Teacher-Centered AI: Building a Trustworthy, Transparent, Teaching-Savvy Sidekick

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Roadmap

- Problem & Why it Matters
- Method: Why Self-Study?
- Four findings: Inquiry Cycles 1–4
- The PBNJ Workflow
- Implications for Learners
- Link to Handout Resource + Paper Pre-print (*Journal AI*) + Evidence Trained Chatbot (EL)

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Problem and Why it Matters

- Students with disabilities spend 80% of time in gen ed classrooms [1, 2]
- Differentiated instruction (DI), adapts content, processes, and products to learner readiness, interests, and needs [6, 7]
- DI is endorsed by teachers but hard to implement consistently (time, admin load, fidelity) [12, 13, 14].
- Early-career teachers underuse DI vs. veterans [22, 23].
- 90% of teachers experiencing burnout cite paperwork [25]
- Generative AI could help planning—but ethics, accuracy, and feasibility are concerns.

"I would not use AI for differentiated lesson planning."

Can we craft a human-centered AI prompting workflow for DI planning support that is…

acceptable, productive, discussable and improvable?

Method: 14-Week Self Study

- Participants: 5 preservice + 2 faculty; weekly recorded meetings.

- Design: 4 iterative cycles over 14 weeks.

- Data: Literature review, prompts, outputs, journals, transcripts.

- Analysis: Dialogic theme building; no formal coding

- Ethics: Explicit power-sharing. No REB required.

Why Self-Study?

- Classroom teaching is a "private activity."
- Improvement to private activities requires a confrontation between tacit, implicit, and private practices and theory, research, explicit rationale, and external expectation [45, 46, 47].
- Dialogue and interactive analysis and theory building [44, 48] enabled public/private confrontation AND a rich discussion about AI use within the affordances and constraints of the complex environment of a classroom.

Yielded: Conclusions about how educators think, feel, and make judgments when operating privately to engage AI for assistance with planning.

Cycle 1: Ethics and Trust are Central

- Identity/virtue ethics overrode duty ethics .

- Confident but inaccurate AI outputs led to feelings of being misled.

- Perceived devaluation/replacement fears dampen adoption.

"It completely made-up curriculum expectations!"

"It presented this [inaccuracy] with total confidence" she noted. "No hedging, no 'approximately.' That's what felt manipulative"

- Even detailed, thorough prompts → impractical, de-contextualized lessons.

- Feasibility gaps (timing, supervision, logistics); lack of flow.

- Conclusion: lesson planning relies on human 'context alchemy.'

"...I think I've learned that all [T.A. tools] can fair job at creating an introductory jumping off point for a topic, even if you've given the AI [adequate] background."

"Only if there is some human oversight. AI does a fair job feel like they're the first lesson of a topic, even if you've given the AI [adequate] background."

"Outputs felt alien and odd"; "all of the lesson plans that AI tools create feel like they're the first lesson of a topic... but fails to deliver a product that teachers could use to reduce workload."

- Start with a tiny 'Break Glass' prompt to reduce friction and get moving.

- Shift from one-shot to iterative 'Jam Sessions.'

- Human exercises agency, judgement, and care.

"A good teacher knows the child, just go back and forth to evaluate, create a lesson plan rather than fight, saying okay I don't take its lesson plan"

Table 5: Examples of AI Output that Supported Teacher Learning

AI Suggestion	Teacher Adaptation	Learning
"Start with video clip on big questions?"	Used video but connected to prior lessons and knowledge.	Videos are sometimes easy to find and add valuable visual support to a lesson.
"Use timer for 'Spot the Difference' game"	Removed timer as it rushed collaborative learning but did give clear instructions for timing.	Pay attention to timing when facilitating DI. Give clear information and frequent reminders in your instructions.
"Make 6 groups and give each one a different plant."	Brought plants, but only three and just passed them around.	Having tangible examples can bring a lesson to life.
"Make 5 different worksheets to engage MLL learners, learners with difficulty spelling, learners with a preference for drawing…"	Made 2 worksheet options and allowed one group to present out loud.	Small adjustments can be made to meet the needs of a wide range of learners.

Cycle 4: AI as Critical Friend

- Back-and-forth surfaced blind spots, fostered reflection, and supported learning (timing, EF supports, challenge ceiling).

- Built confidence and planning fluency; reduced cognitive load.

- AI supplements—not replaces—human collegial support.

"…it gave me guiding questions. It was like having a colleague point out what I might be forgetting."

"it was always helpful in pointing out blind spots — [such as] questions we might not have thought to include or [an awareness of] where our own understanding ends…"

PBNJ: A Human-Centred Prompt Framework

P - Set the Persona: critical-friend

B — Break Glass with a tiny starter

J — Jam iteratively: test, adapt, simplify; you select what sticks.

Grade 5 Lesson Plan: Photosynthesis — What If Plants Disappeared?

Big Idea: Plants use sunlight, water, and air to make food — a process called photosynthesis — which gives living things oxygen and energy to survive.

Learning Goals
By the end of this lesson, students will:
1) Identify the inputs (sunlight, water, carbon dioxide) and outputs (oxygen, glucose) of photosynthesis; 2) Represent the process in one of several formats; 3) Explain why photosynthesis is important to life on Earth

Materials
Three real classroom plants; Blank paper, out of order diagram cut-out pieces

Lesson Sequence (7 min)

1. Hook — Story: "A World Without Green"

A World Without Green?
Imagine waking up one morning and the trees are gone. The grass is gone. Flowers, bushes, vines — vanished. No trees to climb. The world looks... different. At first, you think: "Cool — no more yard work!" But… there's no fruit in the fridge. No cereal. No bread. Even the animals are acting weird — because their food is gone, too. Days later, people get busy planting. We need plants to live. Without plants, we can't eat. We can't breathe. We can't live.

Discussion Prompts:
What do you think would disappear first if there were no plants? How do plants help us breathe and eat? What questions do you have about how plants work?

2. Meet the Classroom Plants (5 min)

Pass around 3 real plants; Give each plant a name (e.g., Sunny, Leafy, Captain CO2); Prompt students to look closely and make observations: What do you notice? What might this plant need to survive?

3. Mini-Lesson (10 min)

Show anchor diagram on the board; Teach inputs: sunlight, water, carbon dioxide; Teach the outputs: oxygen and glucose
Sentence frames for ELL support:
- "Plants take in ___, ___, and ___."
- "They make ___ and ___."

4. Differentiated Student Tasks (25 min)
Students choose one of three ways to demonstrate understanding:
1. Draw It: Create their own labeled diagram; 2. Sequence It: Put diagram pieces in correct order on a mat or page; 3. Move It: Put pieces in order *and* create a movement or gesture for each step

Success Criteria (post on board):
- Know order of 3 inputs and 2 outputs
- Understand why it matters to humans

5. Wrap-Up & Reflection (5–10 min)

Volunteers share diagrams, sequences, or movements; Reflect as a class: "Which part of the plant's job surprised you?" or "How does knowing this help us care for plants?"

Implications for Learners:
Acceptable & Powerful DI Lesson Planning Support

- A quick, easy "Break Glass" start + preservation of teacher agency and judgement + reframing of AI as a dialogic partner (not the boss) = teachers who are *willing* and *able* to use AI for lesson planning.

- A discussable, replicable, and improvable way to use AI.

- More differentiation in lessons at school, with more creative options and varied resources.

STEP 1: **SET THE** **PERSONA**	In Step 1, "Persona," you will give the AI a specific role to play. Telling the AI to act like a "critical friend" helps set the tone for the conversation. It encourages the AI to challenge your ideas, ask questions, and suggest alternatives rather than just agreeing with you. This makes the interaction feel more like co-planning with a colleague and helps you learn new things.
STEP 2: **BREAK GLASS**	Teachers are often tired at the end of a day and may feel overwhelmed by the prospect of lesson planning. Even if you're using AI, you may not know how to get started or worry that you need input every single detail in order to generate a useful lesson. This can create stress, pressure, and writer's block… and it isn't necessary! In Step 2, "Break Glass," you break through these challenges and get started. Instead of frontloading everything, you begin with a short, simple prompt that names the topic, grade, and one or two key details. Think of it like "breaking the glass in case of emergency" — it's a quick, low-pressure way to generate a starting point. The goal isn't to produce a perfect lesson right away, but to give the AI a general idea of what you're working on. The AI will probably respond with a ton of ideas.
STEP 3: **NAME YOUR** **PLAN**	The AI will give you a lot of ideas in response to your Break Glass prompt. In Step 3, you start to steer the process even more by choosing a few interesting parts of the output and naming your plan. It is important that YOU decide the direction of the lesson, because YOU know what's happening in your classroom. The goal is to be fully in charge of the direction of the planning, so your lesson feels human, feasible, and coherent and not alien, disjointed, and odd.
STEP 4: **JAM WITH AI**	Step 4 is where the real learning happens. You may find that going back-and-forth with the AI — like "jamming" with a bandmate — is the most useful part of the process. By asking small questions, considering gaps, refining ideas, and sharing concerns, you can gradually shape lessons to fit your classroom, your students, and your teaching style. Jam sessions are not about accepting everything the AI suggests. They're about making choices: keep what works, ignore what doesn't, and adapt ideas so they make sense in your classroom. Used this way, the AI acts like a critical friend — pointing out blind spots, suggesting alternatives, and nudging you to notice opportunities for improvement – and you remain in control.
STEP 5: **GO OFFLINE**	You may want to run your lesson plan by a human critical friend after you've used the PBNJ workflow. This can be very helpful if your lesson covers content that you're unfamiliar with – a quick check to confirm that you're on the right track. Also, human-human critical friendships can be rewarding and will support your mental health at work. Keep in mind that human-human critical friendships can take a while to develop. It can be hard to share and accept feedback, and trust may grow more slowly than you think. You can *simulate* critical friendship using AI, but the best learning will happen when you take a risk and jam with other sensitive, knowledgeable, responsive humans.

STEP 1: SET THE PERSONA (P) Tell the AI to act like a helpful, critical friend for lesson planning. It will offer suggestions and point out elements you might have overlooked in your differentiation strategy	**Reflection in Action:** *What kind of help do I need right now? How can I set up this AI conversation to get the most constructive feedback?* **Sample Prompt:** *"In a moment, I will give you some info about a lesson I'm planning. I would like you to act as my critical friend while I plan a differentiated lesson. Please challenge my assumptions, suggest alternatives, and help me identify what I might be missing, especially for students with diverse learning needs."*
STEP 2: BREAK GLASS (B) Break through your initial worry about lesson planning and get started! Input a few minimal or rough ideas. It doesn't have to be perfect – just give the AI a rough idea of what you are working on.	**Reflection in Action:** *Do I feel confident about this lesson? Do I have a good sense of what I want students to know, do, or understand at the end? What do I know about my students' diverse needs right now?* **Sample Prompt:** *"I want my 5th graders to learn the inputs and outputs of photosynthesis. I have several ELL students, two with ADHD, and a few who are already reading at high school level. I am worried about keeping everyone engaged. Where should I start?"*
STEP 3: NAME YOUR PLAN (N) Use the AI's initial response to stimulate your thinking and build confidence. Draft a first version of the lesson—just jot down the basics. If you feel insecure about a certain aspect, ask the AI for help.	**Reflection in Action:** *Have I taught this kind of lesson before? Was I successful? What did I learn? When I think about teaching this lesson, what am I worried about? What potential problems might arise?* **Sample Prompt:** *"Based on your suggestions, here is my draft: Start with a visual diagram, use hands-on plant investigation in small groups, provide sentence frames for ELL students, and offer choice in either redoing a mild or spicy diagram of input/output. What am I missing for differentiation?"*
STEP 4: JAM WITH AI (J) Engage in a step-by-step back-and-forth to build your lesson. Take control and be in charge – you know much more about your class than a bot! AI will act like a critical friend – give suggestions and ask questions. Focus on what resonates for you but be open to learning and improvement.	**Reflection in Action:** *Am I overwhelmed by the output? Can I ignore what isn't useful and only focus on what resonates for me? Can I incorporate ideas that may be new to me? Am I open to improvement?* **Sample Prompt:** *"For my student with Autism, large groups are overwhelming. How can I modify this lesson to work for everyone?" OR "My advanced learners finish early and get bored. I only have 45 minutes and limited lab materials. What adjustments can I make?" OR "How can I prevent this lesson from becoming chaotic while still meeting everyone's needs?"*
STEP 5: GO OFFLINE Review to ensure goals are met, the plan is feasible, and differentiation supports all student needs. Consider jamming with a human critical friend for more guidance.	**Reflection in Action:** *Does every student have a pathway to engage and succeed? Will all pathways feel respectful and engaging? Will I adequately teach new skills and concepts? Will I know, and will they know, if success has been achieved by lesson end? Are there any students who might still be left out or any unintended difficulties?*

Resources

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Paper + Handout: www.activatedlearning.org

Evidence Trained Chatbot: https://innoved.consulting/EL

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