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February 5, 2024

AAIA organizing committee:

We wish to submit a revised version of the anonymous short paper submitted and accepted for the AI for Education Workshop, with the title: **Diagram-based Input for Large Language Models to Support Accessible STEM Learning**,

We confirm that this work is original and is not currently under consideration for publication elsewhere. We have submitted an early version of the manuscript to the pre-print service, ChemRXIV, and it is available at this link.

The authors wish to thank the reviewers for comments on the initial draft of the manuscript. Their comments led to a statement at the end of the manuscript with respect to future development and more extensive research beyond the four screen reader users who participated in the initial usability study.

With respect to the first reviewer's question about whether LLMs could directly compose the alt text, our answer is yes, and that is the subject of future research.

As we mention in the paper, the current automatically generated alt text to describe STEM images may meet accessibility standards but is not detailed enough to be pedagogically useful for a screen reader user. Detailed and precise descriptions are necessities for screen reader users to build accurate mental visual models of STEM content. That is why, for the initial pass, we generated automatic alt text without using LLMs. It is our goal, and part of our future work, to incorporate computer vision and LLMs to be able to automatically generate sufficiently detailed alt text for these STEM diagrams using AI.
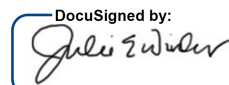
Other changes to the previously submitted paper include a detailed acknowledgement section and a financial conflict of interest statement, as all authors are employees of Alchemie Solutions, Inc, the producer of the Lewis Structure learning interactive described in the manuscript.

All authors have participated in the writing and subsequent review of this manuscript.

We look forward to participating in and learning from others at the AI4Ed conference in Vancouver next month.

Please address all correspondence concerning this manuscript to me at julia@alchem.ie

Sincerely,

DocuSigned by:

Julia E Winter

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Julia Winter

Principal Investigator