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# The Small Teaching ChatBot

## An Experiment in AI Literacy

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## A Conversation

- This presentation describes an ongoing experiment.
- Questions are welcomed at *any point*. Your input will help us improve the project.
- We will have plenty of time for open discussion at the end.

## For each scenario, would it be acceptable for students to use AI for formally assessed writing in your course?



1. **Idea Generation:** Give me 5 possible theses for a paper based on this assignment prompt.
2. **Planning:** Create an outline for my paper assignment based on the following thesis.
3. **Research Support:** Read and summarize these potential sources in a paragraph each.
4. **Structuring:** Improve the organization of my draft.
5. **Feedback:** Based on my draft and the rubric, provide feedback on how to improve my essay.

## Questions

- What skills are lost in each of these scenarios?
- Will those skills evolve or become less important in an AI future?
- What skills might be gained?

## My Starting Point: AI Skepticism/Resistance

Positive educational experiences fuel *growth* in learners. That growth expands their potential by opening their minds to new ways of thinking or acting, providing new opportunities, and laying down pathways to further growth. The most effective experiences point toward that future growth.

## JOHN DEWEY EXPERIENCE & EDUCATION

The great educational theorist's most concise statement of his ideas about the needs, the problems, and the possibilities of education—written *after* his experience with the progressive schools and in the light of the criticisms his theories received.

## AI as a Form of Mis-Education

Some educational experiences stop or limit growth by robbing learners of skills or knowledge that would further their growth, such as removing productive struggle or limiting the creative potential of their thought.

Every experience  
lives on in further  
experience.

John Dewey

Experience and Education (1938)

# AI Supporting Growth

The use of AI in writing might support the growth of writers who struggle with certain parts of the writing process, either because of fixed barriers or because of lack of training.



# Questions and Concerns

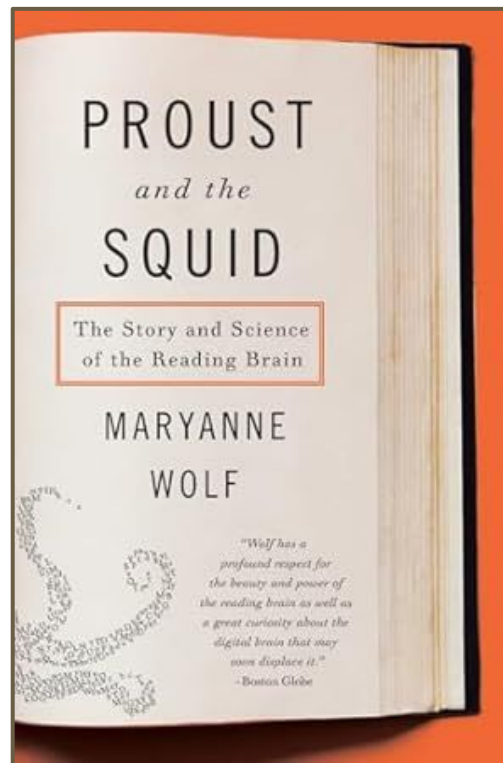
**Driving Question:** Could an AI chatbot offer the type of help to faculty that was promised in the book *Small Teaching*: manageable strategies based on research on how humans learn.

**My Concern:** If faculty received “teaching tips” from AI, divorced from the full reading context, would they miss the opportunity to to learn more about the learning process—and hence to grow as teachers?



# Learning from the Reading Process

“The secret at the heart of reading: the time it frees for the brain to have thoughts deeper than those that came before.”



# ■ The Book's Strategies for Promoting Growth

- Introduction: Story
- In Theory: Core Theory and Evidence
- Models: 1-3 pages for *each* model
  - Discipline-based example, personal examples, variations on a model.
- Principles
- Quick Tips ← Small Teaching AI?
- Conclusion

# Research Team Head

OUR MISSION

Ron Metoyer, Associate  
Provost for Teaching and  
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Engineering



# Lead Researcher

Si Chen is a postdoctoral researcher at the Lucy Family Institute for Data & Society and with Notre Dame Learning. Her research focuses on AI in education and human-computer interaction, emphasizing how emerging technologies influence educational equity and accessibility through human-centered approaches.



# **DISCLAIMER!!!**

I have no formal training in computer science. Forgive, correct, or question me about any of the details of the programming. I will let you know when I don't know, which will likely be most of the time.

# | The Credibility Problem

An academic audience will want credible solutions that come from vetted resources. How can we convince them that the solutions that an AI teaching bot would offer?

“Retrieval-augmented generation (RAG) is an AI framework for improving the quality of LLM-generated responses by grounding the model on external sources of knowledge to supplement the LLM's internal representation of information.”

IBM Research

## **| Some Possible RAG Sources**

- *Small Teaching*
- *Small Teaching Online*
- Activity-Based Learning
- Major CTL Website Resources

(Also Disclaimer #2)

Consider implementing the "Collaborative Storytelling" activity. This fun and creative strategy is effective for team building and ice-breaking. Here's how you can do it:

**Divide into Groups:** Split the class into small groups of 4-6 students each. Ensure a mix of personality types and backgrounds to promote diversity and interaction.

**Provide a Prompt:** Give each group a starting sentence or prompt related to your subject area. This should be broad enough to allow creativity but connected to course themes.

**Story Building:** Each student takes turns adding a sentence or two to the story. Encourage them to build on what the previous person contributed. Set a timer for 10-15 minutes to keep them focused and engaged.

**Sharing:** Once the time is up, have each group share their completed story with the class. You can do this by having a volunteer read the story aloud or through a brief skit if students are comfortable.

**Debrief:** Finish with a class discussion on the themes that emerged and how they relate to course content. Use this as a springboard to introduce course objectives and expectations.

This strategy promotes creativity, encourages listening and communication skills, and helps students start building relationships in a relaxed environment. Adjust the complexity of the prompt based on the students' level and the subject matter.

Active learning strategies that involve collaboration can greatly enhance student engagement, as well as lay a strong foundation for community building within the classroom. According to research on active learning, collaboration encourages students to exchange ideas, improves their problem-solving skills, and develops a sense of belonging and accountability. These approaches are particularly effective on the first day, as they break the ice and promote group cohesion right from the start. By involving students in meaningful interactions early on, educators can establish a positive and supportive learning environment.

One effective first-day strategy is the "Collaborative Learning Puzzle" activity:

**Preparation:** Create a content-related puzzle or problem that can be divided into several sections or pieces. Ensure that each piece has a meaningful contribution to the overall solution.

**Formation:** Divide the class into small groups, assigning each group a different piece or section of the puzzle. For instance, in a chemistry class, each group could be given a different element or principle to explore that connects to a broader concept.

**Group Work:** Allow each group to work collaboratively to understand and summarize their section. Encourage them to use creative methods, such as diagramming or drawing, to visualize their piece of the puzzle.

**Sharing Phase:** Have each group present their findings to the class, explaining how their piece fits into the overall concept. Encourage active listening and questions from their peers to foster engagement.

**Completion:** Conclude with a discussion on how all the sections come together, emphasizing the interconnectedness of knowledge and the importance of collaboration.

This activity not only reinforces the course material but also instills a sense of community among students, showcasing the power of collective effort to solve complex problems.



## Questions from Round One(-ish)

- How many responses should the STBot give?
- Does the user need or care about introductory or concluding paragraphs? How long should those be?
- How much logistical detail does the user need?
- What kind of context does the STBot need to offer the most relevant and helpful suggestions?
- Can we point the user back to the source of the recommendation?

## Two Solutions

- 1) The process begins with some questions from the STChatBot:
  - Years of teaching
  - Discipline
  - Course Level
  - Goal
- 2) The STChatBot asks whether the user wants more ideas or more information about its recommendations.

**Who Is The Real Audience?**

# Live Training

Five recorded consultations with graduate students, post-docs, and faculty members.

Edited transcripts were analyzed and became part of the training data.



## Notes from the Live Trainings

- The consultee was talking 50-75% of the time in a 30-45 minute consultation.
- 50% of my talking time was asking questions, especially trying to understand context and asking for elaboration.
- Recommendation often came in stages—an initial simple solution, further discussion, and then additional ones.

# The Limitations of the AI

- The process of asking questions gave me time to think of possible solutions. The slow pace of the conversation prompted more reflection and thinking.

*This also proved true for the consultee. Most of them began to propose their own solutions, and our conversation often fully developed their own solutions.*

# The Limitations of AI

- Most of the consultees had either learned or intuited their way into good teaching practices. They doubted their abilities, and sought or welcomed reassurances.

*We trained the STChatBot to use comforting phrases like “That’s a very common problem,” but users won’t have the same level of confidence or emotional connection to the reassurances of the STChatBot.*

# The Limitations of AI

- In several cases, the consultation opened up new opportunities for connection or support to the consultee. This included requests for further help and resources.

*The willingness of the consultee to pursue further help emerged both from the emotional connections and from the awareness of local and professional resources that had been vetted by the expert.*



## What *Could* a Teaching-Oriented ChatBot Do?

- Offer help to a potential user when resources or time constraints make an in-person consultation impossible.
- Offer anonymous guidance for teachers who might feel restrained, for any reason, from speaking to a human.
- Remind experts of a wider range of solutions than the ones that are available to them.
- Inspire teachers to seek out the original sources upon which it has based its recommendations.

## My Takeaways on the STChatBot

- Teachers with novice or medium-level awareness of AI could benefit from engagement with the STChatBot.
- Expert teachers who are power users of AI will see little benefit beyond what they can achieve with general tools.
- The STChatBot would provide the most benefit to faculty developers to expand the scope and reasoning of the recommendations they give to faculty.

# Who Learned the Most?

“Bridging the AI Adoption Gap: Designing an Interactive Pedagogical Agent for Higher Education Instructors.”

Si Chen, Reid Metoyer, Khiem Le, Adam Acunin, Izzy Molnar, Alex Ambrose, James Lang, Nitesh Chawla and Ronald Metoyer

The 26th International Conference on Artificial Intelligence in Education (AIED 2025).