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FORUM

ChatGPT is likely reducing opportunity for support, friendship and learned kindness in research

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Abstract

1. Large language models (LLM) have proved to be highly popular since the release of ChatGPT, leading many researchers to explore their potential across multiple fields of scientific research. In a recent Perspective, Cooper et al. (2024) highlight a set of benefits and challenges for the use of LLMs in ecology, emphasising their value to coding in research and education.
2. While we agree that the ability of LLMs to assist in the coding process is remarkable, researchers should be conscious that this capability is likely changing the lived experience of primarily computational researchers, especially early career ecologists between Masters and Postdoctoral career stages.
3. In particular, since the release of ChatGPT, the authors of this paper have noticed a marked reduction in the frequency of social interactions emergent from coding and statistics queries. These questions are highly likely still being asked, but now often exclusively to a LLM.
4. Further research is needed to fully understand the effect of LLMs on the lived-experience of researchers and students. For primarily computational researchers, ChatGPT is likely reducing emergent opportunity for support, friendship and learned kindness. Group leaders should recognise this and foster deliberate within-group communication and collaboration.

KEYWORDS
ChatGPT, computational research, ecology, large language models (LLMs), mental health, pastoral support

Large language models (LLM) have proved to be highly popular since the release of ChatGPT in March 2023, leading many researchers to explore their potential for a variety of tasks across multiple fields of scientific research, including in ecology and evolution. In a recent Perspective, Cooper et al. (2024) highlight a set of benefits and challenges for the use of LLMs in ecological research, emphasising their value to coding in research and education.

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While we agree that the ability of LLMs to assist in the coding process is remarkable, researchers should be conscious that this capability is likely changing the lived experience of primarily computational researchers, especially early career ecologists between Masters and Postdoctoral career stages. Prior to ChatGPT, Masters' students with a coding or statistics query would typically approach more experienced PhD students or Postdocs in person, or via an online forum (e.g. Slack or Teams). PhD students and Postdocs often have more time, meaning they can provide help where a principal investigator might not—either because they lack specific domain knowledge or are too busy. Post COVID-19 but prior to ChatGPT, a significant proportion of these coding interactions shifted online, but nevertheless would still occur. Although currently anecdotal, since the release of ChatGPT, the authors of this paper have noticed a marked reduction in these coding interactions. Coding and statistics questions are highly likely still being asked, but more often exclusively to a LLM. StackOverflow has experienced a similar phenomenon, with a significant reduction in questions posted (del Rio-Chanona et al., 2023).

Cooper et al. (2024) write that 'students may be happier to ask chatbots for help than to ask a human instructor, out of fear that the latter will judge them harshly for not knowing the answers to simple questions'. Sadly, this is likely true for many students. But as a group of authors that thrive on supporting and social interaction, our experience has been that when early career researchers are treated with respect, they typically learn that it is ok to ask simple questions. Our concern is that if students are not given the opportunity for positive social interactions with fellow researchers, we will develop individuals who lack the confidence to question their mentors, and who fail to develop the social skills and relationships necessary for their lives and careers. This may be especially difficult for students who already struggle to fit into the academic space, such as those that are first-generation academics, neurodivergent, from underrepresented and/or marginalised backgrounds, or identify with some protected characteristic. For computational research groups, the magnitude of this effect of LLMs will likely relate to group structures and cultures, such as group size, the physical distribution of researchers post COVID-19, career stages and leadership style.

Further research is needed to fully understand the effect of LLMs on the lived-experience of primarily computational researchers and students. In the interim, we make two suggestions. First, group leaders need to acknowledge that trust, friendship, learned kindness and mutual respect are likely affected by an over-reliance on LLMs in research, and that social interaction is not just enriching to academia (Read et al., 2016), but should be central to it. Second, given the potential effects of ChatGPT on reducing organic collaboration, group leaders should show deliberate intent in facilitating connection between researchers that report to them, irrespective of the ways in which LLMs can also be beneficial. Deliberate intent could involve in person or online meet ups in the form of social gatherings (e.g. tea or coffee breaks), journal clubs, coding clubs (Hagan et al., 2020), group problem-solving sessions or live pair-programming (e.g. Visual Studio Live Share; Microsoft, 2024). LLMs could be used to facilitate rather than hinder this collaboration. For example, given natural language is effectively an additional abstraction from machine code (i.e. machine code → C → Python → natural language), researchers could discuss algorithms in a more abstract sense, and then explore how ChatGPT converts natural language to a given programming language. Researchers will learn that the ambiguity of an algorithm in natural language maps directly onto that algorithm in code. Conventionally researchers use ChatGPT to answer coding questions (Cooper et al., 2024), but ChatGPT is just as good at asking coding questions. Groups could use LLMs to generate coding problems in natural language, then work together to solve that problem and then return to ChatGPT for a solution in that same programming language, and then importantly, take the time to understand the solution provided by ChatGPT.

Technologies change the way individuals behave. This in turn feeds back on the skills we gain and the way we interact with the world. The invention of writing affected the way individuals and societies remember (Ong & Hartley, 2013); textile mechanisation helped concentrate populations into industrial cities (Chapman, 1990); satellite navigation affects our ability to orient in the world (Dahmani & Bohbot, 2020). For some technologies, we can isolate and understand their immediate term consequences, such that our judgement on the reasonability of its use becomes only a function of its convenience. The issue is technologies that change behaviour in detrimental ways we do not anticipate. LLMs may yet prove to be one such technology. For primarily computational researchers, LLMs are likely reducing emergent opportunity for support, friendship and learned kindness. Group leaders should lean into this consequence and foster deliberate within-group collaboration.

AUTHOR CONTRIBUTIONS

Joseph Millard conceived the idea and drafted an initial manuscript. Alec P. Christie, Lynn V. Dicks, Justin E. Isip, Thomas F. Johnson, Grace Skinner and Rebecca Spake all edited and approved the final version.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

This manuscript does not contain any data or code.

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REFERENCES

Chapman, S. D. (1990). *The cotton industry in the industrial revolution*. Macmillan Education UK.

Cooper, N., Clark, A. T., Lecomte, N., Qiao, H., & Ellison, A. M. (2024). Harnessing large language models for coding, teaching, and inclusion to empower research in ecology and evolution. *EcoEvoRxiv*.

Dahmani, L., & Bohbot, V. D. (2020). Habitual use of GPS negatively impacts spatial memory during self-guided navigation. *Scientific Reports*, *10*, 6310.

del Rio-Chanona, M., Laurentsyeva, N., & Wachs, J. (2023). Are large language models a threat to digital public goods? Evidence from activity on stack overflow. *arXiv preprint arXiv:2307.07367*.

Hagan, A. K., Lesniak, N. A., Balunas, M. J., Bishop, L., Close, W. L., Doherty, M. D., Elmore, A. G., Flynn, K. J., Hannigan, G. D., Koumpouras, C. C., & Jenior, M. L. (2020). Ten simple rules to increase computational skills among biologists with Code Clubs. *PLoS Computational Biology*, *16*(8), e1008119.

Microsoft. (2024). *Visual studio live share: Real-time code collaboration tool*. https://visualstudio.microsoft.com/services/live-share/

Ong, W. J., & Hartley, J. (2013). *Orality and literacy*. Routledge.

Read, E. K., O'Rourke, M., Hong, G. S., Hanson, P. C., Winslow, L. A., Crowley, S., Brewer, C. A., & Weathers, K. C. (2016). Building the team for team science. *Ecosphere*, *7*(3), e01291.

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