When GenAI Becomes a Teaching Assistant:

Bridging Foundational Gaps in Teacher Education

Michelle Hock

University of Virginia

For several years, I have been teaching a course to pre- and in-service teachers that helps them learn about and implement various instructional strategies in their own K-12 classrooms. Because the course aims to support students in improving their real-world teaching work, our major course assessments are authentic in nature, requiring students to develop lesson plans that they can use in K-12 contexts. Effectively designing lesson plans, however, requires my students to synthesize a range of knowledge, skills, and conceptual understandings – many of which are not part of our course syllabus. Yet, in order to succeed in creating lesson plans (and therefore, in the course more generally), students need to possess and demonstrate evidence-based lesson-planning competencies. For instance, prior to selecting and implementing effective instructional strategies – a key objective in our course – students must first be able to unpack standards, write clear learning goals that focus on thinking skills, and understand the levels of cognitive rigor inherent to a given task. Only then can my students move on to select instructional strategies that would support K-12 learners in reaching the desired learning goals.

In my first semester of teaching this course, I presupposed that all of my students would possess this background knowledge and have already fine-tuned their skills in writing learning goals that targeted various degrees of cognitive rigor. However, it did not take long for me to realize that my assumption was far from correct. In reality, my students arrived in the course with widely disparate levels of lesson-planning abilities. For instance, my students who were simultaneously enrolled in curriculum/instruction degree programs often had precisely the background knowledge and skills needed to immediately jump into writing lesson plans. Others, however, were taking my course as an elective (not as part of a curriculum/instruction degree program), which meant that they typically did not have the same prior learning experiences around lesson planning as their peers.

Unfortunately, given the fast-paced nature of my course (which is taught in an online asynchronous environment) and the lack of syllabus flexibility, it was impossible for me to dedicate class time to getting all students on the same page in terms of developing foundational lesson-planning skills. However, after a single semester of observing half of my class struggle with the fundamentals of lesson planning while the other half completed the plans

with relative ease, I knew that I needed to make changes to future iterations of the course.

At the same time that I was grappling with how to (a) develop course content that would support my students in acquiring foundational lesson-planning abilities while (b) ensuring that students who already had those skills did not have to undertake remedial work, I was also beginning to familiarize myself with the pedagogical uses of generative artificial intelligence (GenAI). It seemed to me that my teaching challenges were intersecting with a teaching opportunity, although determining how to approach those challenges introduced its own set of difficulties.

One of the toughest aspects of being a teacher educator is navigating the "layers" of my work that come from having students who are themselves also teachers. These layers – the teaching and learning about teaching and learning – while complex, also provide a challenge that I welcome, pushing me to ensure that I demonstrate the pedagogical practices that I ask my students to adopt. So, when GenAI began making waves in the educational world, I asked myself, "How will I develop my own AI literacy, and how will I incorporate that into the courses that I teach? How will I then model my use of GenAI so that students can connect GenAI use with defensible pedagogical practices, and how will I teach them how to use it themselves?" The first challenge I encountered when answering these questions was figuring out what my stance on GenAI in education was in the first place. Some educators argue that GenAI is a panacea for long-standing challenges in teaching and learning, while others contend that it would hollow out the very thinking processes that lead to true understanding. But where did I fall in this debate?

Wading through these questions led me to the conclusion that GenAI should be used to address persistent problems of practice in ways that augment (rather than replace) learning. In this way, I saw an opportunity for my use of GenAI to dovetail with the challenge of equipping students with lesson-planning background skills (while being limited by an inflexible syllabus). My plan moving forward became to frame GenAI as a teaching assistant who could help me better support my students.

To get started, I took the following steps:

1. I first built my own GenAI literacy by experimenting with different large language models (LLMs) and reading about how to effectively construct prompts.
2. Then, I began exploring online resources that provided quick tips on how educators could use GenAI to address a variety of classroom challenges.
3. Next, I learned how to "teach" GenAI specific information about best practices in lesson planning (following the approach that is expected in my course), as well as a set of success criteria that I would use to evaluate the effectiveness of the components of a lesson plan.
4. Finally, I had GenAI create examples of good *and* bad lesson plans that I could then ask it to critique based on the success criteria it had learned.

Once I had developed my own skills with GenAI, I created a "background skills" module with

various activities for students to complete (if they needed to). The first activity asked students to review brief readings and videos explaining what GenAI is and how it can be used to support teaching and learning. Subsequent activities were much more interactive, all containing screencasts of myself modeling how students could use GenAI to cultivate foundational lesson-planning skills. On one of the activity pages, I provided a Word Doc containing information about the various components of lesson plans, the purposes they serve, and the criteria each should meet to be successful. Students were asked to read this document, then copy/paste the text into their LLM of choice in order to "teach" GenAI about lesson planning. In my screencast, I showed myself doing this, then asking GenAI to create practice quizzes with a variety of item types that would assess my knowledge of the provided information (including explanatory corrections if I responded incorrectly).

Another activity provided students with several sample lesson plans that they could review to try to determine whether the plans were "high quality." In this activity's screencast, I modeled teaching GenAI the success criteria for a lesson plan (based on how my students would be scored on the rubric for our course), then asking GenAI to critique each of the samples based on those criteria. The activity then prompted students to follow that process in getting feedback on the components of their own plans (and encouraged them to think about how they could similarly use GenAI with their K-12 students).

By partnering with GenAI in this way, I was able to better support students in my class who were not prepared to jump into lesson planning at the start of the semester. I also ensured that I was not asking students who already had lesson-planning skills to complete activities for content that they had already mastered. This "teaching partnership" with GenAI has paid dividends, as I observed improvements in students' lesson-planning skills over the last few semesters. With students' feedback, I continued to refine the background skills module, making updates to target areas of need that were identified by students' input and by my own evaluations of their lesson plans.

The upshot of this approach to using GenAI was a distinct improvement in student learning outcomes. When assessing students' lesson plans, I consistently saw evidence that students' use of GenAI had supported them in honing their abilities to craft better lessons. For example, I received far more lesson plans where learning goals were focused on what cognitive skills students should employ (e.g., synthesizing multiple sources) rather than on what students would be doing (e.g., working with partners); where selected instructional strategies were aligned to learning goals; and where formative assessments were woven seamlessly throughout the day's plan.

Using GenAI allowed me to be more responsive to the varied readiness levels students had for engaging with course content at the start of the semester. By embedding modules into the course that showed students how to use GenAI to support the acquisition of background knowledge and skills, I was able to teach more effectively and better support students in achieving major course goals. I intend to continue refining these modules and exploring ways in which similar modules could be embedded into other courses, knowing that the more "teaching assistants" one can have, the better.