

# The Architect and the Engine: Ethical AI Scaffolding in the 6-12 Classroom

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**OBJECTIVE:** Demonstrate the rationale and use of ***Magic School AI*** custom chatbots to improve student performance on process-based assignments.

# Growing Up with the Machine

- I was born in 1972 and grew up with the first home computers, learning to program in BASIC in some of the first computer labs for secondary school
- This perspective reveals what technology is truly for: expanding human capacity, not replacing it
- Generative AI does not possess consciousness, intent, or independent thought; it is a sophisticated pattern-prediction engine
- Understanding this distinction helps us move past AI anxiety and toward intentional, ethical classroom integration
- More on what AI is and is not [here](#)



# The New Demands on Tool Makers and Tool Users



- Recent concerns about screen time in grades 6-12 are valid; AI should mean more intentional cognitive engagement, not passive consumption
- Every major technological leap demands more from us, not less
- You must become a deliberate tool maker, designing the boundaries and guardrails that protect student thinking
- Teaching your students to be critical tool users begins with you curating what AI can and cannot do in your classroom

# Purpose-Built vs. Open-Ended AI

- The crucial paradigm shift: do not unleash students onto open-ended tools like Chat GPT to write essays; this leads to shortcuts and academic dishonesty
- Purpose-built chatbots are custom bots engineered for one specific assignment only, explicitly programmed to limit and restrict the kinds of assistance students receive
- The AI is locked into a pedagogically safe sandbox designed by you, the teacher
- This approach transforms screen time into a dynamic, cognitive workspace where students remain the primary thinkers

# Setting the Foundation and Target Outcomes

- Before you ever touch an AI tool, excellent teaching must happen first in the physical classroom
- Start with your own writing (or process-based) assignments, rubrics, **content** and **academic** vocabulary explicitly taught to students
- AI does not replace initial instruction; it scales and reinforces what you have already taught
- End with students guided through the process at their own pace, receiving only the specific feedback and support you have intentionally designed



# The Metacognitive Shift for Teachers



- To build a purpose-built chatbot, you must do immense metacognitive work deconstructing your own assignment
- You cannot program a bot to gatekeep student thinking if you have not explicitly mapped out what that thinking looks like
- Turn to a neighbor and map out a typical process-based assignment you give: What is the exact critical thinking the student must do independently? Where do students usually get stuck, and where would a hint keep them moving?
- Take 5 minutes to discuss with a partner, then we will share examples as a group

05:00

# The Anatomy of a Custom Chatbot

- Your realizations from the Turn and Talk discussion translate directly into prompt code that programs the chatbot behavior
- The backend of a purpose-built AI tool allows you to set specific instructions, knowledge boundaries, and response formats
- A great purpose-built prompt handles 8 core metacognitive pillars that ensure the AI behaves as your aligned co-teacher
- These pillars are organized into two phases: The Pedagogical Scope and The Instructional Context

# The Metacognitive Prompt: Phase 1 - The Pedagogical Scope

- **Work Requirements:** Clearly define the assignment's length, structural parameters (**especially the order of steps in the process**), and final format so the AI knows the finish line
- **Independent Student Thinking:** Explicitly state what the AI is forbidden from doing, such as writing sentences, thesis statements, or hooks for the student
- **Allowed Chatbot Assistance:** Define the precise boundaries of its help, such as asking probing questions or providing anonymous examples of a strong final product
- **Output Expectations:** Script how the chatbot should format its responses, including tone, length, and how it should end with a single actionable question



# The Metacognitive Prompt: Phase 2 - The Instructional Context



- **Context of the Assignment:** Explain where this specific task fits into the larger unit or curriculum so the AI reinforces your instructional sequence
- **Instruction Already Provided:** Tell the chatbot what you have already taught in class so it uses the same terminology and builds on prior knowledge
- **Materials Provided:** Paste or upload the rubric, mentor texts, or assignment sheets directly into the AI's knowledge base so it scores or guides accurately
- **Abilities of the Students:** Tailor the reading, writing, and cognitive complexity specifically to your grade level, scaffolding differently for a 6th grader versus an 8th grader

# The Student Experience

- The result of combining all 8 pillars is a disciplined tool that keeps students actively writing and thinking
- The chatbot greets students with a welcoming message that frames its specific purpose and boundaries
- Students receive targeted guidance that moves them forward without doing the thinking for them
- Screen time transforms from a passive distraction into a dynamic, cognitive workspace where the student remains the primary architect of their own learning

# Reflection and Next Steps

- Take a moment to reflect: What is one assignment in your classroom that could benefit from a purpose-built chatbot?
- What are the three most important boundaries you would need to program into that bot to protect student thinking?
- Consider how this approach aligns with your existing instructional goals and your students' learning needs
- You now have a framework to move from passive screen time to intentional, purpose-built AI scaffolding



## Resources



# The Tool Makers



- AI is not thinking; we are
- Computers have always required human intentionality and strict programming to be truly useful
- By stepping into your role as a deliberate tool maker who designs purpose-built AI guardrails, you protect student thinking and scale your instructional reach
- You model ethical, responsible technology use by design, showing students that the most powerful tools are those deliberately constrained to serve a specific human purpose

# Questions and Discussion

- What questions do you have about designing purpose-built chatbots for your assignments?
- How might this approach change the way you think about AI in your classroom?
- What barriers or concerns do you anticipate, and how can we address them together?
- Thank you for engaging in this conversation about ethical, intentional AI scaffolding in secondary education
- Here are the [key concepts](#)