed if the dual goals of maintaining academic integrity and developing students' AI literacy are to be achieved. Since varying the level of AI use which is acceptable for a given assessment task will be needed to achieve different learning goals, there is a need for a framework which describes the different levels of AI use that are possible when working on written assessments. To that end, based on my own experiments with ChatGPT, reflections on the writing process, and the experiences reported by others, I finalised the "human-AI writing continuum" conceptual framework described in [Table 1](#) below in early March 2023 when it was then circulated among the members of the [Association for Academic Language and Learning](#). It also appeared in a [Call for submissions to a special section in JALL on the challenges and opportunities posed by generative AI for universities and ALL work](#) on 10 May, 2023.

Related works

Parallel and subsequent to this work, other educators have developed similar descriptions of the human-AI writing continuum which may provide alternative perspectives which may be of interest. These models include:

1. Matt Miller (December 17, 2022): [How to define "cheating" and "plagiarism" with AI.](#)
2. John Spencer (February 20, 2023): [The Future of Writing in a World of Artificial Intelligence #ChatGPT](#)
3. Leon Furze (n.d.): [AI Assessment Scale: From no AI to full AI.](#)

Acknowledging AI use

A key element of academic integrity is the acknowledgement of the significant² sources of help that were used to create a piece of writing. In relation to *how* to acknowledge the use of generative AI in the creation of a piece of writing, a thorough guide is provided in the [University College London's resources](#) and the [UQ Library guide](#). See also the discussions in [The Future of Writing in a World of](#)

¹ For a more extensive discussion of these issues, see: Liu, D., & Bridgeman, A. (June 8, 2023). [ChatGPT is old news: How do we assess in the age of AI writing co-pilots?](#) *Teaching@Sydney*, and Mollick, E. (February 17, 2023). ["My class required AI. Here's what I've learned so far"](#).

² "Significant" does not include, for example, standard spell-checkers built into modern word processing software.

[Artificial Intelligence #ChatGPT by John Spencer](#) (February 20, 2023), and [My class required AI. Here's what I've learned so far](#) (Mollick, February 17, 2023). Since it is important to reinforce for students the importance and necessity of them being accountable for the work that they submit, the [Elsevier requirement](#) for authors to declare that, "After using this tool/service [i.e. a generative AI tool], the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication," seems to also be an important acknowledgement for students to make.³

The human-AI writing continuum

Table 1. A possible approach to classifying the varying levels of the human-AI writing continuum.⁴

| | Level |
|--|---|
| <div> <div>“Entirely” human written.</div> <div>↑</div> <div>↓</div> <div>Entirely AI written</div> </div> | 1. Student does things in the traditional way: All topic analysis, reading, note-taking, planning, writing and editing done solely by the student. Only AI use is word processor's built-in spell and grammar checking. |
| | 2. As per level 1, but student also uses Grammarly or a paid proofreader to correct and refine what they have written. No refinements add anything of substance to the student-generated text. |
| | 3. As per level 1, but ChatGPT is asked for feedback on how the student written text can be improved / clarified / simplified and/or ChatGPT is asked for feedback on how well student-written text meets writing assessment criteria such as completeness of argument. Student adopts or adapts recommended changes. |
| | 4. Student asks ChatGPT to analyse the assignment topic, i.e. to generate sub-topics / sub-questions to consider when addressing the assigned topic and/or asks ChatGPT to provide a possible outline for the assignment in the form of points to make / sub-topics to address / questions to answer. Student adopts or adapts the proposed plan but then does all required researching and writing themselves. |
| | 5. Based on a plan or outline either generated by themselves or adopted/adapted from ChatGPT, student does all the required research and takes structured and referenced notes within the skeleton of the plan. ChatGPT is asked to convert (some of) the structured notes to properly cited paragraphs which the student then adopts or adapts. |
| | 6. When note-taking from sources, an AI is asked to paraphrase text copied and pasted from the source. The student then uses these paraphrases to construct their assignment, either using them without modification or synthesising and expanding on them as they would with notes taken by themselves. |
| | 7. Student has a “conversation” with an AI about a topic, refining their question prompts based on their assessment of the AI's responses, then identifies the best responses and compiles and edits these as needed. Any necessary fact-checking is completed by the student using “traditional” methods. |
| | 8. Student refines / edits / adjusts / adds to a response to a prompt generated by an AI. A limited example of this level is asking an AI to suggest titles for a student-written essay or abstract. A more extensive example could include asking an AI to suggest a possible abstract in response to excerpts from a research paper. |
| | 9. Student adopts without change, a piece of writing generated by an AI in response to a prompt. |

³ This recent case: [“A lawyer used ChatGPT and now has to answer for its bogus \[case\] citations”](#) (Davis, May 28, 2023) may provide a salutary lesson to students about the importance of taking this responsibility seriously.

⁴ Table developed by D.R. Rowland. Version as at 10/3/23.