



What Kind of Mathematics Teacher is ChatGPT? Identifying the Pedagogical Practices Preferred by Generative AI Tools When Preparing Lesson Plans

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Generative AI (GenAI) tools (e.g., ChatGPT) have the potential to revolutionise teaching and learning through their capacity to generate a range of text types in moments. We posit that teachers might choose to use GenAI to develop lesson plans efficiently before critiquing and refining them for use in class. We see teachers as experts in selecting instructional materials, choosing resources based on their alignment with their goals for the lesson, experience and teaching preferences. However, GenAI tools may be likened to a ‘black box’ where users cannot see or understand how outputs were generated, thus potentially making it difficult to identify the pedagogies that informed a lesson plan. This paper reports a preliminary attempt to identify the preferred pedagogical practices of ChatGPT.

We used ChatGPT to prepare four lesson plans on the division of fractions. We analysed both the structure of the lessons (using headings within the lesson plans) and coded the text of the lesson plans using a set of 15 essential terms from the Australian Lexicon (Mesiti et al., 2021). Despite slight differences in structure, lesson plans followed a similar pedagogical approach: introduce key procedures or concepts, demonstrate key steps and skills through worked examples, and set problems for students to complete. The ‘division of fractions’ was illustrated with the ‘invert and multiply approach’ without any meaningful representation. While this approach may be suitable in some contexts, it reflects a view of mathematics teaching as the traditional ‘telling’, stating of information or demonstrating of procedures (Smith, 1996); rather than developing deep thinking, reflection and justification by students. While several practices aligned with evidence-based approaches for teaching (e.g., setting objectives, demonstrating, modelling, questioning; State of Victoria, 2017), these practices were general and did not incorporate evidence-based approaches that support the learning of division of fractions (e.g., bar models; Yeap, 2011). The absence of such approaches, specific examples, explanations, and problems, highlights the expertise needed by teachers to refine and implement lesson plans created by GenAI tools. In the case of lesson plans generated by ChatGPT, we found advice is provided for teachers on *what* to teach, but not *how* to teach it.

References

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